Entrepreneurship Environment and Policies: Exploiting the Science and Technology Base in the Region of Halle

Discussion Paper

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AUTHORS' NOTE

This discussion paper on "The Entrepreneurship Environment and Policies in the City of Halle (Saxony-Anhalt): Exploiting the Science and Technology Base" is part of a series of discussion papers resulting from the OECD review on "Strengthening Entrepreneurship and Local Economic Development in East Germany". The review, a co-operative project between the German Federal Ministry of Transport, Building and Urban Affairs and the OECD, is being implemented by the action programme on Local Employment and Economic Development (LEED), within the OECD Centre for Entrepreneurship, SMEs and Local Development.

The review includes, in addition to a global assessment of needs and opportunities for entrepreneurship policy in East Germany as a whole, the examination of six local case study areas. The following areas have been proposed by the participating East German Länder ministries: the districts of Mittweida (Saxony); Altenburger Land (Thuringia) (case study areas 1 and 2); the districts of Uckermark (Brandenburg); Parchim (Mecklenburg-Western Pomerania) (case study areas 3 and 4); the university context in the City of Halle (Saxony-Anhalt); and the borough of Marzahn-Hellersdorf in Berlin (case study areas 5 and 6).

For the local case study in the City of Halle (Saxony-Anhalt) the OECD recruited an international review team. Petr Adamek (Czech Republic), Holger Kuhle (Germany), Rod Shrader (US) and David Walburn (UK) accompanied the OECD Secretariat in a review panel visit, undertaken from 28 to 30 June 2006, to City of Halle. Dylan Jones-Evans (UK) and Andrea Manuelli (Italy) contributed to a regional workshop on 27 September 2006 in Halle, Germany and presented good practice initiatives in entrepreneurship development. Jonathan Potter is managing the review and supervised the fieldwork which has been co-ordinated by Andrea R. Hofer. Wolfgang Helmstädtter represented the Federal Ministry for Transport, Building and Urban Affairs, "Aufbau Ost" and chaired the regional workshop. Manuela Wehrle from Regionomica/Berlin managed all preparatory works related to the field visit and the regional workshop.

This discussion paper is based on: (i) information from a local diagnostic report prepared by Regionomica/Berlin, (ii) the findings of an international review panel visit, and (iii) the discussion of a draft summary report in a regional workshop.
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The OECD review of entrepreneurship policy in Halle focuses on how to maximise the contribution of the city’s higher education sector to local entrepreneurship development, with a particular emphasis on the development of innovative and growth enterprises through exploitation of the science and technology assets of Halle. The promotion of innovative and growth enterprises has the potential for relatively strong economic impacts as compared with more general entrepreneurship promotion, which often suffers from high local product market displacement effects. Furthermore, there is strong potential to develop innovative entrepreneurship around core science and technology strengths even in the context of a depressed regional economy. For the most part, the commercial exploitation of university research will produce high technology businesses or businesses where the added value will depend heavily on innovation. Success for these businesses will usually depend on being able to address a global market – or at least a national or continental market – from the very beginning. Issues such as the economy of the region in which the university is situated, the level of demand or the numbers of unemployed are therefore much less important, although the availability of investment finance in the university’s home region will be a relevant factor.

The approach to promoting entrepreneurship through the higher education sector differs in a number of respects from the more general promotion of entrepreneurship activity. There are two important targets: the creation of enterprises by highly-skilled graduates and researchers and the transfer of technology from higher education to innovative local small and medium-sized firms. Whereas much general support for entrepreneurship can focus on provision of basic, small scale advice, facilities and finance, support for innovative entrepreneurship tends to require greater efforts focused on a small number of high potential firms and entrepreneurs. Particularly important needs are to develop a more entrepreneurial culture among scientists and technologists, provide longer-term physical spaces and financing for company development that can support growth and to develop a range of initiatives for technology transfer.

Effective local policies for entrepreneurship promotion need to be comprehensive, integrated, well resourced and adapted to local needs. They therefore have to bring together the full range of stakeholders that are involved, or could be involved, in activities affecting the local entrepreneurship environment. These include the public sector, covering the full range of federal, Land and local governments and development agencies, as well as private and non-profit sector organisations such as universities and colleges, chambers of commerce and crafts, and industry and business associations. Proper mechanisms are required to ensure that all of these stakeholders can input into policy design and delivery in such a way as to maximise synergies.

The main chapters of this Discussion Paper discuss various factors relevant for the development of innovative and growth enterprises through exploitation of the science and technology assets of Halle. The chapters are structured in a three-fold way resulting from a brief initial discussion about strengths and weaknesses, a set of recommendations is developed for further expert discussions at local, Land and federal level. International learning models, selected by the authors as good practice examples, illustrate the recommendations given and offer ideas and inspiration for policy innovation. The international learning models constitute a core component of the discussion paper. They aim at bringing to light: new local approaches that
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could better exploit opportunities or overcome barriers to the development of innovative and
growth enterprises through exploitation of the science and technology assets; methods to
improve the effectiveness and efficiency of existing local policies and programmes; and,
methods to improve the co-ordination and delivery of local entrepreneurship instruments across
different programmes and partners and to build more comprehensive and integrated policies.

Both the discussion of strengths and weaknesses, and the list of recommendations are not
meant to draw-up an exhaustive picture of the local scenario, leading to immediate and concrete
policy actions. The aim of this paper is, rather, to stimulate and catalyse a process, whereby
regions, cities and districts in East Germany can stand back and reflect on their overall options,
needs and priorities, by facilitating an exchange of information on innovations and good
practices from a range of OECD Member countries.

The key messages of the report, in terms of suggested actions, are summarised in an Action
Plan included in the Annex of this discussion paper.
Introduction

The assessment of small business development coming out of university research departments involves a very different approach to that of regional economic development as a whole. For the most part, the commercial exploitation of university research will produce high-tech businesses or businesses where the added value will depend heavily on innovation. Success for these businesses will usually depend on being able to address a global market – or at least a national or continental market – from the very beginning. Issues such as the economy of the region in which the university is situated, the level of demand or the numbers of unemployed are therefore much less important, although the availability of investment finance in the university’s home region will be a relevant factor. It is perfectly possible to have vibrant entrepreneurship within a university located in a region with a poorly performing economy, and vice versa. There are varying degrees to which university and research and teaching activities are related to their regional economies.

Some of the factors vital to university success in exploiting its research include:

- A motivated and capable academic leadership at the highest level;
- A supportive university administration;
- The existence of a cadre of academics and research staff for whom running a business is an attractive career option;
- The availability of support programmes and training for academics who wish to become entrepreneurs;
- Access to funding streams which are relevant to high-tech business growth ranging from the very early stage to the demands of high growth; and,
- The ready availability of suitable premises for early stage businesses close to the university.

Unlike regional economic development where public policy interventions struggle to make a difference to the overall performance of the economy, even when they are successful in their own terms, interventions within the higher education sector have the potential to make a significant difference. The provision of facilities and programmes as set out above is not difficult. Many universities, often working in partnership with government, have taken the steps to create the right conditions for entrepreneurship to flourish. However, in practice, many universities struggle to make progress. Many simply lack a strong enough research base to produce a worthwhile flow of business projects. There is also, particularly in Europe, a
reluctance on the part of many academics to have any interest in the commercial exploitation of
their work, or to have any ambition to become successful business people. These inhibiting
factors apply to academia in addition to an overall European culture which is not supportive of
entrepreneurial activity and risk taking.

Changing attitudes and building up research activities in commercially interesting areas is,
generally speaking, a long term task which many universities do not have the financial or
management resources to sustain, even with the support of governments. There are, however,
noteable examples of European universities which have taken measures over many years to build
and encourage entrepreneurial cultures. The University of Twente in the Netherlands is the home
of the Dutch Institute for Knowledge Intensive Entrepreneurship\(^1\) and Imperial College, London
has its Entrepreneurship Centre\(^2\) in addition to its impressive research base. The developments at
the Catholic University of Leuven\(^3\) in Belgium are also worth reviewing for Halle. Over the last
six years Leuven has attracted a major presence of high-tech firms around its campus through a
combination of funding spin-offs from its research departments and attracting large corporations
to invest in and support the process. Apart from the development of strong clusters around
particular areas of technology in Leuven, the developments have led to large numbers of
research employment opportunities. These institutions place a very high priority on developing
businesses and business ideas from their research and make this a high profile activity.

The market failures which affect the financing of small firms are well documented and do
not need to be repeated here. However, high-tech firms arising from university research do face
particular problems associated with the dynamic of substantial risk in the early stages, but the
real prospect of significant returns is for the few successful projects. Funding for very early stage
development is not only very high risk in itself, but investors backing a successful venture may
have difficulty in securing their returns when large sums are needed later on. There are a number
of examples of public sector programmes to provide subsidies for early stage work where the
risk is very high including the University Challenge Fund\(^4\) introduced nationally by the UK
government in 1999, and many initiatives introduced at the local level. However, there has also
been a private sector response to the special funding needs of high-tech businesses, particularly
in the U.S... Because of the potentially very large returns which can be generated by businesses
which quickly succeed globally, specialist venture capital funds, chiefly based in the U.S. have
developed to serve this market and increasingly source deals world-wide.

\textbf{Strengths and weaknesses}

The Halle University community is well endowed with programmes to support enterprise
and the spin-off of small firms arising from research and the academic community. The review
panel found that a sophisticated capability for financing high growth small businesses, as well as
early stage innovative projects exists or is at an advanced stage of development in Halle.

\(^1\) For further information about the Dutch Institute for Knowledge Intensive Entrepreneurship,
see http://www.utwente.nl/nikos.

\(^2\) For further information about the Entrepreneurship Centre at the Imperial College in London,
see http://www.imperial.ac.uk/entrepreneurship.

\(^3\) For further information about the Catholic University of Leuven in Belgium, see

\(^4\) For further information, please see http://www.dti.gov.uk/science/knowledge-transfer/schemes/University-Challenge-SEED-Fund/page12117.html.
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There is much European funding available to sustain support programmes, and there is evidence of small firm-friendly bank finance, venture capital with high-tech capability and a growing business angel activity for smaller deals. With the help of European funding the Halle community has put in place an imaginative infrastructure for enterprise support. There are business incubator and real estate facilities available to growing firms.

There seems to be a strong and effective leadership to the overall effort of the university community. The "UNIVATIONS" network appears to be well-built and supportive of university-based enterprise in Halle. There is an Institute for Entrepreneurship and Innovation to foster enterprise, and additional programmes such as business plan competitions, and a "First Tuesday" scheme is operating.

Members of the university, who were committed to increasing entrepreneurship, considered the main barriers to enterprise to be the university itself not being sufficiently "start-up friendly", together with a lack of motivation amongst students and faculty staff, and a need to increase the level of resources going into applied research.

It was felt that efforts to boost high-tech spin-offs are hampered by the lack of a strong industrial base in the region through which collaborative research projects between universities and firms might have been developed. Although the region is strong in polymers and other chemicals, it seems that the private sector does most of its research elsewhere.

The following problems affecting high growth SMEs were signalled by the entrepreneurs who were interviewed: larger banks have cut back their programmes to help small firms; conditions attached to state-based small firm funding (e.g. procurement requirements) are too onerous; and there is a gap in funding in the pre-trading phase of company development. However, there was a general agreement from respondents that for good quality propositions funding for business growth was not a major problem.

Although some of the problems outlined by interview respondents had special local and national elements to them, they were for the most part similar to those which any university seeking to see more enterprise take place might express. However, it was pointed out that special problems exist because of legacy of the GDR with its culture being against capitalism and entrepreneurship, and an attitude from people to seek the security of employment rather than the risks of being in business.

Whilst the university respondents spoke with eloquence about the challenges and the steps needed to boost enterprise, the overall approach seemed, relatively speaking, to lack the strong business dynamic of the type one might encounter in a research institute with a strong spin-out record, such as the University of Leuven,(see above). Here, one would see enterprise on campus as principally being about making money and making individuals rich, through the outcomes of research. This is clearly a subjective judgement by the writer, but it is based on a wide experience of practitioners working in a context where considerable public funding to boost small business growth and innovation is available and where the achievement of spin-outs is seen more as an economic development objective. The point is raised here because a culture where individuals are not primarily motivated to make money was seen as an important issue holding back entrepreneurship in Halle. This observation suggests that there is still some way to go with culture change before entrepreneurship becomes a more vital part of university life. It should be added that these comments apply chiefly to members of the university community, rather than to the entrepreneurs, bankers or venture capital people who were interviewed.
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In the key area of finance for small firms, not only are there a broad range of sources, but the pattern of provision from small loans, through venture capital and business angel finance matches that of any successful region in Europe. This applies both to organisations and to particular funding programmes. The achievements in Halle to put in place measures to boost enterprise in the universities are comprehensive, well thought-out, and in line with good practice elsewhere. It is however important to recognise the scale of public and European funding in maintaining the infrastructure of enterprise support in Halle. The initiatives themselves are impressive, but they are not sustainable without continued public funding. Whilst the commitment of public funding to address market failures in economic development is always going to be required, its scale in Halle will not be sustainable in the medium term as European funding finds other priorities. The direction of public policy in Halle to gradually reduce kick-off funding can be therefore mentioned as promising approach. It can be argued that minimising public subsidy is beneficial in itself in that it encourages a more commercial approach and facilitates better partnership working with the private sector. It is therefore important for boosting enterprise in Halle that already started efforts to emphasise a more commercial sight of the process by the key players are continued and that company building is considered a vibrant commercial activity that goes beyond academic discipline. A thorough going commercial approach is likely to ensure that the right incentives are properly in place.

The following are examples of subsidised support schemes:

The "IBG Venture Capital Company for Saxony-Anhalt" has received EUR 152 million for investment in the period from 2000 – 2006 from public sector sources, with EUR 140 million invested in 61 active technology oriented companies. There are 16 members of staff involved of whom 11 are professional with a scientific or economic background. The company appears to be well managed and to be performing well, especially in terms of the scale of private financing which has been attracted into investee companies alongside its own cash. However, in order to become commercial viable the company will have to attract investment funds from commercial sources and it will have to finance its overhead from fees paid by investors – rarely more than 2% per year of total funds under management. This will almost certainly mean a reduction in the level of funds raised and some pressure on overheads. A more commercial basis for the company’s operations would result in the executives being much more directly incentivised to produce high investment returns. The management of IBG seems to be well aware of these challenges for the future of the company.

The specialist accommodation for small businesses as provided by the "Technology and Founders Centre GmbH" are of a high quality in Halle and their operation is led by a committed management. It was noted that EUR 750 million had been invested there over 21 hectares. No figures were supplied as to running costs, but it was reported that rent levels are subsidised, which is a cost in addition to normal overheads which tend to be high in comparison to mainstream commercial real estate. For the future viability of these facilities it will be important to see the University’s real estate as an asset capable of producing a commercial return, and maybe also against which further funds may be secured. This means that rents should be charged at commercial levels. If public policy wishes to assist companies to pay their rent it should do so by making payments to the companies direct and not by undermining the finances of its real estate projects. It is also bad for firms in incubators to develop without appreciating the real costs of their accommodation, making the move out into fully commercial circumstances more difficult to achieve.

Whilst subsidy and support may continue around the enterprise agenda in Halle for a long time to come, it is strongly recommended that the strategy for the real estate component should
be to minimise this dependence as speedily as possible. Manchester Science Park\(^5\) in the UK provides an excellent example of this being achieved. Jointly owned by Manchester University, the City Council and a group of commercial investors, the company provides high quality accommodation for 100 businesses on the university campus, is profitable and with net assets of more than EUR 18 million is in a position to expand its services to small firms.

