

INNO-Policy TrendChart — Policy Trends and Appraisal Report

AUSTRIA

2008

PREFACE

Innovation is a priority of all Member States and of the European Commission. Throughout Europe, hundreds of policy measures and support schemes aimed at innovation have been implemented or are under preparation. The diversity of these measures and schemes reflects the diversity of the framework conditions, cultural preferences and political priorities in the Member States.

PRO INNO Europe is a new initiative of Directorate General Enterprise and Industry which aims to become the focal point for innovation policy analysis, learning and development in Europe, with a view to learning from the best and contributing to the development of new and better innovation policies in Europe. Run by the Innovation Policy Directorate of DG Enterprise and Industry, it pursues the collection, regular updating and analysis of information on innovation policies at national and European level.

The **INNO-Policy TrendChart** serves the 'open policy coordination approach' laid down by the Lisbon Council in March 2000. It supports organisation and scheme managers in Europe with summarised and concise information and statistics on innovation policies, performances and trends in the European Union (EU). It is also a European forum for benchmarking and the exchange of good practices in the area of innovation policy.

The INNO-Policy TrendChart products

The INNO-Policy TrendChart, previously TrendChart on Innovation, has been running since January 2000. It now tracks innovation policy developments in all 27 EU Member States, plus Iceland, Norway, Switzerland, Croatia, Turkey, Israel, Brazil, Canada, China, Japan, the USA and India. The INNO-Policy TrendChart website¹ provides access to the following services and publications, as they become available:

- a database of innovation policy measures across 39 countries;
- a news service and related innovation policy information database;
- a 'who's who' of agencies and government departments involved in innovation;
- annual policy monitoring reports for all countries covered;
- an appraisal of the Lisbon National Reform Programme (NRP) and innovation by Member State (new separate publication in 2008);
- an annual synthesis report bringing together key points in the INNO-Policy TrendChart.

This document has been prepared within the framework of an initiative of the European Commission's Enterprise and Industry Directorate-General, Innovation Policy Development Unit. Official responsible: Cesar Santos (cesar.santos@ec.europa.eu).

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The report covers the period from September 2007 to September 2008. This year's report provides an overview and analyses on two focus themes: (1) policies in support of creativity and Innovation, and (2) support of innovative start-ups including gazelles.

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¹ See: <http://www.proinno-europe.eu/index.cfm?fuseaction=page.display&topicID=52&parentID=52>

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Executive Summary

1. Introduction: Main Recent Trends in the National Innovation System

Statistics Austria estimates a 2.54 % increase in research and development (R&D) expenditures in 2007 relative to the gross domestic product (GDP), against 2.43 % recorded in 2006. The performance of the innovation system of Austria is above the European average, but the country remains in the group of 'innovation followers'. According to the European Innovation Scoreboard (EIS, 2007), Austria occupies the eighth position in the ranking of the Summary Innovation Index (SII) of the EU-27, and has improved its position by one rank, after dropping from fifth place in 2005. However, differences between ranks 7 to 12 are very small, and Austria's overall innovation index is close to those of its peer countries (i.e. Belgium, Canada, France, Iceland, Ireland, Luxembourg and the Netherlands). Notably, Austria's overall position has been improving over the past five years relative to the EU average.

Both GDP growth and employment have been developing very positively in recent years. Driven by growth and investment, the GDP growth rate for the year 2007 was 3.4 % (3.3 % in 2006) in real terms, and was not only above the EU-27 average of 3 % in 2007, but also above the growth rates of Belgium and France (also in the group of innovation followers). The country's unemployment rate lies at 4.4 % and has been following the buoyant economic activity of the past few years. At 3.2 %, only the Netherlands had fewer people unemployed in 2007 (Eurostat figures) in the same group as identified by the EIS.

While both the country's position in the EIS and innovation policy itself are subject to fierce debate among policy makers and economists, more standard economic development figures seem, at least, partially decoupled from the discussion about innovation policies. At the federal level, the positively evaluated 'National Reform Plan' set a general framework that includes research, development and innovation. However, the linkages between its major policy lines and their implications on institutional structures are not always clear, which is why the need for a comprehensive overall growth strategy at the federal level still seems to persist.

The Austrian innovation system can be described by a well-balanced set of strengths and weaknesses, which are clearly reflected by the EIS. While Austria scores well in fields like intellectual property (e.g. patents, numbers of community trademarks, industrial designs) and knowledge creation (e.g. R&D spending), there are shortcomings in innovation drivers linked to framework conditions such as human capital (e.g. tertiary education, lifelong learning etc.), applications comprising innovation success and innovative entrepreneurship consisting of small and medium-sized enterprise (SME) policies, venture capital and entrepreneurship.

2. Major Innovation Challenges and Policy Responses

In order to improve its innovation performance, Austria has to overcome the boundaries in its human capital base² and in the availability of its venture capital³. The former refers mainly to tertiary education indicators. In particular, the number of science and engineering (S&E) graduates is low, and universities are underfinanced from a perspective relative to Austria's GDP per capita. Incentive structures are still subject to discussion, which impedes quality enhancements. Thirdly, Austria's industrial structure is in parts persistently conservative and its R&D performance is dominated by single industries (Reinstaller and Unterlass, 2008). *Inter alia*, a lack of competition and overregulation particularly in parts of the service sector, upholds structural change⁴.

² See for instance Leibfritz and Janger, 2007 or OECD Country Note 2008, <http://www.oecd.org/dataoecd/12/51/40172495.pdf>.

³ See 'Research and Technology' Report 2008, forthcoming.

⁴ See for instance Aiginger et al, 2006 or Leibfritz and Janger, 2007.

Challenge 1: Deficits in human capital — remaining issues despite progress

While several indicators related to skills and education are sound (e.g. youth education attainment level), certain structural deficits in the human capital base of Austria are well documented (e.g. OECD, 2007; EIS, 2007). These typically refer to the share of population with tertiary education, or to the low number of S&E graduates. Today's weaknesses in human capital formation stem at least partially from the emphasis on a primary and secondary vocational education system which provided the country with human capital during its successful catching-up phase (e.g. Krueger and Kumar, 2003.)

The ongoing discussion and number of initiatives show that human capital formation is being addressed and discussed. For example, the 'research dialogue' ('Forschungsdialog') addresses the future of Austria's tertiary education and research landscape. Furthermore, there currently are trials of comprehensive schools that do not separate pupils at age 10. Moreover, there is an initiative concerning life-long learning. If there is mutual agreement between employers and employees, educational sabbaticals for 3 to 12 months are possible. During this period employees receive fictitious unemployment benefits and social insurance.

However, opinions about how to improve the country's human capital base are quite diverse and the discussions are heavily biased by ideology, particularly for the secondary school system. As a result, a number of issues remain open. At the university level, the discussion should not and does not only refer to the sheer number of graduates, but also to the quality of the education and research system as a whole. Discussion points which remain open are the financing of, and free access to, universities and the incentive systems of scientific staff.

Challenge 2: Venture capital

Despite numerous strengths and good development in many indicators, Austria's performance is especially poor in one indicator: venture capital (VC). The availability of early stage risk capital (i.e. seed and start-up private equity) as a percentage of GDP should be 4 to 10 times larger when compared with countries of Austria's peer group (EIS, 2007). This problem greatly affects the Austrian innovation system because the availability of risk capital is a precondition to many start-ups, firm restructuring and the growth of highly innovative SMEs. Moreover, risk capital has three economic functions (see Peneder, 2006). Firstly, through their specialisation, venture capitalists are able to close a finance gap that is related to asymmetric information. Secondly, through maximising their return on investment in a market with strong asymmetric information, they invest in high-risk projects only. Thirdly, they create a value-added through the management expertise that they typically provide to the firms in which they invest. Thus, a strengthening of the VC market may not only contribute to overcoming Austria's structural paradox, but also address market failures and directly increase growth.

The weakness has been addressed by policy makers through instruments of for instance the Austrian investment agency and promotion bank (Austria Wirtschaftsservice, awsg). In late 2007, framework conditions in Austria changed with the adjustment of the once generous SME finance act ("Mittelstandsfinanzierungsgesetz alt") in order to adhere to European state aid regulations ("Mittelstandsfinanzierungsgesetz neu"). The new act, which is often regarded as an interim solution, faces fierce criticism and the industry calls for a completely new regulatory framework. Furthermore, a draft of a relating new act, the "Kapitalmarktstärkungs- und Innovationsgesetz, KMSiG", has undergone a consultation process, in which the proposed act has faced substantial criticism.⁵

Challenge 3: Competition as part of the framework conditions

As attested by the EIS 2007, Austria's innovation output in general is lower than the outputs in peer countries. In particular, this refers to structural variables, such as the share of employment in high-tech services, but to a lesser extent to exports in high-tech industries. An explanation of this lag lies in Austria's slowly changing industry structure, which is still dominated by medium-, high-tech sectors.

⁵ For relevant documents see http://www.parlament.gv.at/PG/DE/XXIII/ME/ME_00207/pmh.shtml

Austria's R&D performance in manufacturing is heavily concentrated in a single sector, and driven by a statistical artefact in that public research organisations and funding agencies are allocated to the business sector, since they are categorised as limited companies (Reinstaller and Unterlass, 2008).

These shortcomings can be attributed to several problems in the framework conditions, which may involve many aspects including path dependency, human capital, venture capital, etc. However, overregulation in knowledge-intensive services, and a lack of competition in some industries are typically mentioned among the causes for slow structural change in both economic strategy documents (e.g. bm:wa, 2008 or Aiginger et al, 2006) and papers analysing the national innovation system (e.g. OECD, 2007). Only hesitantly have policy makers been addressing competition as part of economic and innovation policy. However, high inflation in the price of convenience goods (and thus perceived inflation) have recently led to an emergence of the discussion about competition as a means to potentially reduce inflationary pressures. Furthermore, subsidies as a share of GDP amounted to 3.5 % in 2007, more than three times the average of the EU-27. Yet, there is no discussion about possible distortions of market outcomes that relate to these interventions.

Summary table: innovation challenges, policy responses and impact

Challenge	Relevance of policy response	Evidence of impact
Quality of universities and S&E graduates	4	3
Venture Capital	4	2
Competition policies	1	1

Policy response ranking scored from 1 to 5: (1) No specific measures addressing the challenge (possibly a debate but no evidence of any real policy development); (2) Policy development under way to respond to challenge (policy debate or design launched, e.g. announced in National Lisbon Reform Plan, etc.); (3) Specific measures existing for some time but insufficient to respond fully to challenge; (4) Existing measure plus one or more newly launched measures (during last 18 months); (5) A comprehensive set of measures which potentially responds fully to the challenge.

Evidence of impact scored from 1 to 5: (1) Trend for indicators has worsened since measure(s) was introduced; (2) No observable change in trend since measure(s) was introduced; (3) Too early to appraise (measures introduced in last 24 months); (4) Trend for indicators has improved since measure(s) was introduced; (5) Evaluation or study indicates that the measure(s) has had clearly a positive effect on innovation performance in the country.

3. Innovation Governance and Policy Trends

The Austrian government supports the 3% Barcelona target, which, however, would require another strong increase in spending over the next two years, since the currently estimated ratio for 2008 is 2.63%. However, Austria's innovation system has always been weak at taking strategically orchestrated actions, and the institutional setting creates a certain fragmentation between ministries and more or less "independent" agencies. The new structures established in 2007 led to the evolution of a broad based debate on research and innovation. For instance, the Ministry for Science and Research launched the "research dialogue", a platform discussing issues relevant to Austria's entire research landscape⁶. Likewise, the "future dialogue" (Zukunftsdialog) was a governmental think tank which discussed research, technology and innovation policies, educational issues and structural deficits in November 2007.

Furthermore, the BMVIT commissioned in February an evaluation of the entire Austrian innovation funding and promotion system. A Wifo-led consortium aims at the systemic understanding of public intervention in research and innovation processes, as well as the production of a list of instruments, sorted in terms of their efficiency, in order to improve Austria's innovation system. On the one hand, this evaluation seems to be a chance for Austria to clarify its structures based on a far-reaching evaluation and policy document. On the other hand, a danger is that the eventual outcome might feed into another softly formulated strategy paper with unclear implications.

4. Conclusion: Future Actions and Opportunities for Innovation Policy

⁶ For further information in German please see: <http://www.forschungsdialog.at/>.

While the innovation system exhibits strengths in innovation inputs, it still experiences weaknesses in its human capital base. This applies especially to the number of S&E graduates, the low funding and quality of the universities, and the lack of strategy within the secondary school system. The picture for the framework conditions is equally mixed: while intellectual property rights are strongly enforced in Austria, the availability of risk capital, extensive subsidies and the overregulation of certain service industries hampers productivity growth and innovation⁷.

Indicators show that Austria's innovation performance — when compared with other European countries — has been very positive in the past 15 years. From being in a catching-up process, it is currently trying to shift its position to that of a technological front-runner. Although accompanied by the establishment of an extensive R&D promotion system, this change is not yet reflected by its institutional structures; a strategically orchestrated overall approach and the required funds to reach the 3 % Barcelona target are still not evident. A number of institutional problems are being addressed in the ongoing evaluation of the entire Austrian funding and innovation promotion system. This overall assessment of the entire national innovation system is an opportunity to identify its strengths and weaknesses, which may eventually be used for a re-positioning of the institutional setting.

⁷ See for instance EIS 2007; Leibfritz and Janger, 2007.

1. Main Trends and Challenges in the National Innovation System

1.1 Recent Trends in Macroeconomic and Market Developments

Austria has a small open economy with strong ties to Germany, Italy and the new Member States. It is among the wealthiest in the EU in terms of GDP per capita and has a low unemployment rate. Value-added growth is driven primarily by investment and trade surplus. The country shares borders with several new Member States which are currently in an economic catching-up process. Thus, strategy papers (e.g. Aiginger et al., 2006) point out that enhanced innovation performance, as well as faster structural change towards more technology and skill intensive industries are preconditions for maintaining Austria's good position in economic indicators.

In this first chapter we sketch Austria's macroeconomic situation by looking at the GDP, the labour market, inflation, innovation and environmental indicators (see Exhibit 1). In our analysis we use both data by Eurostat and the EIS, the Organisation for Economic Cooperation and Development (OECD), as well as more qualitative analyses (e.g. 'European Competitiveness' Report 2007 or 'Wifo White' Paper 2006).

- Austria's GDP per capita is among the highest in the EU. This also holds for private consumption per head and the ratio of investment to GDP. In 2006, only Ireland, Luxembourg and the Netherlands had a higher GDP per capita in purchasing power parities than Austria⁸. However, the international economic crisis also affected the positive Austrian economic development, which was driven mainly by dynamic investment and trade surplus figures. While the economy grew 3.4 % in 2007 (EU-27: 2.8 %; OECD: 2.7 %), the two main economic research institutes Wifo and IHS forecast real GDP growth for 2008 of 2.3 % and 2.2 %, and 1.4 % and 1.9 % for 2009, respectively.
- Austria's labour market situation — also as an indicator of social cohesion — is better than the European average. For instance, the employment rate as a major indicator for the labour market situation in Austria averaged 68.6 % for people aged 15 to 64 in 2007. This figure was above the EU-27 average of 65.4 % for the same year. Yet, there is a substantial gender gap: 78.4 % of all men, but only 64.4 % of all women, were employed. Looking at the segment of people aged 55 to 64 the average employment rate was 38.6 % in 2007, with again a significant gender gap (49.8 % for men versus 28 % for women). Furthermore, the Austrian employment rate of older workers is below the employment rate of 44.7 % of the EU-27.
- At 4.4 % Austria's unemployment situation is better than in the EU-27, which averages 8.2 %. Within the EU, Austria thus ranks fifth after the Netherlands (3.2 %), Denmark (3.7 %), Cyprus (3.9 %) and Lithuania (4.3 %). The youth unemployment rate in Austria (age group 15 to 24 years) was 8.6 % in 2007 and thus below the European average (EU-27) of 15.4 %. Austria ranks fourth in the EU, after the Netherlands (5.9 %) Denmark (8.2 %) and Lithuania (8,5 %).
- In recent years, inflation has roughly been at the average European levels. In 2007, Austria's consumer price index (CPI) was at 2.2 % (2.6 % in 2006), which is slightly below the EU average of 2.4 % (in 2006: 2.3 %). With 2.4 % in 2007 and 2.2 % in 2006, similar increases of consumer prices have been monitored in the Euro area. However, inflation rose to 3.2 % in the first quarter of 2008, which has led to discussions about how to counteract inflationary pressures.

⁸ For further information see:

http://epp.eurostat.ec.europa.eu/pls/portal/docs/PAGE/PGP_PRD_CAT_PREREL/PGE_CAT_PREREL_YEAR_2007/PGE_CAT_PREREL_YEAR_2007_MONTH_12/2-17122007-DE-AP.PDF.

- In innovation indicators, Austria is in an advanced medium-range position in the EU according to the EIS. This reflects its specific economic structure with few large-scale domestic corporations and a dominance of low- and medium-tech firms. High-tech enterprises in the information and communication (ICT) or the biotechnology sectors with often very high R&D intensity are relatively scarce. Reaching the Barcelona target seems to be unrealistic for Austria, despite generous public spending on R&D, which already meets the subsidiary goal of 1 % of GDP.
- In education indicators, Austria performs well in secondary education. However, indicators of tertiary education show that Austria has a smaller share of people with tertiary education, S&E degrees, and it also spends less money on tertiary education than comparable, medium-advanced countries. In Austria, 18 % of the adult population aged 25-to-64 years are qualified at the tertiary level. This figure is well below the OECD average of 26 %. The graduation rates continue to grow, but are increasing more slowly than the OECD average; also science and technology (S&T) graduates are still below the OECD average (OECD, 2007). Greater efforts at human capital formation — especially in the tertiary education sector — are necessary if the high per-capita income position and the country's competitiveness, based on skills, are to be maintained (see, for instance, 'Wifo White' Paper, 2006 or EC, 2007).
- In an international comparison, Austria's environmental standard is relatively high, but pressures on environmental quality are rising at an above-average rate. Austria's earlier position as an 'environmental pioneer' has been lost. Greenhouse gas emissions are relatively low, but the trend since 1990 has been significantly worse than the EU average. Compliance with the Kyoto agreement also seems unlikely. Commercial road traffic has expanded above average and has largely contributed to the rapid increase in greenhouse gas emissions. While Austria's energy intensity is comparatively low, electricity consumption has outpaced GDP growth over the last years.

Exhibit 1: Comparable indicators of economic performance

Indicator	National performance		EU 27 average	
	2002	2007	2002	2007
GDP per capita in PPS (EU-27=100)	127.9	128.5*	100	100*
Real GDP growth rate (percentage change previous year)	0.9	3.4	1.2	2.9
Labour productivity per person employed (EU-27=100)	119.3	120.8*	100	100*
Total employment growth (annual percentage change)	-0.1	1.2 [^]	0.3	1.5 [^]
Inflation rate (average annual)	1.7	2.2	2.1	2.3
Unit labour costs (growth rate)	-0.2	-1.1	-0.5	-0.8*
Public balance (net borrowing/lending) as a percentage of GDP	-0.5	-1.4 [^]	-2.5	-1.6 [^]
General government debt as a percentage of GDP	65.8	61.7 [^]	30.3	61.4 [^]
Unemployment rate (as a percentage of active population)	4.8	4.7	8.9	8.2
Foreign direct investment intensity	1.5	2.4 [^]	1.3	1.8 [^]
Business investment as a percentage of GDP	19.2	19.5 [^]	17.3	18.2 [^]

Source: Eurostat - Structural Indicators and Long-term Indicators <http://epp.eurostat.ec.eu.int>
 Key: EU-27 average; ([^]) latest available year (2006); (:) not available; (*) forecast

1.2 Recent Trends in the National Innovation Performance

The macroeconomic performance of a country has many causes, which are often related to innovation, but may also be driven by other factors. When discussing the link between innovation and macroeconomic performance, one has to analyse how innovation affects the growth rate. In order to gain deeper insight into the drivers of economic activity, growth accounting conducted in the EU-KLEMS project paints a rather clear picture by splitting up growth into five components: capital, labour, energy, services and materials. This approach considers both quantitative and qualitative changes in inputs, and portrays so-called multi-factor productivity as a proxy for innovation.

The findings for Austria (Peneder et al, 2007) show that between 1990 and 2004, the average annual growth of total real value added amounted to about 2.38 percentage points, which is an average position. This average growth splits into +1.33 percentage points contributed by capital output growth, +0.46 percentage points by labour output growth, and +0.85 percentages point by multi-factor productivity growth (as well as minor reallocation effects). Thus, the contribution of non-factor related technological change, measured in terms of multi-factor productivity, accounted for more than one third of total economic growth, which is a low figure for a country like Austria with a high GDP per capita.

If the quality effects of the shift in factor utilisation towards higher-value production factors resulting from factor-related technological change are included, the average annual contribution to growth stands at +1.49 percentage points, corresponding to a share of 63 %. Hence, qualitative changes have been responsible for close to two thirds of real value added growth since 1990.

The Austrian Government defined investment in innovation as a central strategy to cope with unemployment. Indeed, Austria appears to have improved its innovation performance in the past decade. Based on low to medium R&D-intensive industries and with a structural bias towards SMEs, the Austrian economy has first approached, and recently exceeded the EU average in R&D intensity.