It was reported that the "Business Angels Network" in the Halle region is financed at a level of 75% from the European Social Fund and 25% from Saxony-Anhalt. This funding was said to be available for a further three years at which time the Development Bank of Saxony-Anhalt may assume responsibility for the overheads. The financing of the overheads of business angel networks by the public sector is one strand of funding in economic development which can be justified in the long term. Angels wish to see their cash going directly into companies and not into paying network overheads, and it is very hard for networks to generate sufficient funds on their own account through fee income. For the relatively small amount of money required to run an angel network – for example the London Business Angel Network with over 200 investors in membership operates with four staff of which only two are at a senior level – the public sector can expect to achieve a very high level of leverage in terms of the investment finance raised. However, it is important to ensure that angel networks receive only just the level of subsidy needed to maintain their operation. For example, there should be an incentive to seek commercial sponsorship from firms engaged in the investment process – banks, accountants and lawyers – whose involvement will also strengthen the network, helping to introduce deals and new angel investors.

Apart from the aspiration to do things better and on a larger scale – an aspiration shared with many other universities – the main challenge for Halle for the future will be to continue to develop its support capabilities without the current level of public funding. Although there are important issues around the long-term sustainability of the support structures for entrepreneurship and innovation, it seems that the quality and comprehensiveness of what has been established places the university in a strong position to tackle these problems. The embedding of publicly subsidised initiatives in the work of existing networks in Halle and its surroundings can be mentioned here as a plus that enhances a generation and application of synergies.

**Good practice in Halle**

*Support for enterprise funding and development from within the University*

The support of certain professors from within Martin Luther University has assisted a number of spin-offs to obtain funding from financial institutions. As local banks ("Hausbanken") often lack the necessary technical understanding for fully judging the creditworthiness of a high-technology oriented business idea, this practice has proved to be of great help for the applying companies.

This practice, however, operates on the basis of individual goodwill and is not institutionalised. A formalisation of this consultative agreement, for example with the establishment of a joint project appraisal committee, would help to address the frequent problem of information asymmetry in financing high-tech business proposals. Further, it would also increase the transparency of this kind of university led support.

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\(^5\) Manchester Science Park (http://www.mspl.co.uk).
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Recommendations

Overall, the Halle community is operating from a strong base in seeking to improve its enterprise efforts. The following recommendations are intended to help with this process.

Promote entrepreneurship and associated skills. There seems to be a general concern that the scale of entrepreneurial activity in Halle is not as great as it should or could be. The issues behind this concern are not the most susceptible to rapid change: attitudes of staff and students to enterprise and their ability to undertake the activity, the scale and breadth of research projects, the ability of the university to attract academics from the rest of Germany and the rest of the world drive its research effort, and the ability of the university to develop industry links around its research – if not in Saxony-Anhalt, then from a much wider area based more on research topic than geographical proximity. Examples of good practice in promoting entrepreneurship and the skills associated with it have already been presented and there is more which Halle could do. Home-grown entrepreneurs indicated that this was a lack. The Institute for Entrepreneurship and Innovation may represent a worthwhile development in this respect. The factors involve the universities in the region making a greater national and international impact. This requires investment to attract academics and create attractive facilities, as well as a promotional strategy to make the Halle universities and their work much more widely known on an international scale. Just as internationalisation is vital for fast-growing small businesses, so it is for a research-based university. There may well be merit in some aspects of this work done through a partnership between the regional government and the universities.

Review the current extent and utilisation of public funding. The issue of the extent of public funding supporting enterprise development needs to be tackled. Successes achieved so far through a gradual reduction of public kick-off funding prepare the right ground for further work in this direction. Not only is it unsustainable, but it has the potential to undermine the commercial dynamism which is essential to development of a thriving small business economy in any context – the university circumstance is no exception. Of course, the present funding programmes are intended to kick-start activity and not to support it in the medium or long term. However, experience in other jurisdictions suggests that the transition to self-sufficiency is usually very difficult and much of value can be lost in the process. It is therefore recommended that the existing leaders of enterprise development involve all the stakeholders in the Halle community in devising a strategy for developing a more commercial approach to their work. This would mean looking at ways to minimise their dependence on public funding and increasing the mechanisms of the commercial market place in the work of their organisations. This would have a beneficial effect on the outlook and function of organisations, even whilst the present level of subsidies are available, and they would be in a much more robust position to develop their own strategies for the future. This process should include putting in place incentives for management involved in the investment process to encourage the achievement of challenging commercial targets for their operations e.g. returns on real estate, performance of funds under management whether their provenance is the public or private sector. Looked at from the point of view of the current situation in Halle, there may not seem to be a great need for these changes, and little urgency either.

Discuss the role of local leadership. There seem to be a broad range of organisations and individuals enthusiastically working towards the common goal of boosting entrepreneurship in the Halle universities community. The leadership of key academic staff was highlighted in the interviews as being an important component of this effort. However, their role could be further institutionalised with the establishment of a consultative board including key academic staff and
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a range of organisations contributing to economic development. Such arrangements could also be utilised to facilitate financing of business ideas.

Develop programmes to boost the numbers of business angels. The objective of such programmes is to increase the pool of business angel investors and thus boost the supply of equity to small firms. This means recruiting high net worth individuals with relevant business experience and an interest in helping to build, support, mentor and invest in early stage companies with growth potential. Often potential angels are reluctant to get involved partly due to a lack of knowledge about what is entailed and a lack of relationships with existing angel investors. The attraction of “knowledge angels” to pass on relevant professional and business experience to investee companies, without necessarily investing themselves has proved a successful ingredient of such programmes elsewhere. Widespread marketing campaigns can be helpful in increasing a general awareness of and interest in business angels activities.

Help firms to assess their own investment readiness. Programmes should be designed to address a perceived lack of investment readiness in certain sectors by improving the level of knowledge in firms about their own growth and return potentials and methods of financing. Such programmes have proved to raise the level of deal flows elsewhere. Key features would include intensive working with each company; highly interactive workshops based on role play exercises and delivered by experienced industry experts like accountants, lawyers, business angels, clearing banks, venture capital firms and corporate finance firms and a free diagnostic investment-readiness tool. Such programmes enable firms to assess their own investment readiness, obtain feedback on their strengths and weaknesses, their ability to access equity finance, and increase investor interfaces with underinvested sectors.

Increase international networking efforts. Active involvement in international networks would help to contribute to the internationalisation of the local economy. It is important to expose leading university managers and policy makers to colleagues working in other jurisdictions and to establish working networks with the people involved. There is a management development issue to be tackled here to expose leading managers and others to enterprise activities in other jurisdictions and to establish working networks with the people involved. This could be tackled through active involvement in international networks of economic development practitioners such as the European Association of Development Agencies (EURADA)\(^6\), which is currently planning to launch a European network of universities and regions, the International Economic Development Council (IEDC) in the U.S.\(^7\), the European Business Angels Network\(^8\), and the National Business Incubation Association\(^9\) as well as the activities of the OECD LEED Programme\(^{10}\). This exposure to other practice could be complemented by study visits – the internet is rich in information about what universities around the world are doing to boost enterprise – and it is suggested that the U.S. might have examples which would be particularly helpful to the Halle community. Such active involvement in international networks would also help to promote Halle more widely and contribute to the internationalisation imperative recommended above.

\(^6\) European Association of Development Agencies, EURADA (http://www.eurada.org).
\(^7\) International Economic Development Council (http://www.iedconline.org).
\(^8\) European Business Angels Network (http://www.eban.org).
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International learning models

Although there appears to be no lack of innovative programmes operating in Halle, the following examples may be of value. They concern helping high-tech firms to improve their readiness for equity investment (although a number of respondents in interviews indicated that finance for good prospects was not a problem in Halle it would be remarkable if there was not scope for improvement and helping more small firms improve the quality of their bid), and a means for public policy to boost the numbers of business angels.

Enterprise Agency Model

It may be useful for a version of this model reflecting local needs to be considered for Halle. As has already been suggested, within the context of the universities it would probably not be wise to set up such a service through a separate, new organisation. There is already a rich fauna of service offering organisations and some sort of enterprise agency service might be developed through an organisation such as "UNIVATIONS".

Enterprise agencies are ubiquitous in developed western economies and there is no particular example of best practice which might be recommended. The key factor is they should be fit for purpose and reflect the requirements of their circumstance. For present purposes, the university examples of enterprise support already suggested above would be useful sources of information, but further research via Google of universities with reputations for success in entrepreneurship should also produce further relevant information.

The following characteristics are generally common in the more effective agencies:

- An organisation dedicated to fostering and assisting enterprise in the form of small, early stage and start up businesses.

- They should be relatively independent, stand-alone organisations supported by a range of stakeholders from the public, private and third sectors with governance arrangements to reflect this.

- They should be staffed by experts in small business support, sometimes with a combination of permanent staff and secondees from stakeholder organisations.

- It would be usual for them to run on a small overhead financed through the sponsorship of stakeholders, and supplemented by revenue generated by running business support programmes for third parties. (Such programmes might include the management of small loan funds or mentoring schemes). This means that enterprise agencies often run like small businesses themselves which may help them to relate well to clients.

The development of such a service offering in Halle would depend on the extent to which a gap in current provision is identified. It will be important to avoid duplication and caution is advised.

Apart from the university web sites, further background information on enterprise agencies can be found from the UK National Federation of Enterprise Agencies, though the emphasis here will not be on the specialist area of university-based enterprise.11

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11 For further information on the National Federation of Enterprise Agencies, see http://www.nfea.com.
The Ready for Growth Programme, U.K., Spain, and Greece

This programme operated in London and the South East of England, Catalonia and in Greece. The partners in the project were London Business Angels, the agency Barcelona "Activa" and "iVen", a business incubator firm in Greece. The programme was directed at the population of high-tech SMEs accessible to the partners rather than to a particular region. The EUR 3 million funding for the programme came as part of a European Commission programme. It ran from 2002 to 2004, but is maintained with its associated materials by the partners.

The main objective of the programme was to offer a complete programme of support for entrepreneurs in small businesses with high growth potential operating in the e-content sector, enabling them to access the finance needed for their growth. The programme was designed to address a perceived lack of investment readiness in digital content SMEs across Europe and the overall lack of investment in this sector. Thus the intention was also to increase investor interface with the sector, improve their level of knowledge about its potential, and to support increased deal flow. A further objective was to establish longer term sustainability by developing a range of customised products and services under the programmes’ brand which would be exploitable and transferable to a wide number of agencies and intermediaries, as well investor networks across Europe. Because the primary focus of the programme was firms with high growth potential, raising equity finance was the core objective, although other types of finance such as bank loans would be likely to form part of any funding package in a successful fundraising. Because the bulk of the participant firms were early stage and requiring relatively small amounts of investment in the "equity gap", the emphasis on funding sources was to business angel networks.

These were the key features of the programme:

- Intensive working with each company with the programme leading directly to an opportunity to attract investment. All participant companies were guaranteed a pitch to real investors at the end of the programme.

- A key element was a two-day intensive workshop in which 30 small firms participated. The content was delivered by experienced industry experts: accountants, lawyers, investors – business angels, clearing banks, venture capital firms and corporate finance firms. The workshops also consisted of panel discussions and role play exercises. The workshops covered the components of planning and developing a funding bid, as well as techniques of pitching for funding.

Special reference manuals were produced for participants:

- **Planning**: assessing the opportunity, analysing the competition, writing the business plan, starting a company and preparing a Shareholders Agreement.

- **Building**: managing accounts, recruiting a team, preparing employee contracts, training employees, incentive schemes, employment law, insurance and protecting IP.

- **Selling**: writing a marketing and communications plan, defining a vision and mission, conducting public relations, defining a sales strategy, pricing, and making strategic alliances.
Facilitating University Entrepreneurship

- **Funding**: investment readiness, raising non-equity funding, raising business angel funding, pitching to investors, preparing for due diligence, understanding the investment process, negotiating and investment, and investor exits.

The programme contained an important strand of online support. The use of the web-site as a recruitment tool ensured a wider outreach and facilitated registration. A key element was a free diagnostic investment readiness tool. This enabled firms to assess their own investment readiness, obtain feedback on their strengths and weaknesses and their ability to access equity finance. An on-line access to workshop material and the presentations from experts facilitated preparation and reflection on the course. Participating companies also had the chance to network during the joint capacity-building sessions and the commercial benefits of this were clear as the programme progressed. An important characteristic of the programme has been that once the start-up costs for the materials and on-line facilities has been met, it is relatively inexpensive to operate.

During its two years of monitored operation 502 companies participated in the programme including 210 in the UK, 184 in Greece and 108 in Spain. 17 workshops were held, involving over 100 investors, experts and intermediaries.

Surveys of the participants after the programme showed the following outcomes:

- 60% - 70% of companies had rewritten their business plans and reviewed their business strategies;
- 30% - 40% had successfully accessed equity or other forms of finance (seed, debt, grants);
- 30% - 40% had identified new markets and customers; and,
- 60% had developed new business partnerships.

This approach has clear relevance to the policy objective of assisting high-tech, potential high growth companies to obtain equity investment. The process has the added benefit of also helping firms to understand their requirements apart from finance, and the imperatives of business planning.

The key factor in its success was the guarantee of a real opportunity to raise finance at the end of the process. It therefore had key relevance for the participating companies and was not simply a form of business training.

The key challenge for those implementing the programme is to find and recruit a sufficiency of good quality potential deals to provide credibility to the process.

**Contact details of partners:**

- United Kingdom: London Business Angels: [http://www.gle.co.uk](http://www.gle.co.uk)
- Spain: Barcelona Activa: [http://www.barcelonactiva.es](http://www.barcelonactiva.es)
- Greece: iVen: [http://www.iven.gr](http://www.iven.gr)
Facilitating University Entrepreneurship

The Business Angel Development/Ready2Invest Programme in London, U.K.

This programme has operated in the London region since 2004 being funded by the London Development Agency. However, the potential angels participating in the programme have been drawn from the wider south east region of England, and active business angel networks do not confine their investing activities just to London. This pattern would probably also apply to Halle, and their may be the possibility of extending the area from which angels are drawn to invest in university spin-offs. Unlike public sector funding which is often restricted to a particular jurisdiction, angel investors can place their funds where they wish.

The objective of the programme has been to increase the pool of business angel investors and thus boost the supply of equity to small firms. This means recruiting high net worth individuals with relevant business experience and an interest in helping to build, support, mentor and invest in early stage companies with growth potential. The programme was developed because it became clear from information supplied by intermediary firms that many potential angels were reluctant to get involved partly through ignorance of what is entailed and also because they lack relationships with existing angel investors. This even applied to people with much commercial and industrial experience, but who did not have small business investment knowledge.

The programme was also considered necessary to maintain the capacity of existing networks. Business angels often have a limited amount of money to invest and once these funds have been placed, they drop out of active investing. The programme was also designed to attract "knowledge angels" to pass on relevant professional and business experience to investee companies, without necessarily investing themselves, or perhaps only making a small investment. It is important that knowledge angels should not be confused with consultants who may work for a fee. Their contribution should almost always be made in return for equity in the investee company.

Subsidiary objectives of the programme have been to: (i) improve the effectiveness of angel investing through the training provided; (ii) boost investment deal flow from the networks of new investors recruited through the programme; and (iii) increase general awareness of business angel investing through the marketing of the programme.

The programme is offered for a minimal charge to participants, although membership of a business angel network in the UK will normally require a substantial fee, sufficient to indicate the seriousness of the member to engage in investment activity. Participants are generally introduced by accounting firms which may also be active in the programme, either through sponsorship or involvement in workshops, or both. Participants will usually be the clients of those firms. Marketing materials and finance are available under the programme to promote awareness amongst target groups.

At the heart of the programme is a rolling series of workshops which include experienced investor presentations concentrating on actual case studies, an introduction to small business investment skills, a guide to methods of syndication and co-investment, and presentations of the tax and legal issues in becoming a business angel. In addition to the workshops there are round table discussions with investors. Participants can attend as observers business angel network presentation events. An on line self assessment diagnostic tool and a specially produced angel investment manual help participants to test their suitability to be a business angel in privacy, and educates at the same time them as to the process and risks.
The outcomes of the programme in London so far are:

- 350 people attended with the workshops;
- 58% joined an angel network or group;
- 70% of these have made investments so far;
- 30% have invested as part of a syndicate;
- 75% intend to make future investments; and,
- 70% of all participants had recommended the programme to others.