In particular, R&D expenditures have increased substantially since 1998. According to Statistics Austria, they will amount to 2.6 % in 2008 (2.55 % in 2007). The financing of R&D has seen a substantial increase of R&D spending in the enterprise sector (48.6 % in 2008; 46.7 % in 2007). Public funding accounted for 35.5 % in 2008 (2007: 37.4 %). Compared with 2007, the investments in R&D by companies will increase by 10.2 % and public funding will rise by 8.9 %. These developments were also marked by a high and stable level of financial inflows from foreign sources, i.e. parent companies of multinational subsidiaries in Austria (15.5 %).

The substantial increase in R&D spending was triggered by a number of factors. Firstly, the broadening of access and the increase in the generosity of the indirect funding schemes (tax allowance) motivated companies to investigate the scope and size of their R&D activities and thus to report all R&D investments, even only marginally related activities. Secondly, having received funding via the tax allowance may have increased the willingness to declare R&D expenditures in the official R&D survey. Coupled with improved statistical coverage of R&D performing companies this substantially contributes to the increases in R&D spending; Thirdly, the broad variety of measures taken since 2000 has also covered most potential R&D investors and thus increased the likelihood of investing in R&D (for an evaluation of the impact of increases in direct and indirect funding see Falk – Leo, 2004).

The results of the European Innovation Scoreboard 2007 rank Austria in eighth position. Thus it has improved its position by one rank, after dropping from fifth place in 2005. Austria is in the group of 'innovation follower' countries whose innovation performance is above the EU average but below the 'innovation leader' countries. Other EU countries in this group are Belgium, Ireland, France, Luxembourg and the Netherlands. Its innovation performance has improved over the last five years relative to the EU average.

Comparing Austria's EIS score to the EU average, we find that the country performs well at knowledge creation and intellectual property, which reflects the rather high R&D expenditures as well as the use

of the legal system to protect innovation. However, Austria performs badly at 'applications' due to its low share of the high-tech sectors, and the rather positive figures of innovating SMEs and organisational innovation in the segment 'innovation and entrepreneurship' are overlaid by the poor availability of venture capital. Innovation drivers are around the European average, because of strengths in life-long learning and youth education attainment balance problems in tertiary education and S&E graduates (see Exhibit 3; the blue line represents the score of Austria in the respective groups; the grey field is the European average⁹).

The following list summarises the EIS-indicators where Austria performs well (the figures in brackets relate the respective Austrian performance to the EU25 average of 100):

- 32.4% of Austrian SMEs innovate in house (150)
- 17.8% of Austrian firms receive public funding for innovation (198)
- Registered community trademarks: 221.5 (205)
- Registered community designs: 208.8 (191)

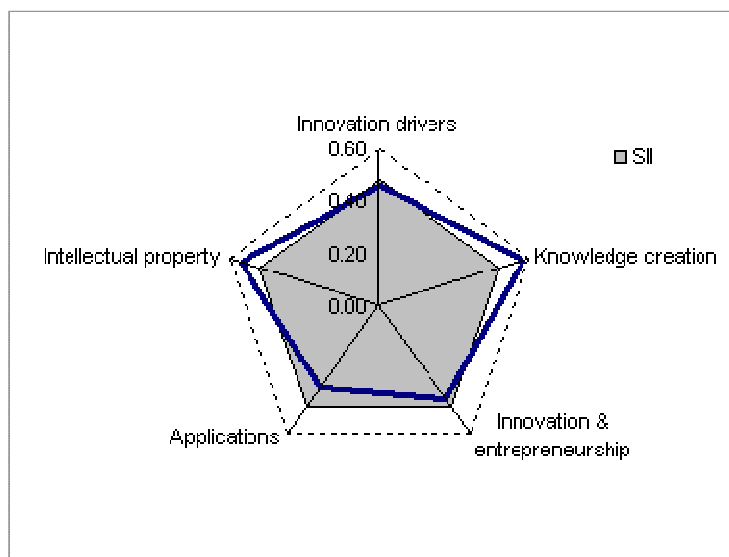
This reflects the traditional strengths of the Austrian innovation system, especially the strong basis of innovating SMEs which have good access to the public funding infrastructure. Furthermore, Austria seems to have made good progress in improving the cooperative culture within the enterprise sector as well as between science and industry.

However, Austria has several structural deficits that are also reflected in the indicators of the Innovation Scoreboard (the figures in brackets relate the respective Austrian performance to the EU average of 100 %):

- The number of graduates in S&E: 9.8 % (76 %);
- 17.6 % of the population hold a tertiary education degree (77 %);
- Early stage venture capital as a share of the GDP amounts to only 0.003 % or the GDP (6 %).

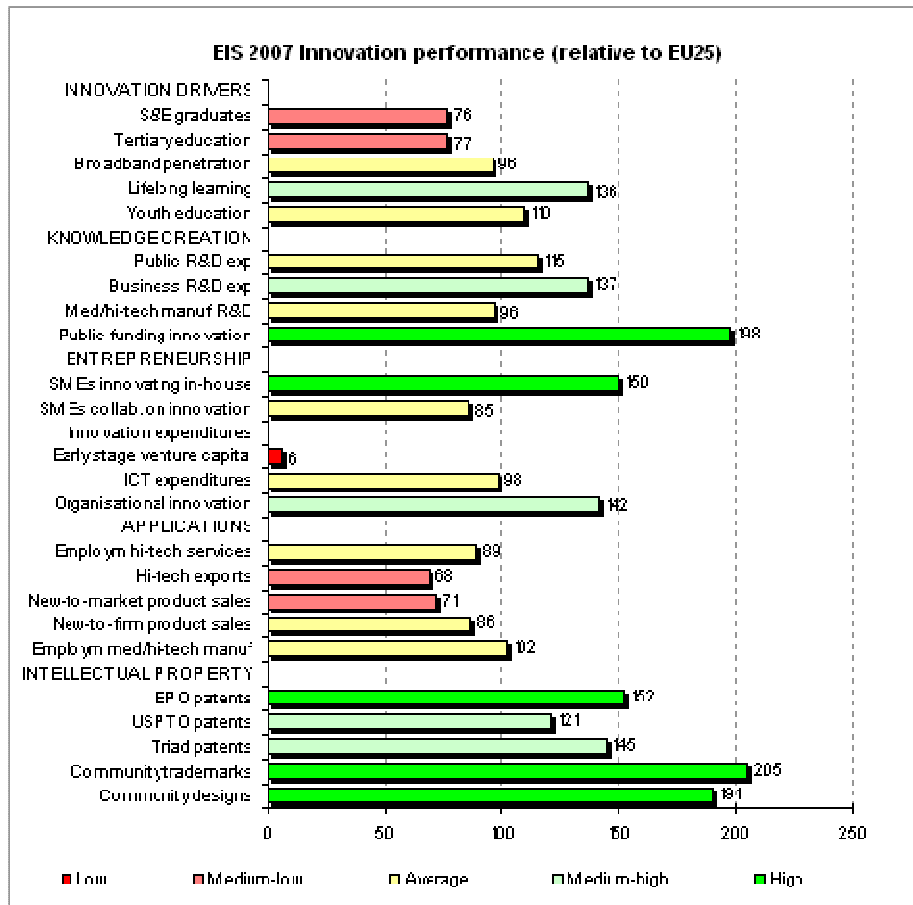
Concerning the Lisbon Strategy of the European Union, all three problem areas were integrated in Austria's national reform programme to fulfil the requirements. The 'National Reform' programme includes five areas dedicated to innovation, ranging from increasing budgets for R&D to human resources. The problem areas identified by EIS are also addressed and measures are proposed to cope with them.

Exhibit: 2: European Innovation Scoreboard: Austria versus the EU average



⁹ For details see: <http://www.proinno-europe.eu/index.cfm?fuseaction=page.display&topicID=306&parentID=51>

Exhibit 3: European Innovation Scoreboard: Results for Austria



1.3 Identified Challenges

Innovation policy seems somewhat separated from the design of other economic policy. The first two challenges — human resources and venture capital — were also addressed in the Assessment of National Reform Programmes by the European Commission with a mainly positive appraisal of Austrian initiatives. Competition has recently been gaining relevance in the public discussion, but requires further attention.

In order to improve its innovation performance, Austria has to overcome constraints to its human capital base (see for instance Leibfritz and Janger, 2007 or OECD Country Note 2008¹⁰). This refers mainly to tertiary education indicators. The number of S&E graduates is especially low, and universities are underfinanced in relation to Austria's GDP per capita. Also incentive structures are still subject to discussion, which impedes quality enhancements.

Secondly, the availability of venture capital and private equity, especially early stage risk finance is far below the average of comparable countries (see 'Research and Technology' Report 2008, forthcoming). This hampers high-risk projects, which are often found in skill intensive industries. Hence, the poor availability of venture capital also decelerates the pace of structural change.

Thirdly, Austria's industry structure is in part persistently conservative and Austria's R&D performance is dominated by single industries (Reinstaller and Unterlass, 2008). *Inter alia*, lacking competition and overregulation — especially in parts of the service sector — uphold structural change and the growth of high-tech industries (see for instance Aiginger et al, 2006 or Leibfritz and Janger, 2007).

Furthermore, the service sector is neglected in the NRP report, and in the Austrian innovation policy it has not been a topic until recently, when the innovative potential of the sector has been discovered. For this reason only a few measures that target services are currently established (e.g. the funding for strategic innovation in SMEs by the City of Vienna).

Challenge 1: Deficits in human capital — remaining issues despite progress

The general shift in employment towards more skill-intensive industries is also evident in Austria. Shift share analysis shows that between 1991 and 2001, in relative figures, almost all new jobs were created in the high-skilled segment of the labour market. Approximately two thirds of the change occurred within existing industries, and the remaining third could be attributed to the growing importance of new industries. The share of medium qualified employment has been stagnating, and low skilled labour has faced sharp declines that were accompanied by a decreasing share of low-tech sectors in the Austrian industrial structures (Leo et al, 2006).

Skills shortages have been repeatedly reported (e.g. by the Federation of Austrian Industry or the Wifo White Paper), especially in industries that require labour specialised in S&E. Furthermore, these industries are often located in cluster regions (e.g. steel industry in Upper Austria or the automobile industry in Styria). Hence, not all regions are equally affected by skill shortages.

Such skill gaps can be seen as an adjustment problem, arising if demand increases (or supply decreases) faster (slower) than labour supply (demand). Secondly, skill gaps can also stem from a suboptimal mix of skills in the economy (EC, 2007). Given the slow adoption of Austria's education system and the large share of arts students in tertiary education, both aspects seem to matter. This causes a problem in both the supply and demand side of innovation. While there might be a lack of sufficiently skilled people who push innovation, demand for new products and services might be low due to difficulties handling the novel solutions, which again might have feedback on the potential of being a lead market for certain technologies where this latter problem applies.

¹⁰ The OECD country progress note for Austria is online at <http://www.oecd.org/dataoecd/12/51/40172495.pdf>.

While several indicators about skills and education are positive (e.g. youth education attainment level), certain structural deficits in the human capital base of Austria are well documented (e.g. OECD, 2007; EIS, 2007). These typically refer to the share of population with tertiary education, or to the low number of S&E graduates. Today's weaknesses in human capital formation stem at least partially from the emphasis on primary and secondary vocational education system which provided the country with human capital during its successful catching up phase (e.g. Krueger and Kumar, 2003).

Policy makers are responding to arising problems in various ways. For example, the 'research dialogue' ('Forschungsdialog') addresses the future of Austria's tertiary education and research landscape¹¹ (Interest for research is being sparked at an early age in the 'research goes school' programme ('Forschung macht Schule'¹²). Furthermore, there also are life-long learning initiatives in the form of 'training sabbaticals' ('Bildungskarenz'). If employers and employees find an agreement, educational leave was recently made possible for sabbaticals of 3 to 12 months. In this period, employees receive a remuneration amounting to the unemployment compensation they would be entitled to, and are also social insured. Furthermore, currently there are trials of comprehensive schools that do not separate pupils at age 10.

The low participation of women weakens the availability of human resources (with only 9 %, Austria has the lowest rate of female industrial researchers in Europe). The Council for Research and Technology Development defined the topic 'Human Resources' as a central field for intensified political action. It published a study on this topic in April 2008¹³.

Measures have been started to raise female participation in R&D: 'Excellentia' (AT_100) has been created to ease the access of women to professorships at universities. The goal is to increase the amount of female professors by 40 % by 2010 (now, only around 10 % of university professors are women). fForte (AT_64) is a bundle of initiatives to boost women's share in technical and natural sciences at universities and in enterprises; the programme has been extended to 2012. Similarly, the initiative 'FEMtech women in research and technology' seeks to increase the share of women in skill and R&D intensive industries.

The ongoing discussion and many initiatives show that human capital formation is being addressed and discussed. However, opinions about how to improve the country's skill base are quite diverse and the discussions are often heavily biased by ideology, which especially holds for the secondary school system. As a result, a number of issues remain open, and it remains unclear if improvements will be achieved.

At the university level, the discussion should not and does not only refer to the sheer number of graduates, but also to their quality of the education and research system as a whole. Discussion points involved and that remain open are the financing of and free access to universities, and the incentive systems of scientific staff. Notably, there is an ongoing evaluation of the Austrian university system which may provide a basis for changes of the regulatory framework.

Challenge 2: Venture capital

Despite numerous strengths and the benign development in many indicators, Austria's innovation performance is particularly poor in one EIS indicator: venture capital (VC) and private equity (PE). Austria's favoured way of financing business is still the classic bank loan, and banks are less willing to take a risk. The availability of early stage risk capital (i.e. pre-seed and start-up private equity) as a percentage of GDP should be 4 to 10 times larger when compared with countries of Austria's peer group of medium-advanced countries (EIS, 2007). This problem greatly affects the Austrian innovation system, because the availability of risk capital is a precondition to many start-ups, firm restructuring and growth of highly innovative SMEs.

Risk capital has three economic functions that are all of particular relevance to innovation (see Peneder, 2006). Firstly, through their specialisation, venture capitalists are able to close a finance gap

¹¹ Extensive information about the 'research dialogue' is available at: <http://www.forschungsdialog.at/>.

¹² <http://www.forschungmachtschule.at/>.

¹³ http://www.rat-fte.at/UserFiles/File/080229_Endbericht_HumanressourceninOesterreich.pdf.

which is related to asymmetric information. Secondly, via maximising their return on investment in a market with strong asymmetric information, they invest in high risk projects only. Thirdly, they create a value added through management know-how that they typically provide to the firms they invest in.

Peneder and Schwarz (2006) use a sample of typical VC-backed firms that suggests that particularly knowledge-intensive service industries such as ICT, knowledge-intensive business services and R&D suffer from little VC and PE. Also biotechnology clusters (e.g. in the Vienna region) require a stronger risk capital market. Thus, a strengthening of the VC market may not only contribute to overcoming Austria's structural paradox by increasing the share of knowledge intensive industries in the economy, but it also addresses market failures and directly increases growth.

The weakness in the availability of risk capital has been addressed by policy makers, and many instruments of the Austrian investment agency and promotion bank ('Austria Wirtschaftsservice', awsg) relate to private equity and try to compensate for the underdeveloped private VC market. The measures comprise equity capital guarantees (TC measure AT 15¹⁴), seed finance (AT 3¹⁵) or i2, which is a platform for business angels (AT 4¹⁶). Other direct intervention instruments such as state-backed 'fund of funds' are barely discussed. However, an overall improvement of the availability of VC in Austria is not discernible.

Austria is a capital-intensive country, and therefore the persisting weakness in the availability of PE/VC is fairly surprising. Thus, the focus of policy makers should not be put onto subsidies that evidently have not improved the situation, but rather on regulatory deficits (e.g. Brandner et al, 2007). Notably, framework conditions changed in Austria at the end of 2007 with the adjustment of the once generous SME finance act that granted tax exemptions ('Mittelstandsfinanzierungsgesetz alt'). The Parliament passed an amendment in order to adhere to European state aid legislation ('Mittelstandsfinanzierungsgesetz neu').

While the new law is in line with the 'Community guidelines on state aid to promote risk capital investments in SMEs'¹⁷, the act has been fiercely criticised by providers of risk capital, and even the demise of the already weak situation in Austria has been predicted. Private investors as well as the Austrian Private Equity and Venture Capital Organisation (AVCO¹⁸), a lobby of the VC and PE industry, strongly demanded a fixing of the legal situation that the SME finance act created. However, an amendment of the current legal framework seems unfeasible, which is why the VC industry is demanding a completely new legal solution that is decoupled from the state aid legislation.

Hence, a PE and VC act has been proposed (Kapitalmarktstärkungs- und Innovationsgesetz 2008) that aims at providing a legal basis for venture capitalists that avoids double taxation of profits (company invested in and investment company) without providing loopholes to operative holdings at the same time. It has already undergone a consultation process (11 June through 16 July), in which the proposed act has faced criticism, partly because the proposed reporting commitments are seen as being too high, the maximum holding period of 10 years too short, and a depositary bank was required for its operations¹⁹.

¹⁴ <http://www.proinno-europe.eu/index.cfm?fuseaction=wiw.measures&page=detail&id=7009&CO=1>.

¹⁵ <http://www.proinno-europe.eu/index.cfm?fuseaction=wiw.measures&page=detail&id=8040&CO=1>.

¹⁶ <http://www.proinno-europe.eu/index.cfm?fuseaction=wiw.measures&page=detail&id=6880&CO=1>.

¹⁷ The respective community guidelines are available at: <http://eur->

[lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2006:194:0002:0021:EN:PDF](http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2006:194:0002:0021:EN:PDF)

¹⁸ <http://www.avco.at>.

¹⁹ For relevant documents see http://www.parlament.gv.at/PG/DE/XXIII/ME/ME_00207/pmh.shtml.

Challenge 3: Competition as part of the framework conditions

As attested in the EIS 2007, Austria's innovation output in general is lower than the outputs in peer countries. In particular, this refers to structural variables such as the share of employment in high-tech services and to a lesser extent to exports in high-tech industries. An explanation of this lag lies in Austria's slowly changing industry structure, which is still dominated by medium-, high-tech sectors. Austria's R&D performance in manufacturing is heavily concentrated in a single sector, and driven by a statistical artefact because public research organisations and funding agencies are allotted to the business sector, since they figure as limited companies (Reinstaller and Unterlass, 2008).

These shortcomings can be attributed to several problems in the framework conditions which may involve many aspects such as path dependency, the human capital base, venture capital, etc. However, overregulation and low competition especially in many service industries are typically mentioned among the causes for slow structural change, both in economic strategy documents (Aiginger et al, 2006) and papers analysing the national innovation system (e.g. Leibfritz - Janger, 2007). Knowledge intensive business service industries in particular face entry and growth barriers due to overregulation (bm:wa, 2008, pp 173-175)

Subsidies may also distort competition and preserve economic structures, and there is evidence that they uphold innovation and productivity growth (e.g. Vickers, 2005). Austria's subsidy allocation is very generous. According to Eurostat, Austria's subsidies as a share of GDP amounted to 3.5 % in 2007, by far the highest figure in the entire EU and more than three times the EU-27 (and EU15) average of 1.1 %.

Policy makers have been hesitantly addressing competition as part of economic and innovation policy. However, high inflation figures of petrol and convenience goods (and thus perceived inflation in public) have recently led to an emergence of the discussion about inflation. Competition is seen as a means to potentially reduce inflationary pressures (e.g. Janger, 2008), and economists often see this as a window of opportunity to redesign Austria's competition policies (for a list of reform options in Austria's competition regulation see, for instance, Böheim, 2008).

The ongoing debate comprises the tight regulation of parts of the service sector such as the removal of territory protection (e.g. pharmacies), advertising restrictions (e.g. medical services), and qualification requirements for certain industries, or red tape in public administration (e.g. start-ups). Other competition relevant aspects — for instance, institutional factors like shifting of the burden of proof in antitrust legislation, or competition on the energy market — remain largely unmentioned, and actual policy action is still not perceivable.

However, a new institutional setting for anti trust enforcement has been drafted by the Federal Ministry of Economics and Labour (Wettbewerbsreorganisationsgesetz). Recommendations reflect prior discussions (see for example Böheim, 2008), and comprise for instance the changes of the institutional framework, and investigation powers of the Federal Competition Authority. However, due to missing political consensus of the government parties, the new legislation has not been implemented.

Exhibit 4: Main innovation policy challenges

Description of challenge	Relevant indicators and trends
1. Deficits in human capital	Low number of S&T graduates, low number of women in R&D; measures are taken and structures are subject to fierce debate, but to date there no visible improvement.
2. Venture Capital	Accessibility difficult for SMEs; low volume of venture capital and private equity in general; ongoing discussions about measures and regulatory framework.
3. Competition	The service sector in particular has long been unrecognised as an area for economic and innovation policy; discussions are starting about how to fund

INNO-Policy TrendChart

	innovative service companies as a increasingly important sector of the Austrian economy; subsidies as a share of GDP are very high in Austria, however, there is no discussion about possible distortions of competition and effects on structural change.
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2. Innovation Governance and Policies: Key Trends in Structures and Performance

2.1 The National Innovation Governance System: an Appraisal

At the federal government level, the main governmental players in S&T policy are the Ministry of Transport, Innovation and Technology (BMVIT), the Ministry for Economics and Labour (BMWA), the Ministry of Science and Research (BMWf), and the Ministry of Finance (BMF). The BMWf is responsible for universities in Austria. The former two — and this is where some of the overlap in competencies occurs — are working on research and innovation in the enterprise sector and supporting institutions. The BMF is not directly involved in financing innovation policy, but it plays an important role within the policy system since it governs the allocation of financial resources, and at least implicitly sets standards for designing and monitoring innovation support programmes. Regular discussion on strategy and operational issues around innovation policy topics takes place in the Science Committee and the newly founded Innovation Committee of the Parliament.