A programme of this nature could contribute significantly to the development of the business angel investment capacity to serve business spin-offs from the Halle universities. Experience in other jurisdictions – in France, the UK and especially the U.S. – suggests that angels are a particularly useful category of investor for small high-risk, high growth potential businesses.

The "Ready2Invest" programme was successful because it operated as part of the work of an established business angels network, involving members directly in bring on the new, potential angels. The support of financial intermediaries in identifying candidates, providing sponsorship and participating in the training was also important. Above all, the financing from the London Development Agency based on a strategic awareness of the importance of boosting angel activity was critical.

Further information

Greater London Enterprise: http://www.gle.co.uk
UNIVERSITY ENTREPRENEURSHIP TRAINING AND KNOWLEDGE TRANSFER

By Rod Shrader, US

Strengths and Weaknesses

One goal of entrepreneurship education is to help launch actual start-up businesses that are spin-offs from universities. These programs aim to provide students with real world experiences, transfer technologies and knowledge from the universities to businesses, and, as a consequence, stimulate economic development. UNIVATIONS has been highly successful at launching such start-ups. Since its founding in 2004 UNIVATIONS has consulted with or been involved in some way with more than 200 student-owned businesses. Of these about one third are profitable and about one third employ more than just the entrepreneur(s) who founded the business. UNIVATIONS represents a particular strength because it can be assumed that without this program many of these businesses would not have been started and others would not have performed as well. In addition, success breeds success. The more businesses are launched by UNIVATIONS the more students and other stakeholders will take note and become interested in participating in the program. Over time, a culture of entrepreneurship will be instilled in the region. By attempting to start businesses in an environment where they have lots of encouragement and assistance, students who might not otherwise consider themselves entrepreneurial learn skills and build confidence related to entrepreneurship. Consequently, even if their current projects do not necessarily lead to launching successful firms, chances are greatly increased that some will start successful businesses in the future based on what they learned through the UNIVATIONS experience.

UNIVATIONS represents extraordinary and commendable co-operation amongst four institutions of higher education. This organisation provides a model of success that could be emulated by other clusters of universities throughout the world. Each institution has strengths in basic research. Each university participates by providing students with information about UNIVATIONS programs, providing faculty and staff to mentor students and liaison with UNIVATIONS, and providing high-quality incubator space located close to the institution. Furthermore, start-up teams have free access to university facilities, including lab space, to augment their resources. The spirit of co-operation amongst these four institutions is exemplified by the fact that each university refers student entrepreneurs to the most appropriate resources for their needs, even when those resources are at one of the other institutions. This inter-institutional co-operation is important because each institution has its own unique strengths that can compliment the strengths of the other three and/or compensate for weaknesses or limitations of the other three. As a result, a program spanning all four institutions is superior to one housed in any single institution. In addition, each university has strengths in different disciplines and by fostering interdisciplinary communication and co-operation, UNIVATIONS helps foster creativity and innovation.

Programs in Halle use experiential learning (engaging in real-world projects to launch businesses) as a means of effectively teaching entrepreneurship. Even if some businesses fail the learning mission will be accomplished. UNIVATIONS also engages business experts from
outside the University to mentor student teams to further enhance the realism of projects. Studies have shown that students often learn better by doing that by listening or other more traditional means of education. In addition, learning by doing greatly improves the retention of knowledge and skills. Finally, the experiential learning gained via UNIVATIONS programs is much closer to the “real world” than the theoretic approaches of many textbooks.

The focus of entrepreneurship education in Halle is interdisciplinary. Whereas most entrepreneurship programs are centered in business schools and a few institutions target entrepreneurship education toward technical students, the approach in Halle is to provide access to entrepreneurship to all students throughout all campuses and faculties. Furthermore, interdisciplinary project teams include students of economics as well as students of sciences. This forward-thinking approach is at the forefront of entrepreneurship education and has only recently been pursued by very few other institutions. This interdisciplinary approach is useful because it allows students with various strengths to learn from each other. It provides experiences that better prepare them to work in interdisciplinary groups in the business world after graduation. Furthermore, interdisciplinary collaboration has been proved to enhance creativity and innovation. As a result, not only do interdisciplinary teams of students learn better job skills, but they also are more likely to launch sustainable new business ventures.

However, despite this interdisciplinary reach, most start-ups in Halle continue to be founded by students of the natural sciences. This highlights a weakness in the program in terms of reaching and inspiring non-technical students to consider entrepreneurship.

Educational programs in Halle center on the writing of business plans, financial management, and accessing capital, all of which are fundamental to starting a business and all of which were traditionally not taught outside of economics. These skills are critical to launching a business. However, most of the learning is done sporadically outside the classroom in programs like UNIVATIONS. While it is important that these skills be taught, teaching them through voluntary extracurricular workshops means that there will inevitably be inconsistency in terms of which workshops students take and it may be difficult to monitor the impact of the workshops.

Technology-based businesses being spun out of universities primarily commercialise the inventions of students (including graduate students doing research directly with professors), however, there has been less effort to commercialise technologies invented by professors. Furthermore, regulations make it difficult for professors to actively engage in the start up of businesses. As a result, some of the best technologies may not be being transferred and the universities where the technologies were invented do not realise all the potential financial benefits of commercialise in those technologies.

Basic research is funded by the government. However, applied research to explore commercial applications must be funded by businesses. There is generally a gap that must be bridged in order to translate basic research into commercial applications and this gap is normally filled by start-up companies. Funding for this type of research and development is often extremely difficult to find. Governments do not fund it, established businesses often see it as too risky, start-ups have difficulty accessing capital, and funding this type of activity is not a priority for conservative university administrators. UNIVATIONS helps fill this gap by bringing investors and start-ups together and by prescreening ventures in a way that enhances their potential for success and increases investor confidence. As a result the likelihood is increased that high technology start-ups will be funded to conduct translational research.
UNIVATIONS has substantial grants to support operations through 2007. However, to be sustainable in the long-term the program must become self-supporting independent of government grants. It appears that the directors of UNIVATIONS have relied heavily on government support and have not made substantial moves toward sustainability. Furthermore, it appears that little planning has been done to prepare for the end of government subsidies. As a result, the long term future of the program is uncertain.

Students and recent graduates believe that investment capital is scarce. However, experience in Halle has indicated the opposite. Capital is available from angel investors who are ready and able to invest. However, good investment opportunities are lacking (i.e., good ideas fleshed out by a convincing business plan, with a competent management team prepared to implement to start up). Experience has proved that money is indeed available for good investment. While it is a great strength that adequate investment money is available in the region, it is clear that greater efforts are needed to communicate to potential entrepreneurs that money exists and how to best access those resources.

Universities in Halle provide interdisciplinary seminars, workshops, and the networking events on a regular basis to enhance the culture of entrepreneurship that had been previously lacking. They also promote entrepreneurship by spotlighting the accomplishments of successful entrepreneurs and thereby providing role models for students. These programmes are quite helpful to the area because role models are one of the primary factors associated with increased entrepreneurial activity. In addition, workshops and the Founder Academy provide training to compensate for specific technical and business skills founders lack. Entrepreneurs can get assistance with market analysis, business plans, and presentations. This training should greatly enhance the likely of success for businesses that avail themselves of it. Furthermore, many entrepreneurs never receive such training because they do not know where to get it or because they are embarrassed to admit they need it. These workshops should overcome this barrier because they are public, well promoted, and attended by numerous entrepreneurs with varying degrees of experience and skills.

The universities have successfully engaged business and civic leaders from the community. These leaders act as mentors to students, provide capital and other resources for university-based start-ups, and are potential strategic partners for businesses launched through the programme. As a result, a useful network has been systematically created that would take entrepreneurs a great deal of time and effort to build and sustain independently.

An investment fund of ca. EUR 1 million has been raised to provide seed capital grants for start-ups. To provide additional access to capital an angel network has been formed and venture capital from the federal government has been accessed. This is a great asset not only because it provides the financial resources to launch businesses, but also because it signals to potential entrepreneurs that entrepreneurship is supported and that their efforts might be rewarded.

Programmes focus on quality, not quantity. The mission is to create growth oriented businesses that will create jobs in the region. Although there are lots of anecdotes of successes, objective measures of outcomes of entrepreneurship education programmes are lacking. Such objective measures are necessary to know for sure whether programmes are actually helping and to provide benchmarks for continuous improvement. These represent cultural barriers to founding high potential new ventures. As a result, those businesses which are launched tend to make only modest contributions to economic development and do not contribute to a culture of aggressive entrepreneurship.
Universities in Halle have significant strengths in biotechnology, proteins, and chemicals. This knowledge has value for commercial applications and is therefore ripe for commercialisation. The universities are commercialising these technologies primarily through licensing patented technologies to established firms, which may have only a modest impact on job creation. Furthermore, many technologies do not get patented and most that do are patented only within Germany, which means that many opportunities to create real economic value are lost. Also, if an inventor wants to buy back a technology from the University that inventor must pay only the actual patent costs. As a result, the University gains no value from the intellectual property.

Technology transfer is also accomplished by placing students as interns in technology-based businesses. In addition, science and technology students write theses on the basis of research they do within technology-based businesses. SMEs do not have research and development departments so students add real value by providing free research. Although this process has the potential to transfer technologies bidirectionally between universities and businesses, the process is organic, unstructured, and far from ideal. It is assumed that knowledge is transferred through organisational interactions. However, it is difficult to measure the effectiveness of these technology transfer processes or their economic impact. In addition, this approach to technology transfer is unsystematic and thus probably inconsistent and provides no tangible economic value to the universities.

As another means of technology transfer universities often lease expensive scientific equipment to SMEs on an as needed basis. This facilitates the interaction of universities with technology-oriented SMEs and allows SMEs to have access to the most current technology that they would otherwise be unable to afford. This allows them to keep skills current and reduces their relative disadvantage of size. This is a strength because it effectively uses excess capacity of university-owned equipment, it facilitates communication between university labs and industry participants, and it creates goodwill.

The Institute for Innovation and Entrepreneurship was founded to bridge the gap between start-ups and universities. However, little information has been made available about the Institute’s programmes or their effectiveness.

Although entrepreneurship education is impressively vibrant in Halle, programmes are driven by relatively few high-energy professors. Only 10 to 15% of faculty members have shown any interest in entrepreneurship despite its interdisciplinary nature. Faculty members are required to teach approximately 18 hours per week in addition to research and other responsibilities. As a result few have the time or motivation to assist students with business start-ups. Professors are rewarded for research and teaching. They are not rewarded for economic accomplishments. As a result, programmes are at risk because highly motivated professors might suffer burnout or they might be tempted to move to other institutions where their efforts will be better rewarded. In addition, programmes are not as strong as they would be if there was greater institutional support.

Good practice in Halle

As already alluded in the discussion of strengths and weaknesses, UNIVATIONS is an example of good practice in Halle that should be replicated in other regions throughout the world. There are several things that make UNIVATIONS an example of good practice.
UNIVATIONS appears to work. Since 2004, more than 200 student owned businesses have participated in UNIVATIONS programmes. Amongst alumni businesses, about one third are profitable and about one third employ workers besides the entrepreneur.

UNIVATIONS represents inter-institutional co-operation amongst four universities, each of which has strengths in basic research. Each university participates by providing students with information about UNIVATIONS programmes, providing faculty and staff to mentor students and liaison with UNIVATIONS, and providing high-quality incubator space located close to the institution. Start-up teams have free access to university facilities, including lab space, to augment their resources. The spirit of co-operation amongst these four institutions is exemplified by the fact that each university refers student entrepreneurs to the most appropriate resources for their needs, even when those resources are at one of the other institutions. This inter-institutional co-operation is important because each institution has its own unique strengths that can compliment the strengths of the other three and/or compensate for weaknesses or limitations of the other three. As a result, a programme spanning all four institutions is superior to one housed in any single institution. In addition, each university has strengths in different disciplines and by fostering interdisciplinary communication and co-operation, UNIVATIONS helps foster creativity and innovation.

Inter-institutional co-operation is at the forefront of entrepreneurship education, which is exemplified by the fact that it is a major initiative promoted and funded by the Kauffman Foundation, which is the world largest philanthropic organisation providing support for entrepreneurship education. The Kauffman Foundation recently made it clear that inter-institutional co-operation is now a requirement for significant funding by them. However, few programmes in the US span multiple institutions in the way UNIVATIONS does. Consequently, any organisations seeking significant funding from Kauffman Foundation should look to UNIVATIONS as a model programme.

UNIVATIONS employs experiential learning. Programmes in Halle use experiential learning (engaging in real-world projects to launch businesses) as a means of effectively teaching entrepreneurship. Even if some businesses fail the educational mission will be accomplished. Studies have shown that students often learn better by doing that by listening or other more traditional means of education. In addition, learning by doing greatly improves the retention of knowledge and skills.

Finally, the experiential learning gained via UNIVATIONS programmes is much closer to the “real world” than the theoretic approaches of many textbooks. Experiential learning is currently a very hot trend in the US, especially amongst educators in MBA programmes. Several recent conferences in the US attended by MBA programme directors have focused on the theme of experiential learning, which is seen as critical to the future of MBA education. UNIVATIONS provides a great example for other universities to follow.

Recommendations

Universities in Halle should first be advised to keep on doing what they are currently doing. Current programmes represent a model that other institutions should learn from. UNIVATIONS is at the forefront globally of entrepreneurship education because of its focus on interdisciplinary education, inter-institutional co-operation, and experiential learning.

When resources allow it, universities in Halle should capitalise on the interest of large numbers of students from across the faculties to establish rigorous academic programmes in
entrepreneurship that go beyond the relatively haphazard current approach using relatively informal workshops and seminars. While the current approach is outstanding, reliance on extracurricular workshops and networking events could mean inconsistent and spotty coverage of topics that could be better covered in a more traditional academic setting. Appropriate curriculum additions will help students be better prepared to seek capital and operate businesses in the real world. Because of misperceptions about the availability of capital, students should be better trained regarding how to access capital. Each university in Halle must be prepared to hire additional faculty and to provide substantial resources for curriculum development. In addition, efforts should be made to ensure that programmes remain grounded in the real world and that business people participate heavily in mentoring students even if that means hiring professional as well as academic staff. As with any university, the key to accomplishing these goals would be to link entrepreneurship to the mission of the institution.

Entrepreneurship education in Halle should focus more on high-growth businesses and internationalisation. The goal should be to help reinforce a culture for entrepreneurship beyond self-employment. University educated entrepreneurs, particularly those with advanced degrees, should be inspired to think more ambitiously about the potential of businesses they launch. The reasoning behind these recommendations is that high growth, high potential, high technology businesses will have a far greater impact on the economic well being of the region—especially in terms of job creation. It is clear that appropriate technologies and financial resources exist for more ambitious ventures but the culture of high risk, high potential entrepreneurship is not evident. Additional resources will be required to hire faculty and staff with the skills necessary to ramp up these technology commercialisation efforts or to develop these skills in house. In addition, a shift in culture must be proactively pursued.

Given that government funding for UNIVATIONS is guaranteed only through 2007, vigorous effort should be made to endow the programme to ensure its sustainability for the long-term. One option that should be explored would be for UNIVATIONS to take an equity stake in each company it assists. Over the long-term, one major success or a few moderate successes would have a large positive financial impact on the programme. Other options would be to increase financial sponsorships from local businesses.

In order to improve the long term sustainability of the programmes, processes should be designed and implemented to better monitor the economic and social impacts of educational and extracurricular entrepreneurship programs. Currently there are a lot of informal workshops, networking functions and other programs that appear to be working based on anecdotal evidence. However, there is no way to directly measure the impact of these informal programs. Having quantitative measures of results would make it much easier to convince potential sponsors to provide resources for the programs. These data would also help convince other regions of the value of replicating successful programs.