Over the last years, ministries withdrew from in-house programme execution as these tasks were shifted towards specialised agencies (e.g. FFG, AWS, FWF, etc.). BMWf and the BMVIT are jointly responsible for the FWF (Austrian Science Fund). AWS (Austria Wirtschaftsservice) and FFG (Forschungsförderungsgesellschaft - Austrian Research Promotion Agency) are jointly steered by the BMWA. These agencies implement on a non-exclusive basis the science, technology and innovation programmes for the ministries.

In an effort to create a body with the power to design long-term strategies for Austrian innovation policy, the Austrian Council for Research and Technological Development was created in 2000. The Government tried to react on a perceived lack of strategic intelligence within the system. As an explicit measure to improve coherence within the system the establishment of the Council sets the starting point for the reorganisation process which was launched in the same year and continues to this day. There is a steering committee including members from the different ministries. The Austrian Council for Research and Technology Development, however, notes a gap in the coordination of innovation policy.

The development of the structural setting in the reporting period is dominated by the elections to the House of Parliament at the beginning of October 2006. Before the election and up to the formation of the Government no major changes to the system occurred. In the coalition agreement the new Government presented ambitious goals for STI which were not really reflected in the operational measures included in this document. At present, it remains to be seen if these statements are binding for the work of the new Government.

The formation of the new Government entailed a further complication in the ministerial setting governing STI in Austria. While the pre-election governance system was already marked by an overlap in competencies and missing coordination, the post-election organisation is even more fragmented as the agenda for education and science was separated and allocated to different ministries (i.e. the Ministry for Education, Science and Culture was split into the Ministry for Education, the Arts and Culture (BMUKK) and the Ministry for Science and Research (BMWf). This change has already created tensions in the system as all ministries are now striving to demarcate their fields of activity. One outcome of this situation is the still missing information on the overall budget for STI in 2007.

The Austrian Council for Research and Technology Development has been an important player since 2000. The Council succeeded in formulating a strategy up to 2010, but not in creating sufficient momentum to make this strategy binding for the actors in the system. Thus the ministries 'compete' for dominance in specific policy areas instead of coordinating their efforts to improve Austrian STI performance. Overall, the role of the Council has been somewhat weakened as special appropriation

for STI has been retransferred into regular budgets. In the pre-election period, the Council was responsible for recommending the use of these funds. Now they are again under the governance of the ministries.

Overall, the transition to the new structures may reflect political pressure and a need to reshuffle policy focus, but it has also created tensions and friction within the system. The resources bound by these 'internal affairs' are missing in the design of any short-, medium- and long-term policy activities. Consequently, the present constellation does not seem to be suited to improve the overall STI performance of Austria in the years to come.

2.1.1 Main changes in the national governance system

As described above, the system was resettled after the elections in 2006 and with the formation of the new Government in 2007, respectively. Since then, no major changes or readjustments have occurred. In 2007, it became obvious that strategy for innovation and R&D in Austria will no longer be the main competence of the Council for Research and Technology Development. Responsibility for research, technology and innovation policy was claimed by several ministers and even the chancellor himself.

The Ministry for Science and Research launched the 'research dialogue' ('Forschungsdialog'), a platform discussing issues relevant to Austria's research landscape²⁰. The topics discussed are very broad, and come from universities (also of applied sciences), mission-oriented promotion programmes, gender issues to entrepreneurship and skills. Likewise, the 'future dialogue' ('Zukunftsdialog') was a governmental think tank chaired by the chancellor and discussed research, technology and innovation policies, educational issues and structural deficits in November 2007.

Furthermore, discussions at the national level have focused, not on the national innovation system itself, but on specific sectors. For instance, Austria's persistently average position in ICT rankings (e.g. e-readiness index), and its relatively low contributions of ICT investments to growth (according to EU-KLEMS data) — neither of which reflect the country's economic wealth — has sparked debate: discussions about how to improve the Austrian ICT sector have evolved recently. The 'internet promotion platform' (Internetoffensive) is a governmental discussion platform under the patronage of the chancellor and the vice-chancellor. It has produced a strategy paper that contains a list of prioritised policy measures that should give growth impulses to the ICT sector²¹.

Notably, there exist strategy papers and listings of measures to be taken, for instance by the 'broadband consortium', led by the Austrian telecom incumbent (ARGE Breitband²²), an extensive strategy paper by the bm:vit and the telecom regulator RTR — the ICT-Masterplan²³, the recently released 'ICT research strategy' by the Council for Research and Technology Development²⁴, etc. However, an often proposed policy measure, such as a single ICT coordinator, has never been implemented, weaknesses in network quality continue (see for instance Czerny et al, 2006), and a coordinated, overarching ICT strategy is still absent.

2.1.2 Main changes in the regional governance system

There have been no fundamental changes in the regional governance system since the TrendChart Report 2007. In general, it can be stated that in Austria — as a federal state — the importance of regions in supporting and funding research and innovation has been increasing in recent years. The Austrian regions (Bundesländer) have been showing growth in their research supporting budgets, accompanied by the infrastructure required to coordinate and attain public funding. The growing

²⁰ For further information see: <http://www.forschungsdialog.at/>..

²¹ For further information in German see: <http://www.internetoffensive.at/>..

²² <http://www.telekom.at/Content.Node/innovation/ueberblick/arge-breitband.php>.

²³ http://www.bmvit.gv.at/telekommunikation/bekanntmachung/downloads/IKT_Masterplan.pdf.

²⁴ <http://www.ikt-forschung.at/>.

number of persons working in research that support administration illustrates this increase in the regions' relevance of innovation support. Another indication is the fact that the Austrian Government (Bund) undertook a number of research supporting programmes based on the co-funding of the regional administrations.

This trend started in the 1990s where public R&D expenditures of the Austrian state (Bund) increased by 52 %. In the same timeframe the respective expenditures of the regions (Länder) increased by 107 %. Accordingly, regional public R&D expenditures as a fraction of total public R&D expenditures increased from 11% to 18 % in the period 1998–2003. While the increase of regional innovation funding was made possible mainly by funds raised through privatisation, the received money has already been spent and therefore the level of funding may not increase significantly in the future. The regions added EUR 371 million to the state-wide R&D budget in 2007, according to Statistics Austria.

All of the federal states have established agencies to provide support measures for innovation and R&D. Furthermore, there has been a tendency to set up sub-agencies that manage distinct responsibilities at the federal level. This trend has been influenced by the establishment of regional innovation platforms such as competence centres of Kplus or the programme's successor, COMET. However, the main funding agency remains the national Austrian Research Promotion Agency (FFG).

Since this tendency has led to quite a large number of agencies working on innovation support and the allocation of funds, the coordination of these agencies is rather complicated. Many of the federal states began rethinking and redefining the structure of their innovation agencies to improve their coordination.

Coordination between innovation support programmes of the federal states and the Austrian state is mainly driven by the principle of co-funding. For a better coordination, the Council for Research and Technology Development started with the 'FTI Platform Austria: Cooperation Federal States – Government'. Two meetings of this platform took place in 2007, but no concrete results have been communicated.

2.2 Focus and Trends of National and Regional Innovation Policies

2.2.1 The innovation policy mix

Policy making at the regional level is strongly based on the national innovation policy mix. Since co-funding and the implementation of national programmes are core elements of regional policies, the regional strategies are strongly correlated with national programmes. The degree of engagement in innovation policies of regional authorities varies. Some federal states have developed extensive strategy papers, while others have focused on the administrative work of funding the innovation projects of companies.

In Austria, the regional innovation policy is driven mainly by the regional governments (each of the nine federal states (Bundesländer), has its own government (Landesregierung) and parliament (Landtag). The federal states have considerable powers in the field of innovation policy. As a consequence, Austria has seen a regionalisation of innovation policy in recent years. Most Austrian regions developed strategies and mobilised substantial financial resources to implement them.

This development raised the question about how the federal innovation policy interacts with its regional counterparts. No clear model has evolved yet, perhaps because of the seemingly great diversity between the regions. Whereas some regions rather follow a strategy of additionality, others focus their resources on supplementary funding to top up federal funding activities.

With respect to the efficiency of public funding, supplementary funding provided by regions seems problematic. The additionality of total funding is expected to be reduced as funds provided by regions are not likely to have any impact on project size and project orientation. In the end, supplementary funding is first of all seen as reward for investing in R&D activities.

An interesting example of how federal innovation policies can interact with the regions is the 'K-Plus' programme (AT 123²⁵, AT 133²⁶) launched by the BMVIT. The competence centres programme supports the establishment of research platforms bringing together scientific research and innovative firms. Public funding is provided jointly by the federal state and regional government. The aims of the programme and the rules for implementation are set and defined by federal innovation policy sets.

The participation of the regions as co-funding partners in competence centres increases their commitment to the programme and the established centres. AplusB (AT 141²⁷) and REGplus (AT 48²⁸) are other examples of how federal programmes can give regional impulses. AplusB supports the establishment of incubator facilities at universities or other public research institutions. REGplus addresses technology centres and supports competence building and networking activities in the region.

Over the last years, several federal states have begun building clusters and regional technology centres which provide space and support for innovative companies. The main driving force behind the establishment of a cluster policy in Austria was the need to cope with regional structural and economic changes, as well as the emergence of a new understanding of the economy and the role of politics or the state. The focus shifted from supporting single enterprises to establishing networks and using synergies between public institutions, enterprises and education. Along with the policy shift, most federal states created regional innovation agencies or upgraded them. These agencies are 100 % spin-offs of the federal state.

Especially in regions where traditional industry seemed to erode, the cluster idea was and is being seen as a possibility to develop into a reliable concept for regional development. The decision on which technologies the thematic focus of a cluster should lie is, in most cases, based on scientific research and on the strengths of the regional economy. The federal states have not yet tried to build a cluster around a completely new technology. The 'Competence Centre' programme supported the efforts of the federal states to build up clusters (see Trend Chart 2004-2005 for more details).

2.2.2 New or significantly changed innovation policy measures

Only two new policy measures have been launched since the last TrendChart report: innovation cheques and the 'Laura Bassi Centers of Expertise'. Furthermore, the climate and energy fund has changed slightly, framework conditions for researchers from 'third countries' have improved, and the governmental discussion platform research dialogue presented its outcomes in August 2008.

Innovation Cheques

Using the Dutch innovation vouchers as an example, the Austrian Government has launched 'innovation cheques' as a support instrument for SMEs that can be used for consulting services at research institutions and universities. The instrument aims at promoting the share of SMEs conducting R&D (AT 173²⁹).

Laura Bassi Centres of Expertise

In order to promote gender equality in executive positions within collaborative research facilities, six planned competence centres are located at the interface with industry. According to the plans, they will carry out applied basic research in the natural sciences, engineering and technology, i. e. mathematics are included in the programme as well as biology, medicine, chemistry, engineering, architecture and information technology. At each centre, the position of research director will be held by a woman, and women should also be adequately represented in the composition of the research team (included in AT 143³⁰).

²⁵ <http://www.proinno-europe.eu/index.cfm?fuseaction=wiw.measures&page=detail&id=-84&CO=1>.

²⁶ <http://www.proinno-europe.eu/index.cfm?fuseaction=wiw.measures&page=detail&id=-132&CO=1>.

²⁷ <http://www.proinno-europe.eu/index.cfm?fuseaction=wiw.measures&page=detail&id=9383&CO=1>.

²⁸ <http://www.proinno-europe.eu/index.cfm?fuseaction=wiw.measures&page=detail&id=8060&CO=1>.

²⁹ <http://www.proinno-europe.eu/index.cfm?fuseaction=wiw.measures&page=detail&id=9350&CO=1>.

³⁰ <http://www.proinno-europe.eu/index.cfm?fuseaction=wiw.measures&page=detail&id=-283&CO=1>.

Climate and Energy Fund

Aiming for sustainable energy provision, the reduction of greenhouse emissions and the increase of R&D intensities, the Climate and Energy Fund provides financing for innovative projects. Established as a prestigious project of the new Government, the Climate and Energy Fund launched its first call for submissions in April 2008. Under the headline 'New Energies 2020', projects focusing on efficient energy use, sustainable energy and intelligent energy systems will be supported.

New visa regulation for researchers of 'third countries'

Parliament passed an amendment of the law regulating visas to aliens working in R&D and education (including the arts), in both public and private institutions and companies. The new regulation eases access to the labour market for R&D personnel in Austria, as well as their spouses and children. It was made effective on 1 January 2007 and has been a useful support measure to R&D performing firms which are internationally active.

Research dialogue

Launched by the Ministry for Science and Research, the research dialogue is a platform discussing issues relevant to Austria's research landscape for the next decade. The topics discussed are very broad, and come from universities (also of applied sciences), mission-oriented promotion programmes, gender issues to entrepreneurship and skills.

Exhibit 5: New Innovation Policy Support Measures

IPM N°	Title	Innovation policy framework category	Organisation responsible
AT 173	Innovation cheques	Knowledge transfer (contract research, licences, research and IPR issues in public/academic/non-profit institutes)	bm:wa, bm:vit
AT 143	Laura Bassi Centres of Expertise	Career development of research personnel (gender)	FFG, bm:wa, fforte
	Climate and Energy Fund	Strategic research policies	bm:lfuw, bm:wa, bm:vit, bka
	Visa regulations for researchers	Mobility of researchers	
	Research dialogue	Strategic research strategies (long-term research agendas)	bm:wf

2.2.3 Trends in innovation policy at regional level

The Competence Centres programmes (AT_23, AT_27) that were launched in 1998 are, according to the responsible funding agency FFG, among the most successful technology policy initiatives in Austria. Today, some 1 500 researchers from science and industry work on jointly defined top-level research programmes at more than 40 centres. The programme played a central role also in regional innovation policy: the centres helped to attract researchers to research clusters outside of the scientific dominant capital Vienna and promoted regions as highly-skilled technology developers³¹.

The 'COMET' programme is the follow up of the K-programmes. COMET aims to further increase the culture of cooperation between science and industry and their joint build-up of research competence and exploitation of results. It supports the building up of competence centres that are based on a top-level research programme jointly formulated by science and industry and offers Austrian regions the possibility to further improve their innovative profile. The first call for applications was opened on 1 October 2007. Beside this follow-up programme, no new initiatives at the regional level have been launched since autumn 2007³².

2.2.4 Focus sub-theme: policies in support of creativity and innovation

In the past few years, the interest of Austrian politics in the creative industries has increased significantly as a result of the economic growth forecasts and the employment potential in this sector. In 2004, about 28 700 private enterprises (including public sector enterprises with private sector trading characteristics) were active in the Austrian creative industries. This corresponds to about 10 % of the total number of Austrian companies (Creativ Wirtschaft Austria 2006).

The connection between creativity and innovation seemed promising as regards the development of new products and services, but also challenging in terms of funding and support structures that still put their main focus on traditional industries. As a consequence, several platforms were formed — some under the initiative of people working in the creative industries themselves (e.g. designers), others by lobbies which discovered the topics creativity and innovation as highly interesting fields for activities.

The following provides an overview of the initiatives engaged in this field:

- 'Design Austria': a representative of Austrian design companies³³;
- 'ARGE creativwirtschaft': a platform, initiated by the Austrian Federal Economic Chamber, aimed at maximising the potential of creative industries by representing companies, institutions, individuals etc. that have a diverse background (e.g. design, multimedia, culture etc.). Not only awareness, but also the development of new instruments focusing on support, networking, national and international collaboration, etc. is on the agenda of the initiative³⁴;
- 'design forum'³⁵ aims at providing a networking platform for firms of creative industries, other companies, policy makers, politicians and the public.

Several studies have been conducted to gain insight into the structures of the expanding field of creative businesses and to produce proposals of how to structure funding for creative innovations. All studies, no matter whether they are focused on regional aspects or the national stance, showed that creative industries are an extremely heterogeneous sector. They are made up mainly of micro enterprises: almost 60 % of companies do not have employees (i.e. they are one-person companies),

³¹ For further information see: <http://www.proinno-europe.eu/index.cfm?fuseaction=wiv.measures&page=detail&id=-84&CO=1> and <http://www.proinno-europe.eu/index.cfm?fuseaction=wiv.measures&page=detail&id=-132&CO=1>.

³² For further information in German see: <http://www.ffg.at/content.php?cid=340>.

³³ <http://designaustria.at>.

³⁴ <http://www.creativwirtschaft.at/>.

³⁵ <http://www.designforum.at/>.

and the average company size (about four employees per enterprise) has been decreasing over time (Creativ Wirtschaft Austria 2006).

According to the Austrian Federal Economic Chamber, almost two thirds of Austrian companies have integrated creative products and services into their trading activities. In particular, there is a strong demand for creative services in industry.

To support the cooperation between enterprises and designers etc., but also between science and creative industries, several programmes were created:

The impulse programme 'Creative economy' is an initiative that offers training and education, financial support as well as awareness programmes³⁶. Thematically, the programme is split up in design, multimedia and music.

- 'Createch' competition, announced by BMVIT in April 2008, promotes ideas to connect creative industries with traffic and logistic technologies and was open to submission until 9 July 2008.
- Departure: a funding organisation and point of contact for people active in the field of the creative industries, established in 2003 by the City of Vienna³⁷.
- SciENCE for creative industries: a call by the Vienna Science and Technology Fund³⁸.

User (customer) driven innovation is not a separate topic in the Austrian policy discussion, since it is typically regarded as being intrinsic to the system, and thus expected to occur anyhow (i.e. it is assumed that there is not a market failure). User driven innovations are therefore not reflected by the (very broad) array of innovation support instruments.

Concerning the broader public, a prize is granted to promote the importance of design: the Adolf Loos Prize for Innovation. It was initiated by the Federal Ministry of Economics and Labour in collaboration with Raiffeisen (a private bank) and the Federal Ministry for Education, the Arts and Culture³⁹.

Nevertheless, the discussion focuses on how to strengthen support for creative industries. 'Creativ Wirtschaft Austria' stresses the following points as being important:

- measures aimed at sensitising the general public or entrepreneurs (in both 'traditional' and Creative industries) or at enabling or facilitating trading activities for creative persons through networking of any kind (e.g. with partners, clients/contractors);
- support for the establishment of companies in creative industries (financial or non-financial), such as within the framework of the German programme 'StartART' — the start-up initiative for arts and culture industries in North Rhein Westphalia;
- instruments aimed at supporting creative industries (or 'traditional' industries) with regard to the development of innovative products attributed to creative industries;
- internationalisation measures support creative persons in the commercialisation of their products abroad;
- there is a wide and diversely heterogeneous field of other financial support measures, ranging from tax relief on certification fees to the support market entry.

³⁶ <http://www.impulsprogramm.at>

³⁷ <http://www.departure.at/>

³⁸ <http://www.wvtf.at/wvtf/>

³⁹ <http://www.designaustria.at/aktuelles/i/adolf-loos-staatspreis-design-2007>

2.3 Innovation Policy and Competitiveness: Main Conclusions

2.3.1 How well does policy respond to innovation challenges?

Enhancing growth through more innovation has become a priority for Austrian policy makers in line with European policies as laid down in the Lisbon Agenda. Austria has increased its R&D spending as a share of GDP over the last 10 years, largely reflecting more business R&D, and targeting a jump to 3 % of GDP by 2010. Innovation activity as measured by output indicators has also improved in various fields, including the number of innovating SMEs. Furthermore, policy instruments and institutions have been improved and a culture of policy evaluation is developing.

However, there are some weaknesses, particularly in general economic framework conditions such as the availability of human capital, or regulatory issues like competition policies or the inadequate framework for venture capital (e.g. Leibfritz and Janger 2007). Discussions about innovation policy note these shortcomings. The current innovation policy puts great focus on direct and indirect subsidies, and the policy mix addresses a large and comprehensive number of issues.

Yet, the ongoing debate only insufficiently addresses regulatory policy as a means for improvement in the critical indicators. While the discussion about future policies encompasses some framework conditions, especially the education and university system, debates fall short in terms of the regulation of competition and availability of venture capital. There seems to be almost no reaction on behalf of policy makers to the two latter points.

Exhibit 6: Summary table: innovation challenges, policy responses and impact

Challenge	Relevance of policy response	Evidence of impact
Quality of universities and S&E graduates	4	3
Venture Capital	2	2
Competition policies	1	1

Policy response ranking scored from 1 to 5: (1) No specific measures addressing the challenge (possibly a debate but no evidence of any real policy development); (2) Policy development under way to respond to challenge (policy debate or design launched, e.g. announced in National Lisbon Reform Plan, etc.); (3) Specific measures existing for some time but insufficient to respond fully to challenge; (4) Existing measure plus one or more newly launched measures (during last 18 months); (5) A comprehensive set of measures which potentially responds fully to the challenge.