Universities in Halle should recognise the value of intellectual property created as a result of their research, more aggressively protect that intellectual-property, and pursue all possible means of realising the commercial value of that intellectual-property. These Universities are currently missing many opportunities to capture economic value from their intellectual property. To capitalise on underexploited means of commercialisation, universities should work to reduce barriers to professors starting businesses and should, in the long run, provide incentives for professors to start businesses. Incentives might include reduced teaching requirements, equity in start-ups, and royalties from licenses to those start-ups. Furthermore, the institutions should proactively develop an entrepreneurial mindset and skill set amongst professors and administrators. Universities in Halle could benefit from studying examples of how American
universities have responded to the 1980 Bayh-Dole Act. The example of how the University of Illinois at Chicago aggressively launches businesses to commercialise university owned intellectual property should be particularly helpful. Examples show that high technology ventures must involve the inventor if they are to have full legitimacy in the eyes of investors. It is clear that spin-offs from the universities in Halle are handicapped by inability of professor-inventors to joint those businesses.

**International learning models**

*Technology Venture Programme (TVP) – a response to the 1980 U.S. Bayh-Dole Act, University of Illinois at Chicago*

**Description of the approach**

In the U.S. prior to 1980, all intellectual property created from federally funded research was owned by the U.S. Government and, consequently, little was ever commercialised. In 1980 the U.S. Government owned 30,000 patents, but only about 5% led to new or improved products. That year the U.S. Government enacted legislation, called the Bayh-Dole Act, which transferred to universities and businesses exclusive rights to license technologies to other parties or otherwise commercialise their inventions resulting from research funded by federal grants. Furthermore, the Act provided a mandate that the owners of this intellectual property would, in return, make efforts to protect and commercialise these inventions. This Act is widely viewed as one of the most important pieces of legislation in the 20th Century because it provided a profit incentive for universities and their industry partners to work together to bring new products to the marketplace. Numerous technologies have been commercialised as a result.

In response to Bayh-Dole, universities established technology transfer offices (TTOs) charged with managing the process of commercialising technologies. Researchers who discover technologies with potential commercial value are required by law to disclose those inventions to the TTOs at their institutions. Because technologies are discovered using University labs, materials, Ph.D. students, and grants, the intellectual property is owned by the Universities, not the researchers. TTOs independently evaluate invention disclosures and assess whether or not they merit patent protection. If so, the TTO applies for and pays for patents. The TTO then actively seeks to license technologies to businesses. Licensees include large established firms, SMEs, independent start-ups, and start-ups led by the researchers who made the discoveries. Royalties from these licenses are generally divided by the university, its TTO, the researcher whose invention is being commercialised, and the department in which that researcher resides. In general, TTOs would prefer to license technologies to established firms where risks are lower and royalty streams are more immediate. However, established firms generally invest in proven technologies that are well developed and rarely invest in nascent technologies. Furthermore, federal grants typically support only basic scientific research and are rarely available to further develop technologies for commercial applications. As a result of this gap, many early stage technologies have “remained on the shelf” and have not been commercialised.

Recently, American universities have actively engaged in efforts to create and spin off new ventures based on early stage technologies. The intent of such programs is that start up ventures can attract private equity (including venture capital) to fund additional research that would be necessary to develop early stage technologies and take them to the marketplace. The management teams of these start-ups typically include the professor, who invented the technology because the direct involvement of the inventor-professor is critical if investors are to see the start-up as a viable potential investment. This is particularly true in biotechnology and
other high technology sectors. It is generally believed that the inventor-professor must be heavily involved in the details of developing the technology for commercial applications, in the details of gaining regulatory approvals for commercialisation, and in pitching the technology to additional investors and commercial partners. Without the inventor’s full involvement, few high technology start-ups are perceived as legitimate and few succeed in attracting investment. In order to motivate technology professors to devote the time required to assist a start-up, they are allowed to join the management teams of start-up businesses and they are allowed to own equity in those businesses. Without this appeal to their self interest, their involvement would often be perfunctory at best.

In addition to allowing inventor-professors to join management teams of start-ups, the University of Illinois at Chicago (UIC) has taken things even further. In their new Technology Ventures Program, UIC uses teams of graduate students to launch businesses to commercialise promising technologies that would probably otherwise “sit on the shelf.” In Chicago there does not exist a vibrant community of technology SME’s looking for new technologies, nor is there a community of serial entrepreneurs looking for new challenges. Although the Chicago investment community has been hungry for high technology spin-offs coming from the university system, few have been forthcoming. Furthermore, investors are frequently not able to see the potential in raw technologies. Consequently, groups of graduate students (including MBA, MD, Pharmacy, and Engineering students) fill this gap. These groups of students select technologies from amongst the hundreds owned by the university. They then conduct extensive market research and write business plans to explore how best to commercialise those technologies. After negotiating to get the inventor-professor to join their team, they approach investors with their business plan.

In its first year (2005-2006) the program successfully launched two start-ups. One was a biotechnology firm launched to commercialise a revolutionary cancer treatment. The other firm was seeking to bring to market an orthodontic device that dramatically reduced the time required for correcting orthodontic malocclusion (crooked teeth). The program is currently in its second year and is in the process of launching four more high-potential, high technology firms, including: a medical device for non-invasive cornea reshaping, an umbilical cord stem cell technology, a vascular imaging technology and a micro-fluidic device. Each of these businesses will target markets that are worth billions of dollars. Without this program, each of these technologies would remain “on the shelf”—out of view of potential investors. In just over one year, UIC’s program has received national attention from the media, peer institutions, and investment groups.

Why the approach is relevant to Halle

Although the UNIVATIONS program at Halle is an excellent model program to transfer to many other locations, the program has thus far focused on student-owned businesses which are relatively limited in growth potential. By integrating the UIC Technology Ventures Program (UIC TVP) model along with the current UNIVATIONS infrastructure, Halle could develop a program that would gain international acclaim as well as contribute even more to the regional economy. Although professors in Germany are currently prohibited from launching businesses, new laws are expected to pass soon that will give them that right in the near future. University officials, investors, and service providers should think big and gear up in advance of these legal changes. With the infrastructure in place, Halle would be able to “hit the ground running” when the time comes to commercialise university-based high technologies that require involvement of the inventor-professor.
Reasons for the success of the approach

Several things contribute to the success of the UIC TVP. UIC is one of the top research institutions in the US in terms of federally funded research. As a result, the university owns hundreds of technologies with great commercial potential. Furthermore, UIC has great strengths in the life sciences and a solid reputation in these fields. This depth of expertise leads to quality inventions, strong connections to established firms in the biotechnology industry, and legitimacy in the eyes of potential investors and external partners. However, UIC has historically launched very few university spin-offs. In addition, Chicago has historically not been known as a hotbed of entrepreneurship. Consequently, amongst investors there was a lot of pent up demand for good high technology deals. UIC’s TVP was established to fill a specific gap and provide a mechanism to bring high potential technologies to the attention of hungry investors.

The program received strong support from all levels of administration at the university, which added more legitimacy to the program and, thereby, contributed to its success. Furthermore, student teams who work on technology ventures projects actually own the company that has the option to license that technology. That gives them very strong incentives to work hard to make the project work and to actually launch the business they plan for. Once student teams have formulated a plan they must negotiate with the inventor-professors to bring them into the company. If they can’t do so successfully, then the business will fail. If they are able to come to agreeable terms with the inventor, then the inventor joins them and takes an equity stake in the new business. Therefore, the inventor has a strong self interest in helping the company succeed.

This sets that stage for a classic win-win situation. The university wins because technologies get licensed that might otherwise sit on the shelf and produce no value. Some of these technologies will inevitably provide royalties to the university. Inventors win because they gain equity in a start-up that has far greater access to capital markets than they would have if they started out on their own. Students win because they engage in a remarkable learning experience even if it doesn’t work out, plus they get to own a real business that has definite potential. Investors win because the university provides them with pre-screened business plans that are a good fit for what they are seeking.

The obstacles that were faced and considerations for adoption of this type of approach in Halle

The UIC TVP faced several important obstacles. Despite voicing great interest in such deals, local investors often were not well qualified to judge business plans related to the life sciences. Consequently they were overly risk averse and reluctant to seriously consider investing in biotechnology or medical devices. Consequently, businesses launched through the UIC TVP received much stronger interest from investors in California and Boston, and one was ultimately funded by a firm in Texas. Although several factors added legitimacy to the UIC TVP, many people in the press, business community and investment community had a hard time seeing student-owned businesses as fully legitimate. It was a constant struggle to convince all interested parties that the students were the right people for the job at that time, and that the students were all prepared to step aside at the appropriate time when professional managers could be successfully recruited. A final major obstacle is the amount of work the TVP requires of students. Those who engage in the program typically have little time for anything else for nearly a full year.

This program could be transferred rather easily to Halle given the infrastructure already in place in terms of UNIVATIONS and other programs that currently bridge the university with
investors and the business community. Furthermore, Halle has a great depth of expertise in several technical areas, including the biosciences. Halle has the potential to be at the cutting edge of technology commercialisation if leaders there are proactive and do not just wait for technology ventures to evolve organically. One obstacle will be the established culture amongst professors of not engaging in start-ups. Even when the laws are changed to allow such participation, many scientific fields have historically valued basic research much higher than the type of applied research necessary to commercialise a technology. It will take proactive effort to change this culture and to educate inventor-professors in order to secure their critical involvement.

**Contact details and website for further information**

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**San Diego CONNECT, United States of America**

**Description of the approach**

San Diego CONNECT was established to facilitate the transfer of technologies from universities to industry. This program provides another rich model that could be adapted to enhance technology transfer in and around Halle. Although much of what UNIVATIONS does mimics the programs of CONNECT, a careful comparison of the two programs will undoubtedly lead to insights regarding how to strengthen UNIVATIONS and make a great program even better.

San Diego, California has proactively and aggressively become one of the most innovative places in the world. They have transformed their economy from one relying on defense contracts and tourism into one that is based significantly on academic research and high technology (primarily biotechnology and telecommunications). At the centre of this economic reinvention were the University of California, San Diego (UCSD) and its CONNECT program. UCSD CONNECT is a deliberately developed network of professional competencies focused on building shared knowledge and facilitating entrepreneurial teams to establish and build entrepreneurial companies. UCSD CONNECT has developed outreach activities and programs that link science to business. Outreach activities include workshops, seminars, networking events, and awards programs.

San Diego has several research institutions (UCSD, Scripps Research Institute, Salk Institute, The Neurosciences Institute and others) that annually conduct in excess of USD 2 billion worth of basic research. These institutions produce a great deal of valuable intellectual property (IP). In order to commercialise this IP, UCSD CONNECT brings together researchers, entrepreneurs, investors, and the business community in order to form social networks to connect these disparate groups. These networks facilitated mutually beneficial learning that has resulted in increased competency. They also provided entrepreneurial firms with greater access to resources. This increased access to capital and expertise has been credited with helping stimulate the founding of numerous new companies and the creation of thousands of jobs in the telecommunications and biotechnology industries in San Diego. Furthermore, UCSD
CONNECT has been replicated in other cities in California, Hawaii, New York, and several other countries.

Over 1,000 companies now participate in CONNECT and its programs are fully funded by membership fees, sponsorships and fees for services.

**Why the approach is relevant to Halle**

Halle has already developed networks for inventors, entrepreneurs, investors, and service providers, however, a careful examination of the CONNECT model should provide insights into ways that Halle can do things even better. Like San Diego, Halle has great strength in several highly commercialisable technical areas. Like San Diego, Halle is somewhat geographically isolated. Like San Diego, Halle must proactively create a climate for innovation and entrepreneurship.

**Reasons for the success of the approach**

Participants in UCSD CONNECT have cited several factors that contributed to the network’s remarkable success. First, a severe cutback in military spending resulted in a serious economic downturn in San Diego. This created the need for new industries in the area. Secondly, CONNECT was very successful at creating an atmosphere of trust amongst participants. Third, San Diego had a critical mass of service providers such as IP attorneys and business planners, who could quickly put deals together. Ultimately, CONNECT participants have concluded that innovation is a social process that relies on interaction, serendipity, trust, and the exchange of tacit knowledge.

**The obstacles that were faced and the quality of the response taken**

What makes the CONNECT model compelling is that it has been far more successful than other programs at stimulating lasting economic development. While many similar attempts to create viable networks to stimulate the creation of new ventures, most have, over time, degenerated into social clubs or “shark tanks” full of attorneys, accountants and other service providers looking to make a few quick dollars. Because San Diego’s CONNECT program was born of necessity it benefited from a rapid “buy in” from all relevant parties who saw participation as their best option. Other cities, like Chicago, do not face the same economic challenges San Diego faced and, therefore, do not have the same sense of urgency that leads to enthusiastic participation in new networks. The biggest challenges faced by any city seeking to implement a similar program would include getting relevant parties to participate fully, getting participants to trust one another adequately, and keeping programs focused on their missions so that they do not degenerate into social clubs or shark tanks.

**Considerations for adoption of this type of approach in Halle**

Halle already has an impressively successful network for entrepreneurship. However, that network is young and not necessarily focused on high technology. Most of the entrepreneurship in Halle remains in the form of sole proprietorship. If Halle is to move forward in a dramatic way, there must be a shift towards more technology-oriented and more high-growth potential businesses. UCSD CONNECT provides an excellent model for how to adapt current programs in Halle to meet these new challenges.
Contact details and website for further information

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Further reading
INFRASTRUCTURE FOR INNOVATIONS AND INTERNATIONALISATION OF SME ACTIVITY

By Petr Adamek, Czech Republic

Introduction

Theoretical studies and empirical evidence on economic development policies show that sustainability of jobs and levels of private sector investments in a locality depend heavily on the competitiveness of national, regional and local economies. Local economies can be considered competitive when private sector operations conducted in these areas result in outputs that are consumed beyond the local economy, preferably at a global level. There are a number of preconditions that enable places to be competitive, including a supportive institutional framework and a pro-active public sector. It is the quality of interactions and linkages between individual firms and collaborative alliances that can generate a contribution in meeting global demand in a faster and more customer-oriented approach, which, ultimately, could make a difference in the competition for global economic resources.

The link between entrepreneurship, innovation, competitiveness and local economic development is through productivity of the private sector. Thus private sector should not only be perceived as an object of support, but seen in its primary role as a key driver of local economic development. Firms are founded and developed (entrepreneurship) because they represent a valuable source of wealth for their owners. Entrepreneurs and their agents maximise firm value by maximising input-output functions of their operations (productivity), typically by introducing new products and processes (innovation). If firms in one particular locality are able to introduce product and process innovations more rapidly into (global) markets, compared to firms located elsewhere, the area experiences an increased competitive advantage (competitiveness) that facilitates attraction of new resources and contributes to raising incomes and improved standards of living (economic development). Public sector led local economic development activity with the aim to increase entrepreneurship and innovation levels should thus not forget about the global market orientation of local development activities and actors. Firms also internationalise their activities with regard to the production input side, for example sourcing of specialist research knowledge, problem solving expertise or special equipment that does not exist locally, but is needed in order for the firm, the product or the invention to succeed internationally.

Infrastructure for innovation is a complex system of physical, human and financial resources, including competences, capacities, capabilities and networks that support innovative firms in processes of knowledge commercialisation. To develop a local knowledge economy successfully, a good balance between the two key innovation subsystems, of knowledge generation and knowledge exploitation, needs to be maintained. The role of public sector is critical in forming the knowledge generation subsystem by providing infrastructure, financing and conducive conditions for human resource development. The significance of private sector increases with the transfer of basic research knowledge to the knowledge exploitation subsystem, which ultimately targets consumers in the global market (see Figure 1).
There are many ways of public sector intervention. The challenge is to identify the most strategic intervention schemes that best fit locally. Public sector involvement should be strategic. If access to specialised public sector provided infrastructure is given to few beneficiaries only, it is unavailable at the same time for others. Opportunity costs are associated with exclusive allocation of support. When the public sector decides to develop and operate 3 000 sq meters of world-class biotech incubator space with services, like joint laboratories, industry expertise advisory services, business development consulting capacity, intelligent facility management, using public resources, this can indeed add a critical component to the local innovation system, which is necessary for local innovators to achieve global success. However, it is likely that numerous applicants are interested in using this space and the services offered. These applicants differ in terms of their potentials and their abilities and capacities to deliver commercially viable innovative solutions. Given the limitations in space and services available, access to the publicly-funded infrastructure will thus need to be restricted, and requires careful selection of firms. Speaking in general terms, this could create uneven conditions among start-up companies. Choices made by the public sector should therefore be justified by the results of careful strategic expert analysis, also taking into account the long-term net present value of the projects submitted in order to minimise associated opportunity costs.

Figure 1
Regional innovative infrastructure framework

The focus of innovation infrastructure should not be exclusively on future start-ups and spin-offs. In some cases new firm formation is the most beneficial strategy, firstly, because the positive socio-economic impact remains within the economy, and, secondly, the firm can represent an important future resource for innovations. For many reasons, the phase in which an idea turns from its pre-competitive stage to a commercially viable idea (intellectual capital), which can be associated with a business plan and end user global markets, can be considered critical for local economies. If the support infrastructure is not able to protect local strategic interests at this stage, local economies risk to become net contributors to a global knowledge exchange without reciprocal rewards that are essential to justify public and private resources invested in the knowledge generation subsystem. The potential to take ideas to global markets is, however, higher with already existing firms than with start-ups and university spin-offs.
Multinational companies, in particular, with their access to markets represent an opportunity for local economies to accelerate and scale up commercialisation in a faster way than by nurturing conventional firm starting from zero. Attention must then be paid at protection of intellectual property and choices of value release strategies that can range from joint venture arrangements, through licensing to complete divestments (sale of IP).

The regional innovation infrastructure should include facilities and associated support services tailored to the different strategic needs of companies throughout the stages of firm formation and business growth. Generally speaking, these include pre-start-up phase (forecasting, market intelligence and demand scan, business planning, capital raising, patenting, etc.), start-up and early growth (business registration, strategic planning, human resource development, marketing and public relation, line function development, supplier testing and sourcing, initial production process set up, identification of sales and distribution channels, etc.), and full scale-up (maintenance and extension of sales and distribution channels, international contracting, sourcing and sales, quality control, potential outward foreign direct investment, etc.). Firms in different technology domains and industries are confronted with different forms of competition, their product life cycles have different durations and paths, and they require different skills and equipment, as well as different physical infrastructure and support services. This provides the rationale for public intervention that is to provide opportunities associated with respective international competitive advantages and access to and positioning on global growth markets.

From an economic development perspective it makes sense to focus public support on developing industries that have demonstrated ability to compete internationally and have outputs that are targeted at global growing markets. In other words, it is rational for the public sector to identify and prioritise key strategic industries and value chains in which to develop industry specialised infrastructure that purposely serves start-ups, local growing SMEs and attracts external firms to tap into the local unique knowledge generation system. Innovation infrastructure should therefore provide access to specialised resources for firms in industries and technology domains, where the local economy has its highest potential competitive advantage globally and which are hard to replicate elsewhere. It is important to maintain and build on local specialisation, and also to avoid relocation of the system or its components, which could result in a devaluation of public investment. The location specialisation should not only be based on historical traditions and existing assets, such as the presence of local HEIs or industrial heritage, it should rather build on them with regard to future global market developments and their impact on a competitive positioning of locally created private sector growth activities.

**Strengths and weaknesses**

The following strengths and weaknesses have been identified on the basis of interviews conducted with local entrepreneurs, University professors, representatives from local and Land governments, economic developers and business support institution specialists. They reflect the perception of the author and his understanding of the situation rather than being based on sound data and result of detailed analysis.

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12 The Land Saxony-Anhalt seems to concentrate its public support on private sector activity in strategic areas of industry, like chemistry, machinery and production systems, biotechnology, engineering, medicine, information and communication technology and new media. The strategic orientation seem to build on a previous industry focus, concentration of knowledge and competencies in local firms, and the presence of local universities and research institutions. The information available did not reveal whether these strategic sectors have been identified on the
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basis of their current and/or forecasted global market performance, and in relation to other regions' specialisations.

The proclaimed industry specialisation has a significant impact on Halle economic development efforts. In the light of the above outlined rationale of strategic orientation of public economic development policy, Halle need to further develop its priorities. Halle has inherited an image of being an industrial city with a surrounding region that is perceived as previous chemical industry agglomeration. This might hinder the efforts of Halle and the surrounding region in attracting talents from elsewhere to live and engage in science and entrepreneurial activities in Halle. It can be seen positively that public and private sectors join their efforts in addressing image problems and in raising the attractiveness of the city and its surroundings as business location.

The City of Halle and the Land Saxony-Anhalt work closely together in encouraging and intensifying co-operation amongst key components of the local innovation system, which include HEIs, prestigious research institutes, Technology and Company Founder Centres (Technologie- und Gründerzentren), the “Weinberg Campus” network, the Chamber of Commerce and Industry Halle Dessau and other business support services, in order to enhance innovation and technology development and facilitate commercial exploitation. Halle provides an excellent physical infrastructure, and offers, in particular with the Weinberg campus, opportunities for innovative firms to locate in proximity to universities and research, and closely to other firms in related industries. The aim is to raise the technological level of the region by encouraging intense co-operation between private firms, R&D organisations and universities in the area of generation and commercial exploitation of high-tech innovations in industries that are strategically important for the competitiveness of the region. The infrastructure seems to be well fitting to current needs.

The Martin Luther University Halle-Wittenberg is central to the knowledge generation subsystem and also plays an important role in knowledge exploitation. The University has built up long-term strategic core competences in natural sciences, both in basic and applied research. The University also hosts the local co-ordination office of UNIVATIONS, a highly connected network of four HEIs, stimulates the generation of business ideas from an early stage and provides assistance during pre-start-up and start-up phases. Students and graduates are accompanied by expert advice, general and problem oriented training and first contacts with public and private funding sources.

Impressive public investment, using Federal, Land and EU support, has been made in the past in physical facilities, something that would have not been possible on the basis of locally available resources only. Financial support and counselling for firm start-ups and digressive financing for early development in incubator type facilities is available. However, interviewed entrepreneurs anticipate a decrease in the availability of public sector financing for incubator projects. There is a risk that this might result in reduced numbers of new firm formations, higher death rates of firms in critical development phases and potentially less full scale-up success stories.

Currently, the local enterprise support environment shows the following functional components:

- **Stages of firm development**: there is support delivered during the pre-start up and start-up phases by initiatives like FUTUREGO and UNIVATIONS, but less assistance seem to be provided for the full scale-up process.
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- **Sectoral focus**: there are specialised competence centres and services, like Bio Centre and BioService, but a Halle-specific scientific sub-domain specialisation seem to be missing, or at least not been significantly communicated to a wider relevant audience.

- **Value release strategy**: an emphasis seem to be on new firm formation support, delivered by UNIVATIONS, but models of existing firm take up and external firm take up seem to be relatively under assisted.

On the strategic orientation of the approach, it can be said that anecdotal evidence from the interviews, with examples of foreign acquisition of a technology business idea, suggests the need for a greater emphasis on efforts to further embed companies in the locality should be intensified in order to retain knowledge-intensive and high-value activities in the region despite good reasons for settlement and expansion elsewhere. The "Mitteldeutsche Informations-, Patent-, Online-Service GmbH", a subsidiary company of the Chamber of Commerce and Trade Halle-Dessau, offers first expert information on patent issues and free-of-charge access to international patent databases as well as long-term advice and counselling by specialised lawyers.

The Chamber of Commerce and Trade Halle-Dessau plays an important role in supporting SME internationalisation and innovations. The services provided by Chamber of Commerce and Trade are that of standard support in facilitating the internationalisation of business activities. Services provided to Chamber members includes in addition to promotion and marketing, assisted attendance of trade fairs and business missions, also monitoring and evaluation of business activities. The German Chambers of Commerce (Deutsche Auslandshandelskammern) network of offices abroad, one of the largest networks of this kind world-wide, provides opportunities for international market-led firms to utilise presence, experience and contacts of these offices and their expert staff abroad. Today, 93 offices in 84 countries are operated by the network. They provide trade related advisory services on market opportunities to interested German firms and facilitate business connections between companies in the host country and Germany. The Chamber of Commerce and Trade Halle-Dessau runs a pilot programme for 40 businesses, called "Fit for Export", with the aim of increasing local company responsiveness on international markets. However, other than the pilot "Fit for Export" programme, there seem to be only little horizontal focus, and systematic approach in fostering the internationalisation of the locally invented knowledge.

**Good practice in Halle**

*The University network*

The Martin Luther University Halle-Wittenberg is central to the knowledge generation subsystem and also plays an important role in knowledge exploitation. The university has built up long-term strategic core competences in natural sciences, both in basic and applied research and plays an important role in orchestrating and initiating innovation in its main field of scientific competence. Activities in pre-start-up and start-up phases of new firms are exceptionally intensive and have demonstrated successful track record. There are three interrelated schemes that focus on three different stages of new firm formation:

- **FUTUREGO** targets mainly pre-university students (aged 14-21) in promoting an understanding of and positive attitudes towards entrepreneurship.

13 For further information, see http://www.ahk.de.
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- **UNIVATIONS** is a specialised start-up assistance institution that helps to generate, and conceptualise viable business ideas with University student teams and ensure a seamless development during pre-start-up and start-up phases.

- **Institute for Innovations and Entrepreneurship**, a newly established institute related to the University, conducts applied research on the needs and mainstream challenges for SME development in Halle and its surrounding region. The Institute aims at contributing to firm development after the start-up phase by identifying crucial barriers faced when increasing productivity and enhancing competitiveness.

It can be mentioned as good practice that the business community is been involved in all above mentioned activities. The role of UNIVATIONS and the existence of a co-ordinator in each of the four participating HEIs can be underlined in its importance. This enhances co-ordination and integration of efforts, which seems to be successful in achieving higher efficiency and effectiveness of the services offered.

**Research institutes**

Prestigious research institutions, such as the *Fraunhofer Institute, Max Planck Institute, Leibniz Institute* and other centres of excellence, contribute to the generation and application of local innovative capacity and competitiveness by utilising local knowledge and skills and attracting new resources. The *Fraunhofer Institute* focuses on applied research and is an important source of R&D competence for companies in the region. The *Max Planck Institute* for Microstructure Physics specialises mostly in basic research and runs a research centre on enzymology and protein studies.

*Technology focused incubation centres: "Technologie- und Gründerzentren"*

In Halle new firm formation and existing firm take-up seem to be the preferred value release model for accumulated intellectual capital. In Technology and Company Founder Centres (*Technologie und Gründerzentren*) testing facilities are offered for spin-offs prior to start-up and shortly afterwards. This has the advantage of selecting companies for additional support and business plan finalisation that do not yet have mature markets. Assistance at pre-incubation, pre-start-up and start-up levels seem to have an industry specific focus. Existing horizontal initiatives to ensure a pipelining of business ideas seem to have a strong technology orientation.

*Technology Park Weinberg Campus*

The Technology Park Weinberg "Weinberg Campus", a growing large-scale physical infrastructure, is an impressive example of a well developed, strategically specialised knowledge exploitation system. It offers its facilities mainly for the commercialisation of business ideas resulting from research conducted at universities, research institutes, and local firms. It also strengthens co-operation and collaboration amongst players in the local innovation system.

Fast facts about the Weinberg campus:

- 3 Technology and Company Founders Centres (TGZs) located on the Weinberg Campus;
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• Since 1990 the level investment has reached € 735 million, with an estimated increase of another € 130 million planned and committed for 2008;

• 120 start-ups of which 10-15 are still located in the centres;

• 56 institutes are on the campus;

• 35% chemistry firms, 20% operating in the field of biomedicine, the remaining companies are working in nanotechnology, IT, and other sectors;

• Approximately 2 000 employees from the University and 1 000 employees from companies

• Since 2004 international study visits have been conducted to well-known places for technology transfer, like Canada and Singapore, which contributed to the conclusion of 6 international technology transfer agreements foreign partners.

BioCentre and Bio-Service GmbH

The BioCentre has been started by the University in strategic partnership with the private sector with the aim to concentrate knowledge and competence in biology, biotechnology, pharmacy and related science. The BioCentre and its further development into a private company structure, Bio-Service GmbH with a greater organisational flexibility, is a network of currently 63 members including entrepreneurs, CEOs of companies, professors, researchers from Halle and technology poles elsewhere (e.g. Munich). The centre receives EU funding under the condition of achieving at least 50% private firm activities. This firm currently employs 30 people, solicits ideas from University and provides services on the way to market in life sciences.

Recommendations

It is in the interest of the Land Saxony-Anhalt, the City of Halle, the regional university network, and the technology oriented start-ups and local SMEs that their products and services reach international markets in the shortest possible time. Besides time-to-market, the scale of activity on the markets also matters because it influences the time-to-money measure, which is essential for the financiers, in particular venture capitalist providers and their networks, who associate higher risk with longer development periods.

Narrowing the current specialisation of innovation infrastructure. The current areas of core innovation competence seem to be too broad in their definition and are followed by many other regions in Europe. In order to enable the crystallisation of a Halle-specific global competitive advantage, the development of a more sophisticated cluster approach in activities where Halle and its surrounding region already have demonstrated international success is recommended. This could help prepare more focused strategic project selection approach and prioritization in terms of level of support. This recommendation is illustrated by the learning model on the National Cluster Study in the Czech Republic.

The recommendations are relevant only to the extent to which they have not been already considered, evaluated and adopted or rejected for reasons unknown to the author.
Adopt a more strategic approach in project selection and information dissemination. Priority setting in innovation infrastructure must be future oriented. The support services need a stronger reference to, partially already introduced, criteria like technological level, coherence with strategic core competences of the region, potential for value added, export orientation and, most importantly, global market potential. The impact of business internationalisation activities on the local economy in Halle and the surrounding region could be used for promotional campaigns like “Halle goes global”.

Identify complementary strategic assets. The physical infrastructure for innovations in Halle seems to be in a good shape. However, there are missing or underrepresented components in the broader innovation support infrastructure, like specialist equipment providers and research specialists. Efforts should be made to identify such assets in other locations within Germany or abroad and to create connections with them. A well functioning network including industry experts is needed to conduct a detailed inventory and assessment of local strategic complementary assets. It is important to develop and maintain mechanisms that allow for an acceleration of time-to-market and time-to-money procedures of locally generated innovation.

Extend public support measures to the post-incubation period. It seems that pre-incubation, pre-start-up and start-up level assistance is available for those who have business ideas and horizontal initiatives exist (FUTUREGO, business planning competition) to ensure the pipeline of business ideas and establish a culture of entrepreneurship in Halle and the region. The idea of a follow up institution or service that will directly assist firms in post-incubation period is right on target and in terms of resource allocation, it should become a priority. Even though the Institute for Entrepreneurship and Innovation is mainly research oriented, it can perhaps become a more pro-active partner for the firms that successfully leave the incubation period and become regular small firms that nevertheless require specific knowledge and expertise that is often external to them. Current support activities for firms in the post-incubation period need to be continued and intensified. The strategic objective of public support measures should not only be on preventing firm collapse caused by a lack of know-how in growth management and crises in growth processes, but also to ensure that firm growth is in alignment with the strategic interests of the city, the local science community and the region. Efforts to further embed companies in the locality should be intensified in order to retain knowledge-intensive and high-value activities in the region despite good reasons for settlement and expansion elsewhere. It is not easy to do this and there is no one single recipe that can work everywhere, however a useful concept is introduced with the international learning model on it is in Scotland.