Evidence of impact scored from 1 to 5: (1) Trend for indicators has worsened since measure(s) was introduced; (2) No observable change in trend since measure(s) was introduced; (3) Too early to appraise (measures introduced in last 24 months); (4) Trend for indicators has improved since measure(s) was introduced; (5) Evaluation or study indicates measure(s) has clearly contributed to improving performance of country.

2.3.2 Lessons learned from policy evaluation and good practice

The number of evaluations carried out in Austria has been constantly increasing in recent years. However, the heterogeneity of programmes and evaluation approaches, as well as the great number of studies render it difficult to produce a summary of the findings.

A complete list of evaluations and brief summaries of their content can be found below.

Year:	2008	2008
Title:	AplusB Acadmia Business Spin-off Start-up programme — Interim evaluation	Intellectual property at universities - Evaluation of the programme uni:invent (2004-2006)
Commissioned by:	Federal Ministry of Traffic, Innovation and Technology (BMVIT)	Federal Ministry for Science and Research (BMWF), Federal Ministry for Economics and Labor
Evaluator:	inno Germany AG	Joanneum Research: Andreas Schibany, Gerhard Streicher, Brigitte Nones
Description:	AplusB has been set up as a programme to support entrepreneurship by academics. The evaluation states that the programme has reached its goals and the programme management by FFG was professional. Nevertheless, there is potential for improvement: the target group should be formulated more widely (not only researchers from universities and high schools, but in general academics with professional experience) and the exchange of knowledge and experiences between the projects should be intensified.	The evaluation covers the entire first phase of the programme, beginning with 2004 and ending with 2006. The evaluation is based both on a quantitative and qualitative analysis of the effects and results of uni:invent. For the first time, also the inventors were asked for their experiences with the programme.
Language:	German	German
Link:	http://www.fteval.at/files/evstudien/aplusbevaluierung.pdf	http://www.fteval.at/files/evstudien/uniinvent_Endbericht.pdf

Year:	2007	2007
Title:	Evaluation of actions to promote women	Begleitende Evaluierung der Kampagne innovatives-oesterreich.at
Commissioned by:	Austrian Rectors' Conference (ÖRK), Austrian National Union of Students (ÖH), Federal Ministry for Science and Research (BMWF)	Österreichische Forschungsförderungsgesellschaft (FFG)
Evaluator:	Österreichische Qualitätssicherungsagentur AQA, Gudrun Biffi (WIFO), Andrea Löther (CEWS), Christine Roloff	Roald Steiner, Iris Fischl (KMFA); Katharina Warta, Leonhard Jörg (Technopolis); Joachim Bacher (TNS Infratest Communication Research Centre, Hamburg)
Description:	Since the enactment of the University Act (UG) 2002, each university has been responsible as an autonomous institution for developing its own Promotion Plan for Women (Frauenförderungsplan) and for documenting the actions and results	The following report is presented by the Austrian Institute for SME Research, Technopolis Austria and TNS Infratest Communication Research Centre which shows the results of the accompanying evaluation of the campaign http://www.innovatives-oesterreich.at . This

	in performance agreements concluded with the Federal Government. In a two-year procedure, which was based on a self-evaluation by the universities and an evaluation in a peer review process, the stage of development of the promotion of women and gender mainstreaming of 12 Austrian universities were evaluated. The project resulted in recommendations on drawing up 'promotions plans for women' and performance agreements, in an independent assessment of actions to promote women in actual practice, and an overview on the status quo of promotion of women and gender mainstreaming.	evaluation was carried between October 2005 and December 2006 on behalf of Österreichische Forschungsförderungsgesellschaft mbH.
Language:	German	German
Link:	http://www.fteval.at/files/evstudien/Frauenf%F6rderung_Unis.pdf	http://www.fteval.at/files/evstudien/inno_osterreich.pdf

Year:	2007	2007
Title:	High Tech or Not Tech. Vom fehlenden Strukturwandel und anderen Sorgen.	
Commissioned by:		
Evaluator:	Andreas Schibany, Helmut Gassler, Gerhard Streicher (Joanneum Research)	
Description:	Austria lacks a structural change towards high tech is an often heard warning. In order to reinforce the structural change a total conversion of the innovation system as well as the public support system would be necessary. However, the last years have been shown that the Austrian innovation system exhibits an astonishing potential of flexibility and adaptability to the new challenges. The paper shows empirically that no cause for alarm exists.	

Good practice: AplusB - Academia plus Business

Accounting for less than 10 % of all new companies, the start-up activity in Austria's high-tech sectors is generally not very dynamic by international standards. The fact that the number of new companies founded by university graduates and scientists is so small is significant. The AplusB impulse programme therefore aimed to bring about a sustainable increase in the number of innovative, technology-oriented spin-offs from the academic sector.

AplusB supports innovative, technology-oriented spin-offs from the academic sector. The programme funds the so-called AplusB-Centres providing professional support for scientists in the process of turning a good idea into a viable business. This involves not only counselling and assistance during the actual start-up phase, but it also establishes the idea of entrepreneurship more firmly in academic theory and practice.

Nine AplusB-Centres were established in which start-ups are qualified, counselled and coached. These 9 AplusB-Centres initiated 236 technology projects until April 2008; 171 start-ups were founded. The 236 technology projects hold about 180 patents. Approximately 120 partners — among them almost all Austrian academic institutions — were integrated in the programme.

The evaluation published in 2008 was positive. It states that the programme has reached its goals and the programme management by FFG was professional. Nevertheless, there is potential for improvement: The target group should be formulated more widely (i.e. not only researchers from universities and secondary schools, but should also address academics with professional experience in general), and the exchange of knowledge and experiences between the projects should be intensified.

2.3.3 Possible orientations for future policy actions

Firstly and most importantly, the stock human capital needs to be improved. Austria has achieved its relatively high GDP per capita level with a rather low share of tertiary education. Similarly, the relative number of business researchers is also low (and the number of women working in this field even lower), as is the share of the highly skilled workers in services. Considering prospective shifts in labour demand towards high-skilled workers as well as the higher investment in tertiary education abroad, Austria needs to invest more in tertiary education whilst adopting incentive structures at universities at the same time. Increasing the share of workers with tertiary education would facilitate the creation and diffusion of new technologies and raise Austria's growth potential.

Secondly, firm creation deserves a greater focus. While overall firm creation in Austria is average based on an international comparison, there is some evidence that most of the new firms are not very innovative. A major reason could be that entry regulations for limited companies are burdensome in terms of administrative costs, minimum capital requirement and duration of start-up procedures. Furthermore, the fact that venture capital investment in Austria is far below average also suggests a relative lack of innovative activity of newly created firms.

Thirdly, the proposed measures enhancing competition should be implemented eventually. For instance, these refer to barriers of entry in the service sector, in particular in retail (e.g. large outlet regulation, licences and permits, opening hours), liberal professions and railways. Furthermore, network ownership and operation of energy grids should be unbundled, and institutional factors in competition regulation should be clarified (Böheim, 2008). Moreover, the generous subsidy system of Austria may distort competition and incentives to innovate, and should thus be evaluated.

3. Thematic Focus: Support for Innovative Start-ups, including Gazelles

Innovative start-ups are seen as important vehicles for economic growth. Without business conditions that facilitate the creation of business start-ups, the contribution of investment in S&T to innovation and growth will remain limited. New technology-based firms are significant employers of S&E personnel and key actors in the innovation process. These conditions may include well-functioning venture capital markets, regulatory reform to enable greater entry and exit, and a business climate stimulating risk taking in the creation of new innovative firms.

In this section we are therefore investigating the role of policies to support innovative start-ups in the national innovation system.

3.1 General Framework Condition for Innovative Start-ups

In our analysis we distinguish between innovative start-ups and high-growth firms, the so-called 'gazelles'. While innovative start-ups play a significant role in promoting new technologies, they do not necessarily grow. Then again, high-growth firms are indeed innovative *per se* because they would not grow otherwise, not automatically in a technological sense. Firm growth can be triggered by a number of factors, such as the social capital of the entrepreneur, skills of the staff, management, marketing, organisational changes, product or process innovation etc. (for a more detailed discussion see for instance Hölzl – Friesenbichler, 2008 or Rigby et al, 2007). Hence, we split the following discussion into several parts: first we argue that the number of start-ups is comparable with other European countries, but that the amount of fast-growing firms is too low. Briefly mentioning the framework conditions for innovative start-ups, we put focus on the growth friendliness of the entrepreneurial environment, mainly in terms of finance.

Using three different datasets, Hölzl et al (2007) show that entry and exit dynamics in Austria have been increasing over the last decades. Although a final international comparison of start-up figures is currently not possible because of a lack of data, the evidence provided suggests that start-up and survival rates in Austria reflect the levels of comparable EU Member States. This picture is confirmed by the analysis of job creation from start-ups and job destruction from closures: over the past 10 years, some 3.5 % of employees on average have been working yearly in start-ups. Within a period of any given five years, start-ups and closures account for more than 50 % of newly created or destroyed jobs. Looking at firm growth and gazelles, the situation seems to be less positive. Data point to a rather low average growth focus of Austrian companies. Still, this finding is not limited to Austria but applies generally when comparing the situation in the EU with the USA.

The Austrian Government is fostering the entry of innovative and technology-oriented firms through a host of different policies by the promotion agencies FFG and AWSG, the regional branches of the Federal Economic Chamber, the Federal Ministry of Economics and Labour, etc. Besides the general promotion of SMEs and firm creation — brought on by reduced social security contributions and coaching programmes and other support — there is a relatively dense network of technology centres which provides cheap infrastructure and pooled services for new firms (e.g. Leibfritz and Janger 2007). However, the effectiveness of these policies is likely to be diminished due to various obstacles in the creation of innovative firms (see section 3.3 — Integration with other competitive policies below).

Finance is an often cited problem to both potential high-risk start ups and SMEs with growth ambitions. According to the third Community Innovation Survey, the amount of SMEs that are reporting financing shortcomings in Austria is greater than in other countries. Also venture capital investment in Austria is far below the European average. The underdeveloped venture capital market stems from structural inefficiencies in the market and/or a lack of profitable innovative projects, which may point at other problems, such as creativity, human capital etc. As a result, there is an insufficient amount of finance for risky entrepreneurial activities, and risk-averse banks continue to dominate as

the main source of funds and are often the parent companies of venture capital funds, which again may have a bias towards funding less risky firms and projects (e.g. Leibfritz and Janger 2007).

In June 2008 a draft of a venture capital act was proposed by the Ministry of Finance. This act provides a fixing of the heavily criticised SME finance act ('Mittelstandsfinanzierungsgesetz neu') that had to be re-designed in late 2007 in order to comply with European legislation. The new act solves the problem of double taxation that emerges from the presence of an additional financial intermediary (both the venture capital company and the investor pay taxes for the same investment project) without opening a tax loop to the operative firm at the same time. Policy makers are also discussing the public fund of the funds initiatives.