Increase private involvement in infrastructure development. Whilst public subsidy and support may continue for enterprise promotion in Halle for a long time to come, it is strongly recommended that private finance is introduced into the real estate component of the enterprise strategy as speedily as possible. In addressing future needs of companies for a greater diversity in quality and size of physical innovation infrastructure, private high-tech facility developers and managers should be consulted, at an increased level of current involvement, and potentially attracted to develop and operate space. For the future viability of these facilities it will be important to see the real estate as an asset capable of producing a commercial return, against which maybe also further funds could be secured. Successful firms will need to develop rapidly in the next years. A five person firm might need space for 100 employees in the next three years if their new product market entry proves successful. Places like the Weinberg Campus must be ready for this, otherwise there might be a risk that successful start-ups will seek space and people elsewhere.
Exploitation of innovation through a wider group of firms. The existing innovation infrastructure should be used more intensively to foster collaboration between HEIs and local companies of all sizes as well as with large companies located elsewhere but with relevance for the local value-chains. The university environment in Halle is very active and is a clear leader and orchestrator of innovative activity in the area. A focus of start-up support measures on knowledge and technology transfer into technology and growth oriented start-ups is already visible. Previous strategy has been based on pushing innovations by new firm formation. Currently there is a full cycle being developed with new focus on post-incubation. However, the role of the Universities and the already functioning innovation system could be also to pull ideas from existing industrial firms, SMEs and large companies, those that have not been assisted by UNIVATIONS or created by professors on campus, have their customer base or feed directly in relevant value chains and thus any locally created innovation could be readily tested with the markets. The same applies for foreign companies being present in the region, but also firms located abroad with activities relevant for the local value-chain and for a further specialisation of innovative firms in Halle. Co-operation with multinational companies can help to accelerate and scale-up commercialisation processes because of their strong access to markets. During the visit to Halle the review panel met with a firm that tested an innovative data-projector related pointer device that could be delivered to market faster (or dropped because it already exists, which is also an option that must be carefully considered prior to investment in any innovative activity), if co-operation were initiated at an early stage with market leaders.

International Learning Models

Intermediary Technology Institutes (ITI), Scotland

Description of the approach

Intermediary Technology Institutes (ITIs) were created in Scotland in 2002 with the aim of building on the strengths of the Scottish economy. A particular emphasis is on Scottish universities, research institutes, as well as on existing and nascent SME in the fields of digital media, life sciences and energy sectors. ITIs fulfil a co-ordinating task that helps to identify, commission, and/or acquire and diffuse pre-competitive research. Government funding has been committed for a period of ten years (Scottish Enterprise committed a GBP 450 million investment in the ITIs over the next 10 years). This reflects, besides other reasons, the long period that it takes for R&D discoveries, for example in the field of life sciences, to achieve market realisation.

The approach of ITI seeks to anticipate market developments through pre-competitive research, by identifying future global markets, rather than simply reviewing a proposal and awarding requested funding in turn of waiting for results. The role of ITIs is to provide from the earliest possible moment on hands-on support in innovation processes. ITIs undertake market foresight exercises, focused technology development, and manage intellectual assets to maximise the commercial and economic return to Scotland. ITIs are open to all companies and research institutes willing to participate in their programmes.

A total of three ITIs have been established in Glasgow, Dundee and Aberdeen, each employing a team of between 15 and 20 experts with long standing experience in early stage research, technology development, intellectual asset management, technology marketing, deal-

15 Information material for this case study originates from web research and discussions between the author and Ewen Peters, Ewen Peters Associates, Scotland.
making, and company formation and development. The three ITIs work together with the central office in Glasgow (ITI Operations) that provides co-ordinated services in human resource management, finance, corporate and legal affairs, and knowledge management under the objective of ensuring a co-operative, efficient work environment, simplifying procedures and cutting transaction costs.

The three ITIs have each an individual emphasis on life sciences, energy and communications technology and digital media: "ITI Techmedia", "ITI Life Sciences", and "ITI Energy". The process of knowledge generation and exploitation as it is managed by the ITIs incorporates the following phases:

1. **Foresighting** – this includes activities related to: business and market environment scan; market intelligence; identification of intellectual capital potentials;

2. **Programme development** – this includes activities related to: scoping, diligence, conceptual design, phasing of ideas;

3. **Programme management** – this includes activities related to: research agenda, intellectual capital accumulated and protected; and,

4. **Value release** – this includes activities related to: decision making on value release strategies – new firm formation, licensing, complete divestment according to pre-set criteria.

The ITIs seek to address the market failure which exists in taking 'good' ideas forward to commercial application, what is called the innovation’s 'valley of death'. The ITIs provide resources, competences and expertise that SMEs often lack. ITIs help to reduce risks during the innovation process by providing information and expert support from the earliest point possible. Nevertheless, an ITI is not a 'bricks and mortar' research laboratory, a substitute for company-driven research, or a replacement for fundamental research.

The operational outcomes for the period 2004/05 included: 13 Market Intelligence and Foresighting Reports published; 11 R&D Programmes commissioned (against a target of 9); 21 Programme participants (against a target of 11), with more than 50% Scottish-based; over GBP 70 million funds committed; 230 members, with more than 50% Scottish-based – 87 companies joined in 2004/5 (against a target of 65); and 95% of expert staff recruited has previous careers in industry.

A range of programmes are being developed and implemented by the ITIs. In the following a selection of 'early' winners are briefly described.16

- Cardio Bio-Markers Programme. "ITI Life Sciences" committed GBP 30 million over 3 years to help develop next-generation biomarkers. This has attracted a US-based company, Inverness Medical Innovations, which plans to invest GBP 37.5 million over 3 years to develop diagnostic test kits – and GBP 30 million in manufacturing, with the creation of 500 new jobs anticipated.

16 For further general information, see www.itiscotland.com and, in particular on current programmes, see http://www.itiscotland.com/defaultpage131abcede0.aspx?pageID=772.
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- Lithium-ion Battery Technology. "ITI Energy" committed GBP 4 million to a collaborative programme involving Scottish SMEs (Mpower, Axeon) and St Andrews University. Lithium rechargeable battery market is projected to be worth GBP 7 billion by 2015.

- Sensors and networks technology. "ITI Techmedia" committed GBP 4.75 million to a condition-based monitoring programme that will create sensors and networks platforms which allows for condition-based monitoring and predictive interventions, with potential applications in a wide range of industries and sectors.

An interim evaluation of the work of ITIs has shown that indigenous SME participation and created learning benefits, in terms of intellectual audit management, intellectual property protection and accessing specialised complementary assets meets the expectations. The average costs for a 3-year R&D programmes exceed with the amount of GBP 3-5 million, the initially planned budget of GBP 1-3 million. Nevertheless, the expectation of achieving a self funding rate of 40% after 10 years of operation, seem to be feasible. The ITIs are managing currently 10-15 R&D programmes per year, this is less than expected (20 programmes per year). They are completing 3-5 commercialisation deals per annum. Early success has recently been endorsed by the Scottish Parliament and the the Committee for Enterprise and Culture – has called for a doubling of ITI funding and extension of the model to other priority clusters.

Why the approach is relevant to Halle/to East Germany?

Scotland realised that it needs to specialise and rationalise its expenditures into pre-competitive research in order to achieve higher levels of international competitiveness. Scotland also realised that its economic growth and success rests with the ability of local firms to access international markets. The situation of East Germany and its position within Germany and Europe can not be routinely compared with the situation of Scotland within the UK and Europe, however, there are similarities and analogies that make the experience of Scottish ITIs relevant for Halle and East Germany. These include high ambitions of metropolitan areas and a belief of private firms and public organisations in these areas together with the joint understanding that the future of economic success lies in knowledge generation and its commercial exploitation. Halle is moving forward on its way to become an important technology pole in the region. Hence new ways should be explored on how (i) to foster specialisation in Halle's specific scientific domains, (ii) to extend assistance and focus on post-incubation, and (iii) to emphasise an international market orientation of the local innovation support system in Halle. The Scottish ITI experience represents a valuable learning model for these efforts.

Reasons for the success of the approach

One of the main reasons for success of ITIs' work is related to their close relationships with both public and private stakeholders. The ITIs are members of Connect Scotland, Library House, the Scottish Council for Development and Industry (SCDI), the Scottish Chambers of Commerce in Glasgow, Dundee and Aberdeen, the Scottish North-American Business Council and CBI Scotland. The ITIs together maintain a network of relationships with 200 companies, both SMEs and multinationals, representing both the Scottish and the international business community and leading companies for technology development in the very sectors. Venture capitalists are also represented. On-line application for membership is possible. A membership to the ITIs offers the opportunity to participate in regular members-only meetings that offer early insights into identified business opportunities and access to a global network of experts and world class technology development. Members are offered the exclusive opportunity to participate in R&D...
programmes. Membership requires full association with the organisation and participation in funding of its activities. Membership typically costs GBP 400, plus VAT, and runs from April 1st to March 31st annually.

Through programme participation, Members can spread the risk associated with innovation and investment. Programme participants can benefit from a prior evaluation of the viability of the programme, based on solid market foresighting. ITI assumes the direct costs of a programme for participants although joint funding arrangements are also possible. ITI offers access to newly-generated intellectual property through active involvement in the programme. Participating companies have an early view of its output and the right of first refusal to new opportunities arising from the R&D. This way firms and organisations in Scotland are offered access to leading-edge technology platforms with concrete support to benefit or contribute to a wide range of technologies. All initiatives to date have successfully combined Scottish and global expertise. In particular, SMEs are offered access to ideas that would normally be out of their reach.

The obstacles that were faced and the quality of the response taken

When Scotland moved into the new economy it struggled to retain its competitiveness in an international environment. In 2000, the productivity gap for Scotland was estimated at minus 30%-40% behind the US; for Germany the gap amounted to minus 20%-30%). Entrepreneurial vitality, measure by new firm formation level, was in Scotland only 75% of the UK rate. There were only few innovative high-growth technology start-ups in Scotland: 50 hi-tech start-ups per million persons compared to Massachusetts, US with 180 hi-tech start-ups per million persons. In many cases these high-tech start-ups in Scotland have been acquired by multinationals without leaving behind benefits for Scotland and the respective localities. The level of business expenditures on R&D in Scotland were with approximately 0.6% of GDP only half of the EU average with 1.24% of GDP. Scottish firms performed below average in terms of their share in UK patents, and offered only limited career opportunities for science/technology graduates. In general business clusters in Scotland lacked critical mass, relevant R&D intensity and missed strong local linkages. Overall, the absorption capacity for EU/UK government support for R&D was also unsatisfactory.

The here discussed Intermediary Technology Institutes (ITIs) form one of the key components of Scottish Enterprise’s approach to strengthening innovation and R&D in Scotland. The aim is (i) to create and expand the number of high growth, high value technology companies, (ii) to attract and expand foreign direct investment that is linked to knowledge and retained skills, and (iii) to nurture strong technical, entrepreneurial and flexible skills to create a fertile environment for growth. The ITIs were an ambitious next step that followed the previous strategies, initiatives and economic development tools. The important prerequisite for success was a long term commitment of the political leaders expressed in a ten year budget for these efforts.

Considerations for adoption of this type of approach in Halle and in East Germany

The establishment of this kind of agency in Saxony-Anhalt could be discussed as a way of increasing public-private partnership in knowledge generation and knowledge exploitation. The local innovation support system in Halle offers promising starting points for a local outreach of a centralised system like ITI. A potential role of the Institute for Entrepreneurship and Innovation at the University of Halle and UNIVATIONS network could be relevant to this end. The ITI example in Scotland demonstrate the importance given to a substantial amount of public funding
available to initiate these kind of co-operations, and the relevance of a functioning co-operation between private and public stakeholders in innovation support.

Website for further information

Scottish Enterprise  www.scottishenterprise.com
Intermediary Technology www.itiscotland.com/
Institute Scotland (ITI)
ITI Life Sciences  www.itilifesciences.com/
ITI Energy  www.itieenergy.com/
ITI Techmedia  www.ititechmedia.com/
Further reading on ITI Scotland www.scottish-enterprise.com/publications/iti_scotland_- _realising_scotlands_potential.pdf

National Cluster Study, Czech Republic

Description of the approach (aims, delivery, budget etc)

The Czech Republic strives to develop a high-performance national economy based on skills and knowledge and a positive business environment supporting competitive companies involved in global value chains. CzechInvest, an agency of the Czech Ministry of Industry and Trade, is the key organisation in these efforts. Current good performance of the Czech economy has been influenced to a large extent by the inflow of foreign direct investment (FDI) since the second half of 1990s. Apart from the increase in productivity, a greater export orientation and the creation of new jobs, FDI has contributed to the modernisation and higher competitiveness of the national economy.

Future prosperity of the Czech Republic will increasingly depend on the growth of economic activities based on knowledge and skills. Competitive strength in labour intensive industries has already started to decrease, and this decline is being compensated for by the growth of economic activities of higher value added. There is an increasing strategic imperative to nurture and support local business conditions and regional operating environments which are capable of developing and stimulating development of new knowledge intensive businesses. Moreover there are market imperfections and in certain cases endemic market failures, in particular in less favoured regions, which fundamentally constrain both the development of business support environments and the types of businesses that are needed to drive cluster growth and development.17

The endemic failures are evidenced in the failure of less favoured regions to quickly develop well formed and fully functioning local innovation systems. This is typically reflected in any detailed analysis of the required range of specialised complementary assets where substantial gaps often exist which investors from the private sector alone are unwilling or unable to fund. Such opportunities are ready made for intervention by the public sector where a strategic partnership approach is the obvious and preferred means of addressing the failure. Beyond endemic market failures regional economic development is often constrained by information and co-ordination imperfections. The ignorance about benefits associated with collaboration, and a

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general resistance of firms to co-operate and integrate is one type of such information imperfection.

This is reflected in regional weaknesses in entrepreneurship development and low degrees of intrapreneurship, understood as ability to innovate, in existing firms, which is mainly relevant for young and embryonic co-operative arrangements and clusters, which is the case for almost all such arrangements in the Czech Republic, and, in particular, when these are located in structurally disadvantaged regions. Another co-ordination failure is related to insufficient integration and alignment of industrial structures in disadvantaged regions with the existing European high value added networks and specialised resources, such as venture capitalist networks.

The Czech Republic has therefore decided to go beyond the bottom-up concentration of economic activity identification approach and although regions have identified their industrial priorities in the past (there was a Cluster programme financed from the first Operational programme Industry and Enterprise after accession) a comprehensive study was conducted using the modified Porter method of relative national (and regional) global competitive advantage identification approach in all NUTS 3 regions of the Czech Republic and at national level.

Analysis of current and past export performance by items at 5-digit level of Standard Industrial Trade Classification (SITC) codes was conducted at national level and a long-list of items where the Czech Republic’s share of world’s exports was higher than 2.6% (more than three times higher than the export power of the Czech Republic in the world) of total world exports was compiled. Items with stagnant or decreasing shares were removed, as well as items for which global trade did not grow as fast as the total volume of world exports developed. Items where the high export activity was derived from proximity benefits were removed, but items that were related to automotive and electronics industries, where Czech Republic has highest inward investment activity track record were added back. The results of the analysis were decomposed also to the level of regions using local data. To the knowledge of the author such detailed analysis of proven competitive advantage has not yet been conducted anywhere else in Europe.

Why the approach is relevant to Halle/to East Germany?

This example provides information about experiences made with a method to identify regional core competences and areas where location specialisation can be further pursued. East Germany and the region around Halle is characterised by a more advanced market system than the Czech Republic and the experience with support to innovations in this region is longer and more intense. However, the competition in creating the best local support environments in Europe becomes more intensive with new member states struggling to restructure and revive their economies. The Czech Republic in many ways follows models from Scotland and Ireland. It still benefits from different cost levels associated to production factors compared to Germany and even East Germany. This is changing though and Czech institutions responsible for economic development, such as CzechInvest, respond to these trends by adopting new methods in working with the business community. The Czech Cluster study is unique in its ability to relate output of regional economies to their success in international markets, which is a perspective that is often neglected by economic analysts who tend to focus on identification of territorial concentrations of input measures such as industry specific employment. In this respect, the approach taken in the Czech Republic can provide interesting insights for Halle, for Saxony-Anhalt and for East Germany.
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Reasons for the success of the approach

The cluster study helped regions in the Czech Republic to gather and process statistical data, which in turn build a basis for confirmation or correction of strategic orientation on industries, value chains and companies. The data available allow for a selective and highly specialised approach in fostering and supporting productive and collaborative alliances, such as clusters, poles of excellence, and technology platforms. As a result, public support is not necessarily concentrated on branches of industry that are "in fashion", but it rather encourages the identification of and a concentration on product domains and technologies, where the relative competitive advantage, and therefore chances for success are the highest. The results and long-term impacts are expected to positively reflect on the competitiveness of regions, resulting in an increased net job creation, value added, greater export intensity, and higher per capita income.

The obstacles that were faced and the quality of the response taken

In Central and Eastern Europe it seems to be difficult for regional or local authorities to accept that the economies of their constituency territories are undergoing major structural changes, which are often accelerated by trends and events outside their influence. The National Cluster Study identified industries and value chains which were at first sight not considered the ones having the highest potential. The major obstacle for the conduction of the National Cluster Study was the conflict between the "bottom-up approach" of cluster identification that was often motivated by existing industry specific resources (push approach) and the "top-down method" that considered output measured by success in international markets (pull approach). None of the approaches proved to be more appropriate than the other, which finally led to a combination of both approaches. This in turn facilitated at a later stage the regional consensus building process. The latter has been started with the aim to adopt new strategies for the identification of regional industry priorities. This work is still on-going and much more needs to be done in terms of interviews with representatives from the local business sectors and university communities, which will support the process of mapping details related to the regions' strategic value chains.

Considerations for adoption of this type of approach in Halle and in East Germany

Trade share analysis based cluster identification can not be considered a one-size-fits-all recipe that is missing in Halle. On the other hand, the strengths and weaknesses section of this report identified a need for a more strategically focused global market orientation of local innovative start-ups. The current cluster and industry specialisation framework at the Land level does not seem specific enough for Halle. The University community in Halle and other relevant stakeholders could design a system that would allow for a measurement of the economic performance of local innovative firms and their international success. This in turn would provide valuable information for public policy to selectively allocate scarce public resources for innovation support, such as space and services provision.
Contact details and website for further information

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INNOVATION SUPPORT AND PUBLIC AND PRIVATE NETWORKING

By Andrea R. Hofer, OECD

Introduction

Current policy models in the field of innovation have a strong emphasis on developing knowledge-based and high-tech industries. Recent OECD work reviewing national innovation systems stresses the importance of increased networking and collaboration amongst public agencies in this respect. For example a recent report has called for greater attention to institutional adaptation in the area of science, technology and innovation and the "need to develop innovation policy components across ministerial boundaries". This co-ordination needs to involve the local level in identifying the precise policy mix required for local needs and in pulling together appropriate activities from different national, regional and local levels of government. Promoting innovation also requires networking amongst firms and research organisations. This chapter discusses both issues.

Translating this into entrepreneurship and small firm development strategies at the local level, the challenges confronted are related to the building and strengthening of local and or regional research excellence and technology transfer both from laboratory to industry and from company to company. For an effective and efficient local delivery of public policies and strategies aimed at fostering the growth of knowledge-based and high-tech industries, and strengthening the participation of SMEs, public agencies should seek to establish a local innovation support system to cover different stages of support including the provision of general information, access to technological advice, and the planning and implementation of joint R&D projects bringing together firms, industry organisations, higher education institutes (HEIs) and other public research organisations. The quantity and quality of organisations involved and the leadership roles assigned varies between different models developed in OECD countries, and ideally should reflect local needs.

Networking can be a significant factor contributing to growth of small firms. It is particularly relevant for those companies who base their activities on high-technology. For them, networking is a means of making up for risks and uncertainties in the development and exploitation of new products and processes. Creating, exploiting and managing network relations is important to achieving economies of scale and rationalisation of costs and time as well as accessing new knowledge, in particular related to access to resources and markets, exchange of technology and know-how, and exchange of information regarding technology development processes.

This chapter examines how Halle may strengthen its local innovation system in order to facilitate and promote global and local connections, which in turn allow local firms to make full

use of business and market opportunities. The chapter starts by providing a review of the strengths and weaknesses of current arrangements in Halle, including the good practice developed at Land and local levels. Recommendations following the strengths and weaknesses are then set out and illustrated with an international learning model, intended to inspire policy innovation by providing ideas for the improvement of the local innovation support system.

**Strengths and Weaknesses**

Integration and co-ordination across different government levels seem to characterise design and implementation of innovation policy. At Saxony-Anhalt Land level, integrated and linked policies and programmes help to align objective and target setting, and contribute to a reduction of duplication and trade-offs. Apparently there is close co-operation between Land and local level innovation support systems. Communication channels seem to function well, with line Land ministries being involved in existing local networks. These channels offer public policy a valuable source of feedback on the outcome of co-ordinated and integrated policies and programmes. These arrangements appear to support policy implementation at local level, as integrated policies reduced the number of interlocutors, helped to alleviate unnecessary overlaps in regulations and eligibility criteria, and ensure timely communication on chances in public support programmes. The close co-operation between local and Land levels also facilitates interregional co-operation with other Länder. In a federal system, economic geography is not necessarily congruent with administrative borders. This is of crucial importance for innovation support and technology transfer with the intention of wider economic development.

A particular emphasis is placed on the involvement of HEI. Two viable networks of higher education institutes with linkages to business support services and the private sector have been established with public support: the IMPULS network covering the northern part of Saxony-Anhalt; and the UNIVATIONS network covering the southern Land parts.

There is significant networking activity among public and private economic development organisations in Halle with regard to small firm development strategies. It is important to enhance a general understanding that entrepreneurship is a viable alternative to paid employment. Leadership of the local innovation support system is with the City of Halle and the Chamber of Commerce and Trade. A wide range of organisations, including public finance institutions, the public employment service, higher education institutes (HEIs), public research organisations, and business associations are collaborating on provision of general information to interested firms and individuals, firm access to technological advice, and the planning and implementation of joint R&D projects. The University community in Halle has taken a strong and effective leadership in stimulating HEI entrepreneurship, and successfully engages other stakeholders as mentors to students and academic staff and providers of capital and other resources for University-based start-ups. In Halle, the efforts initiated by the University seem to be fully embedded in the partnership work with business support institutions at both local and Land levels. A joint coalition of the Chambers and the local labour office seems to be effective in addressing issues of skills up-grading and development of the local labour force. The existence of individualised training schemes and a close co-operation between training providers and local companies can be considered good practice. Also, public and private sectors in Halle work closely together in addressing image problems and raising the attractiveness of the city and its surroundings as a business location.

Although public support shows a strong focus on university entrepreneurship, there seem to be no bias in public policy and local support measures towards university entrepreneurship and spin-offs. Nevertheless attention is needed that strengthening the University's role as an
Innovation support and Public and Private Networking

important actor in the local innovation support system does not lead to a segregation of non-university entrepreneurship. The initiative *Wissenstransferverbund*, a database for matching research projects and potential users, also offers companies the opportunity to look for students and graduates as interns and trainees. This initiative can be mentioned here as a step towards strengthening the university-local company interface. The programme *Innovationsassistent*, funded by the Development Bank of Saxony-Anhalt, complements this: it provides an incentive for companies to hire university graduates, albeit the offered remuneration supplement being time restricted for up to two years.

Firm clusters in Halle are supported by the public sector. Business support organisations, led by the Chamber of Commerce and Trade and the economic development department of the City of Halle, have created a supportive framework for technology collaboration among firms and research organisations, also across Land borders, incorporating public spaces for science and innovation activities, such as the Weinberg Campus and the *CellTech BioReaktor* discussed below. The Chamber of Commerce and Trade functions as general co-ordination point for companies. It has a specialised structure for serving firms who base their activities on high-technology. For these companies, networking is a means of making up for uncertainties deriving from the application of high-technology in burgeoning markets; it also helps firms to understand uncertainties as potential business opportunities. High-tech firms are interdependent upon technology development in other firms. The information available for this report, however, does not reveal to which extent the Halle business community, outside the technology and innovation centres, is organised in firm clusters and benefits from networking activities.

The *Innovations - und Gründernetzwerk UNIVATIONS* represents an extraordinary and commendable co-operation amongst four HEIs with significant connections to financial institutions, venture capitalists and political actors at local, Land and national levels. This organisation provides a model of success that could be emulated by other clusters of universities throughout the world. The stimulation and identification of business ideas from within HEIs has been a major objective of UNIVATIONS so far. Activities to bring together those with a business idea and those who can catalyse and develop it into businesses are regularly organised. UNIVATIONS plays an important role in identifying and inviting most appropriate participants. These events are also used to bring interested university students, graduates and academic staff in contact with successful start-ups. Teambuilding amongst students and preferably the participation of academic staff is fostered. However, participation in such activities by outsiders appears to be limited. More could be done to stimulate technology transfer from University to companies and from University spin-offs to other companies.

UNIVATIONS aims with its networking activities to follow two directions. Firstly, it links HEIs in the region and connects them with other networks in Germany, including recently started international outreach. The spirit of co-operation amongst the four partnering HEIs is exemplified by the fact that each university refers student entrepreneurs to the most appropriate resources for their needs, even when those resources are at one of the other institutions. This allows participating universities to develop both individual and collaborative strengths and helps to establish and to spread local linkages between spin-off firms and local companies. Each university is thus also in a position to foster local inter-firm exchanges. With this second type of networking, UNIVATIONS seeks to link HEIs with local firms and start-ups. Extending the target group, from the initial core group of university students, graduates and academic staff, to local business clusters, financing institutions and venture capitalists, as recently launched with the *Innovationswerkstatt* project, can be seen as a promising approach to make full use of the

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19 For further information, see http://univations.de.
network's potential to contribute to a wider economic development in Halle. The aim of the new innovation workshop is to become the main interface between key local industries and the local science base in facilitating technology transfer from laboratory to industry and from company to company. The approach is meant to assist in the channelling of public support and private funding into business ideas with high growth potential and small firms with growth intentions, and further, to foster networking between these firms. Whereas Innovationswerkstatt can build on UNIVATIONS position in the local innovation support system and its previous achievements in fostering university entrepreneurship, further interaction with local companies will be needed to engage them, and in a second step to enhance technology and know-how spill-over into the local SME community. First results need to be awaited before assessing whether the University of Halle has a comparative advantage over any other actor in the local innovation support system in running such an interface. The often claimed limitations in networking activities at inter-firm level in Germany, would support the assignment of a co-ordination role to UNIVATIONS, which is to offer interested companies general information, access to technological advice, and assistance in the planning and implementation of joint R&D projects.

Good practice in Halle

There are several good practice initiatives concerning networking and innovation support in Halle. The examples outlined here highlight on-going local efforts to stimulate technology transfer with the objective of enhancing the University's contribution to the wider economic development of the region.

The Weinberg Campus network – an international meeting point for science and industry

The Weinberg Campus network can be mentioned as a good example of bringing together University, research institutes, hospitals, SMEs, and business support and financial institutions under the joint objective of making Halle an international reference point for potential growth industries. It is important to continue fostering the role of the University of Halle as a promoter of various forms of technology and know-how transfer from inside a HEI to the outside business community, in order to avoid the segregation of non-university entrepreneurship. Spin-offs and other companies located on the Weinberg Campus use research assets to create new commercial activities with the potential of generating an economic impact that goes beyond the university and research scene. These companies help to develop external relations, including the attraction of researchers and companies. In addition, such a successful context can attract venture capital and the interest of business angels from both within and outside the region, which in turn can help to overcome barriers between local SMEs and venture capitalists. Places like the Weinberg Campus can also contribute to a change in central government's perceptions of the quality of a place.

CellTech BioReaktor – an interregional network of SMEs and research institutions

CellTech BioReaktor is a regional network that has been founded in 2005 by seven, mostly local, SMEs and seven research institutions, of which all, except one, are placed in Halle and its surrounding region. The network is co-ordinated by the Technologie- und Gründerzentrum Halle GmbH (TGZ) and receives funding from Netzwerkmanagement Ost, a federal programme that provides financial support for these kinds of networks in East Germany. CellTech BioReaktor has been successful in admitting as a full partner a network from Saxony, the Dresden based Net

20 For further information, see http://www.weinbergcampus.de.

21 For further information, see www.celltech-bioreaktor.de.
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Bus. This has been made possible by the strong support for CellTech BioReaktor from the Ministry of Economy of the Land Saxony-Anhalt. Given often existing difficulties in setting up joint projects across different Land borders, this can be seen as an achievement.

The examples Weinberg Campus and CellTech BioReaktor can be considered good practice in making economic returns on university and knowledge based entrepreneurship available to a wider group of firms. In order to generate localised effects, it is important to intensify efforts so as to further embed companies in the locality, thus aiming to retain knowledge-intensive and high-value activities in the region, despite potentially good reasons for settlement and expansion elsewhere.

Recommendations

Avoid segregation of non-university entrepreneurship support. Under the premise of tailoring policy and programmes to the local and regional context, full use should be made of the existing communication channels between different government levels, so that objective and target setting processes in entrepreneurship and innovation policy could reflect the whole variety of local contexts and local needs. More formalised involvement of line Land ministries in existing local networks, would offer opportunities to further develop and tailor local approaches to further stimulate the participation of local SMEs in knowledge-based and high-tech industries.

Enhance co-operation between the HEIs and the local business community. In general, local co-operation in innovation activities and R&D based networks among firms is limited. Partly this can be seen as due to the egoistic behaviour of firms. Networking, however, can be facilitated by the existence of a co-ordinating organisation, which is considered by local companies as being impartial or at least enabling knowledge and know-how spill-overs. The position attained by the University community in the local innovation support system is complemented by technology and innovation centres and incubator facilities that enable the use university research facilities by local companies. However, universities are not usual interlocutors for local firms. Even high-technology and growth companies direct, in first place, a request for support or interaction to the Chambers. A closer co-operation, perhaps even on a formalised level, between the HEIs and the Chambers could therefore be useful to reducing the distance and barriers between the University and local enterprises. This could stimulate a more positive public attitude towards technological development and innovative SMEs. In addition, a further intensification of communication and interaction between the university and the local business community could help to extend current technology transfer activities by adding contract research activities and consultancy by the University. It would fruitfully integrate technology transfer with wider entrepreneurship education at university.

Concentrate efforts and create a one-stop shop for science-industry linkages. The establishment of a one-stop shop for spin-offs and companies interested in technology transfer should be further discussed. Such an entity could help to increase efficiency and effectiveness of public support programmes, provide potential beneficiaries with information on existing programmes to increase science-industry linkages, and contribute to a further tailoring of policy interventions to local needs and streamline procedures. Experience from other OECD countries demonstrates positive results from one-stop shops that are run as a public-private partnership. Public and private objectives are negotiated to find a compromise that allows for public-private sharing of risks and costs. Expected results include: a better exploitation of complementarities between public and private R&D; the identification and filling of gaps in infrastructure; and the overall increased leverage of public support. It is important that the one-stop shop is familiar with the R&D activities and specialisations of SMEs in Halle and its surrounding region and that
the agency can build on long-standing formal and informal relationships, with both other actors in innovation support and the local business community. To be effective, such an agency should stimulate the innovation and technology aspirations of companies: it should be in a position to proactively respond to existing needs, rather than simply dealing with specific company requests. UNIVATIONS, given its current central role in existing networks and the general support received by local and Land level actors, seems to have the capacity to become an interlocutor for local companies, if they remain open to both the need of HEI and non-HEI entrepreneurs.

Innovation support and Public and Private Networking

Increase the outreach orientation of UNIVATIONS. An increased outreach or marketing orientation of UNIVATIONS would increase the attractiveness of the local science industry environment for scientists and companies from abroad with intentions to internationalise their activities. A strategy to increase contacts, with and exchanges between University Alumni should be built. Besides the access to regular information in the form of newsletters and mailing lists, the organisation of regular meetings on specific themes may help to maintain contact. The involvement in the work of UNIVATIONS of those Alumni that have become successful entrepreneurs could be a valuable contribution to entrepreneurship programmes in the university network. UNIVATIONS has the capacity to develop the University of Halle into a place that anchors a network, which is locally/regionally embedded, with global constituents, and thus enables for a participation in the global resource flow around high-technology, something which can lead to local economic benefit.

International learning model

Centre for Innovation and Entrepreneurship (CIE), University of Linköping, Sweden

Description of the approach

The Centre for Innovation and Entrepreneurship (CIE) is based at the University of Linköping in Sweden. It conducts activities intended to stimulate the growth and development of technology-based firms. These activities are planned and conducted in close co-operation with SMIL, a local business association whose membership is composed of small technology-based firms in the Linköping area.