3.2 Specific Policies and Programmes for Innovative Start-ups

Distinguishing between policy measures supporting innovative start-ups and gazelles, this section follows an investment cycle approach. There is a wide array of policy instruments supporting start-ups at both national and regional level ranging from funding to consultancy. Furthermore, the support scheme of the Austria Wirtschaft Service (aws) that is carried out on behalf of the bm:wa and, in this context to a certain degree – of the bm:vit within the initiative of the bm:wa to promote the setting-up of new companies offers a broad range of support measures ranging from the pre-start-up stage to equity guarantees.

The programmes cover support measures for young entrepreneurs such as “Gründungssparen”, “Unternehmensdynamik”⁴⁰, (double) equity guarantees, support of IPR protection and exploitation, i2 – market for business angels (a platform facilitating the matching of relevant projects with business angels)⁴¹, as well as the new programme for the promotion of the development and establishment of innovative companies (JITU – Förderung von Gründung und Aufbau junger innovativer technologieorientierter Unternehmen), which consists of the modules PreSeed, seed financing and temporary management.⁴²

The module PreSeed supports pre-start-up projects up to max. 100.000 €, the module seed-financing offers the provision of funds and facilitation of access to the capital market as an intermediary between entrepreneur and capital market, thus also aiming at the creation of highly skilled jobs in Austria. The programme provides a profit-related repayable grant up to 1 Mio. €. The funding comes with a package of coaching and monitoring for the new entrepreneur(s). Temporary management supports the temporary insourcing of external experts and managers.

Furthermore, the aws provides *equity guarantees* to high-tech SMEs. The programme tries to overcome a finance gap that small companies face since they typically are not listed and therefore not attractive for investors that are not familiar with the specific company and its management as information on these companies is hardly available. Through the provision of guarantees for investors investing in these companies, the risk of default is shared and therefore more equity is available for SMEs.⁴³

In its “*founder service*” initiative, the regional branches of the Austrian Federal Economic Chamber offers comprehensive consulting services to potential founders of firms, franchisees and successors. Branches are located in each of the nine regions of Austria and offer legal advice, information about authorities and official channels, markets and business plans, platforms, incubators, technology parks and other promotion agencies and public funding. Furthermore, the initiative organises workshops and publishes information material on a regular basis⁴⁴.

⁴⁰ <http://www.proinno-europe.eu/index.cfm?fuseaction=wiw.measures&page=detail&id=8736&CO=1>

⁴¹ <http://www.proinno-europe.eu/index.cfm?fuseaction=wiw.measures&page=detail&id=6880&CO=1>

⁴² <http://www.proinno-europe.eu/index.cfm?fuseaction=wiw.measures&page=detail&id=8040&CO=1>

⁴³ <http://www.proinno-europe.eu/index.cfm?fuseaction=wiw.measures&page=detail&id=7009&CO=1>

⁴⁴ <http://www.proinno-europe.eu/index.cfm?fuseaction=wiw.measures&page=detail&id=9412&CO=1>

The *Start-up Initiative* of the FFG is aimed at promoting innovative, technology-oriented companies. Due to stricter selection criteria and increased security requirements for bank funding (Basel II) and given the underdeveloped venture capital market in Austria, innovative start-ups may suffer from a lack of finance. Hence, the FFG offers the following measures designed to support young companies. This includes project financing of up to 70%, loan repayment after 5 years, funding of feasibility studies, technology-Rating "Techrate(R)" which assesses the technological potential of a project as well as access to a venture capital forum that helps contacting potential investors. In order to be eligible, firms have to be younger than 6 years, their annual turnover may not exceed 50 million euros, the balance sheet total must be less than 43 million euros and the company must have fewer than 250 employees⁴⁵.

Feasibility studies promoted by the FFG seek to increase the likelihood of innovation and start-up success. Austrian Enterprises have a lot of innovative ideas but the implementation is often not undertaken due to unforeseen risks. Studies can reduce those risks. This initiative is designed especially for SMEs to give them a more rational decision base. Studies should be carried out by expert organisations such as universities, research institutes and similar organisations. The FFG offers *technology rating*, which is a consulting service that aims at evaluating the technological capabilities of a firm. It comprises four modules: technology, management, market and finance. The FFG puts focus on technology, however also provides experts conducting other evaluations. The project's aim is to produce a certificate about the technological quality of the firm's innovation in order to help attract investors⁴⁶.

In order to address knowledge transfer, the *AplusB-Centres* have been established in order to qualify, counsel and coach start-ups. The programme's characteristic features have been designed on the model of international examples. They are implemented by at least two partners that together organise and obtain subsidies for their centre. As a standard, one of the partners needs to be an academic institution (university, polytechnical college, research institution) and one partner needs to bring in proven know-how in supporting and guiding the establishment of research and technology-intensive enterprises. Moreover a university has to be involved at least through a cooperation agreement. The projected dimension of a given AplusB Centre depends on an estimate of the potential prepared by the applicant, with a minimum of ten start-up projects to be given ongoing support and guidance at any one time. AplusB-Centres can obtain public funding for up to 10 years, with an increased share of own resources during the second half (e.g. through sponsoring, regional authorities, industrial partners etc.⁴⁷).

An example of AplusB is the *INiTS* (Innovation into Business) initiative's objective is to harness and activate the potential of knowledge based start-ups. The initiative offers services when academics want to put their innovative research findings into practice by starting up a company. The aim is to promote entrepreneurship and anchor it in natural-scientific, technical and other research facilities. It also aims at a constant increase in the number of company start-ups with an academic background in Austria, as well as to increase and secure the quality and likelihood of success through early and well targeted support. There are numerous collaborations with industry and links to existing programmes that support start-ups⁴⁸.

There is also an extensive network of technology, innovation and start-up centres that the *Austrian Association of Technology Centers* (VTÖ) has been representing since 1988. It is an umbrella organisation that looks after a network of about 85 incubators⁴⁹. It offers experience and knowledge management to the technology and impulse centres, as well as PR and lobbying activities and the execution of project work. For example, the best practice project "Collective Knowledge" represents the achievements of the Austrian centres in the form of good examples (print and online) and has made an important contribution to knowledge management in the network. Another project gives the

⁴⁵ <http://www.proinno-europe.eu/index.cfm?fuseaction=wiw.measures&page=detail&id=8782&CO=1>

⁴⁶ <http://www.proinno-europe.eu/index.cfm?fuseaction=wiw.measures&page=detail&id=-1396&CO=1>

⁴⁷ <http://www.proinno-europe.eu/index.cfm?fuseaction=wiw.measures&page=detail&id=-281&CO=1>

⁴⁸ <http://www.proinno-europe.eu/index.cfm?fuseaction=wiw.measures&page=detail&id=9383&CO=1>

⁴⁹ <http://www.vto.at>

participants the opportunity to benchmark their facilities management in order to be able to operate as efficiently as possible in this area.

3.3 Integration with other Competitiveness Policies

Start-up policies are regarded as cross-sectional by nature, and policies are usually coordinated with other policy fields. Therefore, there is a great degree of institutional integration within existing programmes of support measures for start-ups in general, and for technology-based start-ups and gazelles in particular. The instruments are administered by a number of institutions, such as the FFG, the AWS, Federal Ministries, the Labour Market Service (AMS) or the local branches of the Federal Economic Chamber. Overlapping contents of innovation policies concern, for example, legal framework, administrative costs, knowledge transfer, internationalisation, etc. Notably, many programmes of the promotion agencies and ministries have an SME focus, and this listing can only be exemplary.

In 2000, the legal framework for start-ups changed for the positive with the amendment of the Start-up Promotion Act (Neugründungsförderungsgesetz, NeuFög) which lowered administrative costs significantly (e.g. World Bank, 2006; Hölzl et al, 2006). Extensive legal advice about the types of companies, the tax system, bankruptcy law, liabilities, tax support measures etc. is being provided to start-ups by the branches of the Federal Economic Chamber. Furthermore, the Labour Market Service consults potential founders of disadvantaged groups, such as long-term unemployed. Also the Austrian Ministry of Justice offers the initiative 'JUS-Net KMU' that provides information on the tax systems of the new Member States to SMEs, as well as access to a network of lawyers, solicitors, chartered public accountants, tax consultants and financial companies.

In terms of skills and human capital there is, for instance, the abovementioned technology transfer and university spin-off programme AplusB. The extensive COMET also aims at promoting pre-competitive collaborative R&D. The programme succeeds the Competence Centres (K-plus), as well as the networking platforms Kind and K-net⁵⁰.

The AWS offers a programme which promotes the internationalisation of SMEs as long as the measures increase Austria's current account. Furthermore, the initiative 'Go International' of the Federal Ministry of Economics and Labour (bm:wa) and the Federal Economic Chamber (WKO) contains more than 30 instruments targeting an increase in the number of exporting countries. Measures comprise consultancy, promotion of participation in fairs and conferences, subsidies for market development, etc.

Start-ups are of much greater importance for the Austrian economy than they were 20 years ago. The lacklustre growth performance of newly founded firms when compared with the USA shows that it is not the number of start-ups that is significant but their growth orientation and capabilities to expand. Thus, in order to promote the formation of new enterprises, Austria needs to go beyond focusing on start-up rates alone, which is increasingly being recognised by policy makers. The post-entry phase and the growth orientation of companies have recently been receiving more attention by policy makers. Yet, further barriers to growth need to be identified and eliminated, and economic policy measures need to focus more on the structure rather than on the number of start-ups (Hölzl et al, 2007).

Yet, a number of policy fields show potential for improvement (e.g. Hölzl et al, 2007 or see OECD: Economic Survey: Austria 2007). Firstly, the duration of legal procedures involved in founding a firm is rather long, minimum capital requirements are still high, and there is still potential for the reduction of administrative costs. Furthermore, there is still potential to embed an entrepreneurial attitude in the education system. In addition, there is an ongoing debate about a fund of funds initiative that shall be hosted at the AWS.

⁵⁰ <http://www.proinno-europe.eu/index.cfm?fuseaction=wiw.measures&page=detail&id=-1213&CO=1> (and <http://www.proinno-europe.eu/index.cfm?fuseaction=wiw.measures&page=detail&id=-1212&CO=1>).

INNO-Policy TrendChart

Barriers to market entry should be lifted. These are typically part of the competition policy, such as territory protection and needs tests (e.g. pharmacies, solicitors), long training and job experience requirements (e.g. lawyers), restrictive admission assessments (e.g. engineering consultants, patent lawyers). Similarly, there are extremely strict codes of conduct that overly restrict economic freedom (e.g. lawyers, solicitors; see Paterson et al, 2003), advertising bans (e.g. lawyers) and bans to form associations (e.g. doctors, architects, tax counsellors).

Annex: Sources of Further Information

Annex 1: Websites of key innovation organisations

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