The main purpose of CIE is to create a fruitful integration between stimulation activities for technology-based firms, and the teaching and research of technology-based entrepreneurship within the university. The co-operation between CIE and SMIL reflects the recognition of the need for stimulating both creation and growth of knowledge-intensive type of firms as an essential factor to foster an effective and mutually benefiting connection between universities and industry. The main activities developed by CIE/SMIL may be divided into (a) the promotion of new businesses establishment (b) the updating of business expertise of already established firms and (c) the promotion of social networking activities and exchange of information between firms belonging to SMIL. Each of these activities are briefly described below:

The entrepreneurship and new business development programme: The main aim of this programme is to solve the problems that can be encountered in establishing and managing a new firm. It aims to recruit those individuals who have both a plausible business concept and an interest in starting and running a business. The primary target groups for the programme have

Learning model prepared by Dylan Jones-Evans, professor and director of National Entrepreneurship Observatory for Wales, UK.
been students, researchers at the University, and people in established business firms. The main structure of the programme involves a number of workshops where the central themes of entrepreneurship and small business management are discussed. In parallel with the workshops, the participants develop business plans for the establishment of the new venture, and certain financial resources are made available to cover the costs of, for example, meeting customers and market surveys. An important part of the programme is the process of mentoring for these fledgling entrepreneurs, which is carried out by one of SMIL’s existing network of experienced businessmen. In addition, SMIL has secured co-operation with the local science park, which makes premises available for the new firms. At any one time, between 10 and 15 people will participate in the programme, which lasts one year, and experience has shown that slightly more than half of these participants will subsequently establish a new business. To date, since its inception, a total of 10 firms have been established as a direct result of this programme.

The development programmes and the management groups: For the more established firms, various development programmes and management groups are available. Here, the basic idea is to update the business expertise in the firm by working out solutions to certain known specific problems in their activities. Common problems can include internationalisation, market positioning, professional board management, and quality assurance systems. It is important to point out that these are a series of ‘keep-fit’ measures for companies, and are not aimed at firms which are in acute management crises. During the programme, which covers eight to ten days spread over a year, a group of six to nine firms participate where each one is represented by a maximum of three people from the firm's managerial team. Specific problems are solved in smaller sub-groups composed of three to four firms. It is usual that group work is alternated with a series of lectures for the entire group, where problems that concern all the firms are discussed. Whilst the development programmes will be more general in nature (with different firms discussing a variety of company-related problems together), the management groups are more focused, and concentrate on the solution of just one specific problem common to all the participating firms. Another important difference is that the development programme is targeted towards firms in at an earlier phase of development than those which will partake in management groups. This concept is based on the fact that it is more suitable to first solve a firm’s management problems on a more general level prior to concentrating on more specific problems. It is therefore an advantage if the participants in the management group have already taken part in one of the development groups. To date, approximately 100 firms have taken part in the development and management group programme, with about 200 people participating.

The club and networking activities: The third function of CIE is the co-ordination of the club and networking activities whose main aim is to create a social network and exchange of information between a network of high technology firms in the region, many of whom have been on the programme. Each month, activities such as pub-nights and various forms of seminars, where junior businessmen can meet senior businessmen and exchange experiences, are arranged. Each activity attracts between 15 to 30 firms. Other forms of network building can be found in the booklet “Ideas That Really Mean Business”, where information such as firm addresses, lines of business, products, and markets are listed. The catalogue is distributed both in Sweden and internationally, and is a good marketing device for small hi-technology firms.

All these activities have a main emphasis on examining the different problems which occur at different times during a firm’s development. With tailored activities, firms gain access to resources relevant to their particular stage of development. The success of these activities is as dependent on the contribution of the SMIL firms themselves to the group, as it is on the efforts of CIE in leading the activities.
Each of the activities has a co-ordinator who, together with resource persons (both academics and entrepreneurs) engaged for the project, is responsible for the implementation of the activity. In addition, the success attained by the CIE-SMIL initiative, particularly in what concerns spin-off based firm birth and development and networking promotion, can be regarded as strongly connected with the innovation supportive environment existing in Linköping region. The favourable environment stems, on the one hand, from the existence of a number of high-technology large firms and, on the other hand, from the synergies which have been developed within local University between business stimulation, R&D and educational activities.

The yearly budget for carrying out the activities approximately 300,000 euros per year. Other income can be generated by charging for participation in an activity. Participation in one of the larger programs costs approximately 2500 to 3000 euros per firm, although this can be subsidised by public grants which have supplied resources for the activities. In this way, the attendance fees for firms have been kept low.

Why the approach is relevant Halle/to East Germany?

The importance to Halle and East Germany lies in an organisational initiative which has created a synergy, within the university, between the various business stimulation activities, research work and teaching which can have considerable benefits for both academic and business involvement in the technology transfer process.

The CIE-SMIL model ensures the continued development of a strong relationship between university and industry including a commitment in catalysing innovative activities, pooling resources and sharing different technical and business experiences.

The CIE-SMIL case-study demonstrates that stimulation activities between university and industry need not be financially prohibitive and can, indeed, be carried out with relatively limited means in terms of organisational and financial resources.

Reasons for the success of the approach

There are five key reasons as to why this model has worked.

(a) The ability to meet real needs. The activities were grounded in the firms’ experienced need of various kinds of stimulation. Through the activities, it was then possible to identify and put into concrete form the firms’ real needs in order to then offer tailored solutions. As a result, the firms have been able to take appropriate measures such as the development of a more consistent business idea, the effective utilisation of market and business plans, the instigation of reward systems for employees, and finding partners in different areas such as financing and product development marketing.

(b) The core group. A management board of competent and committed people with different roles was available. The members of the board all have an understanding of small business, possess structural knowledge, and have access to an enthusiastic leader who can promote the activities of the group.

(c) A clear focus. Since the start, CIE-SMIL has focused on the development of the management of small, technology-based firms concentrating, in particular, on the executive group within the venture. Activities based on this principle have then been developed and carried out, which have resulted in an ability, by the management of these firms, to communicate effectively their plans for development to other actors, such as potential financiers.
(d) **Credibility.** The development of SMIL is characterised by a strong commitment by the majority of the firms. The trust they have in SMIL has depended on a well-functioning network with strong social dimensions. Participation in the stimulation activities has meant that firms, in many cases, must release information of a sensitive nature under an oath of silence. To date, nothing has leaked outside of the group.

(e) **Close relations between SMIL and the University.** Both institutions have complemented each other well through co-operation. SMIL can be thought of as being the eyes and ears of the market-place where the firms’ need for stimulation has been recognised, whilst CIE, as the university partner, has contributed a secretariat and financial resources, structural knowledge and credibility.

**The obstacles that were faced and the quality of the response taken**

Financing for projects has always been a question of seeking funds after a need has been defined and an idea for an activity formulated. One important part of funding has also been the sensitivity to the wishes of the Government authorities concerning stimulation.

When public funds have been made available, the strategy has been to quickly formulate proposals, apply for funding and, if granted, convert the funds into activities tailored to specific needs. Indeed, since its inception, the availability of financial resources from Government authorities to CIE has been satisfactory.

**Considerations for adoption of this type of approach Halle and in East Germany**

The work of CIE, especially in encouraging the development of new technology-based firms, has been adopted in a number of regions throughout Europe.

This model, which ensures that a dedicated centre is developed for the promotion of technology-based entrepreneurship, and works closely with technology-based firms within the region, should be of interest to universities within Eastern Germany who wish to develop closer links with their local business community.

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Conclusion

CONCLUSION

This Discussion Paper seeks to provide an external perspective on opportunities for the development of entrepreneurship policies that aim at maximising the contribution of the higher education sector to local development in the Halle and its surrounding region. It makes observations on the strengths and weaknesses of the current regional and local entrepreneurship environment and policy framework, recommendations on how policy could further promote entrepreneurship, and provides examples of programmes in other countries that illustrate the sorts of approaches that could be taken to implement the recommendations.

There is a strong potential to develop innovative entrepreneurship around the core science and technology strengths of Martin Luther University Halle-Wittenberg and other higher education institutes (HEIs) in Halle region. The HEI community in Halle has taken a strong and effective leadership in stimulating HEI entrepreneurship, and successfully engages other stakeholders in providing innovation infrastructure, human and financial capital, and other resources for University-based start-ups. The efforts initiated by the University seem to be fully embedded in the partnership work with business support institutions at both local and Land levels, which allow for knowledge and technology spill-overs to non-HEI entrepreneurs. The existing network structures provide the ground for public policy and local entrepreneurship support programmes to further promote interaction between the research community and the local economy. Although it might be possible to have vibrant entrepreneurial activities within the HEIs, technology and knowledge transfer into the local SME community require receptive environments on both sides. These prepare for communication and interaction between these two communities, which often develop quite independently.

Whilst there are several short and medium term approaches to strengthen the contribution of the existing science and technology base to local entrepreneurship, a large part of the policy effort should focus on achieving a number of longer term shifts. These include changing the attitudes towards and motivations for entrepreneurship, as well as strengthening abilities to undertake entrepreneurship activities, reducing distance and barriers between the University and local enterprises, attracting academics from the rest of Germany and the rest of the world, strengthening local, regional and global university-industry linkages around Halle’s research specialisation, and further tailoring policies and programmes to business needs. It is also important to recognise the scale of public funding in maintaining the current innovation and enterprise support. The existing policy initiatives themselves are impressive, but they might not be sustainable without continued public funding. The already started gradual reduction of public kick-off funding and the inclusion of the business community in support measures can be mentioned here as examples of good practice policy.

Four main areas of intervention are suggested for extending and improving public support, with the aim of further minimising dependency upon public funding:

- Strengthen entrepreneurial attitudes and motivations within the University and the local business community and develop skills for successful entrepreneurship and growth businesses.
• Increase the outreach orientation and networking activities of the University entrepreneurship support.

• Minimise dependency upon public funding and involve the private sector in devising innovation support and infrastructure.

• Develop tailored programmes that help firms and self-employed to assess their innovation and growth potentials, and strengthen the local policy design and delivery framework.

These key issues are discussed in turn below.

**Enhance entrepreneurial attitudes and motivations for successful entrepreneurship, innovation and business growth**

Rapidly growing firms can make significant direct contributions to employment levels. Before other pro-growth factors, such as growth potential products, assets and premises, market conditions, access to finance, public sector regulations and skilled labour, can be of noteworthy influence, the right attitudes and motivations for successful entrepreneurship and firm growth need to be in place. Policy efforts to this end need to address HEIs as well as the local business community.

HEIs in Halle and its surrounding region should continue their current efforts in promoting entrepreneurship and knowledge and technology transfer activities; the work of UNIVATIONS represents a model that other institutions should learn from. In order to progress further, an entrepreneurial mindset and skillset among professors, academic and administrative staff should be proactively developed. Also the reliance on extra-curricular workshops and networking events could mean not to capitalise the full potentials of university entrepreneurship. The goal should be to promote attitudes and motivation for entrepreneurship beyond self-employment and fostering a culture of high risk and aspirations for high potential entrepreneurship as part of the University's mission. In order to improve the long term sustainability of the programmes, procedures should be designed and implemented to better monitor the economic and social impacts of educational and extracurricular entrepreneurship programmes. Quantitative measures of results would facilitate potential sponsorship for programmes and would help to replicate successful programmes elsewhere.

For many SME owners business growth and innovation are not immediate objectives. A shift towards more 'entrepreneurial' attitudes and motivations to expand and innovate current activities will need to take into account demographic variables, personal characteristics, values and beliefs. For all sizes of firms the presence of a university can be a stimulus for growth intentions, and a source of innovation. Universities and research institutes are not the usual interlocutors of firms. Even high-technology and growth companies direct, in first place, a request for support or interaction to the Chambers and business associations. Within the existing innovation infrastructure an increased co-operation between the HEIs, research institutes and the Chambers is therefore needed to reduce distance and barriers and to facilitate the exploitation of knowledge and technology through a wider group of firms, both within and outside Halle region.

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24 Ibidem.
Key activities recommended for promoting attitudes and motivations for successful entrepreneurship, innovation and business growth include continuing and expanding activities that foster entrepreneurial attitudes and motivations for business development and growth among potential HEI and non-HEI entrepreneurs as well as within existing SMEs, minimise barriers to and provide incentives for professors to start businesses, and enhance the co-operation between usual business interlocutory organisations and HEIs.

Examples of programmes in these areas developed in other OECD countries include:

- Linking entrepreneurship to the mission of a university and developing activities that help to boost the level of graduate entrepreneurship (as "Enterprise Champions" in Wales, UK).

- Creating a fruitful integration between stimulation activities for technology-based firms, and the teaching and research of technology-based entrepreneurship within university (as the "Centre for Innovation and Entrepreneurship", University of Linköping, Sweden).

Increase the outreach orientation and wider networking activities of University entrepreneurship support

Just as internationalisation and wider networking is vital for fast-growing small businesses, so it is for a research-based university. Creating, exploiting and managing wider network relations is important to achieve economies of scale as well as accessing and exchanging information about new knowledge, resources and markets. Cultural barriers between local SMEs and the HEIs and research communities often lead to a lack of social networks that are prerequisites for building more formal partnerships. OECD research shows that only interpersonal relationships will bridge the two worlds when they are profoundly separated. UNIVATIONS could act as this bridge. Its involvement in the local innovation system should be strengthened further in order to pull ideas from the business community in Halle and also elsewhere to jointly develop and test technology. The same applies for the co-operation with multinational companies, which can help to accelerate and scale-up commercialisation processes because of their strong access to global markets.

Active involvement in international networks would help UNIVATIONS to contribute to the internationalisation of the local economy and would attract scientists and companies. Towards reaching its objectives of promoting university entrepreneurship, a greater outreach would help to gather and disseminate information about the advantages of internationalisation, such as access to know-how and technology, ways to overcome high production costs on the domestic market, access to new and larger markets for products and services, additional production capacity, access to capital and labour. To this end also a strategy to increase contacts, with and exchanges between University alumni should be built. The involvement in the work of UNIVATIONS of those alumni that have become successful entrepreneurs could be a valuable contribution to entrepreneurship programmes.

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Key activities recommended for an increased outreach orientation and wider networking activities of the University include regular meetings and exchange platforms between HEIs and research institutes and the local business community, include outsiders in the target group of university entrepreneurship activities, increased (international) outreach orientation of UNIVATIONS, and a strategy to increase contacts with and exchange between university alumni.

Examples of programmes in these areas developed in other OECD countries include:

- Enable universities to apply its wealth of knowledge and expertise to strategic business problems by introducing suitably qualified graduates in local companies with the aim of improving turnover and gaining market share, intellectual property and a competitive edge (as "Knowlegde Transfer Partnerships", UK).

- Enriching and expanding the pool of knowledge and financial resources of university innovation support by developing strong relations with alumni (as the "Rochester Institute of Technology", US).

**Minimise the dependency of innovation support upon public funding**

The current extent and utilisation of public funding would need to be reviewed in terms of its transition to self-sufficiency away from kick-start activities. All stakeholders of business and innovation support should be involved in devising a strategy for developing a more commercial approach to their work. The aim should be to increase the commercialisation of financing by looking for returns on real estate, private investment in funds, overhead fees paid by investors, incentives to managers to seek returns. Ways should be found to increase private involvement in infrastructure development. An early consultation with private high-tech facility developers and operators would help in designing spaces that would attract private investment by communicating the typically involved technical, legal, political and economic risks and negative returns in early years. For future viability of these facilities, the real estate component of innovation support should be considered an asset capable of producing commercial return, against which also further public and private investment could be secured. Efforts should be made to endow UNIVATIONS and to ensure its long-term sustainability. Options to this end include equity stake taking in each assisted company, and increased financial sponsorships from local businesses.

The public incentives for the establishment of the business angel network in Saxony-Anhalt helped to start this important instrument. OECD work confirms that angel finance or informal equity is a major source of equity in financing innovative and growth oriented SMEs. One of the highest numbers of business angel networks among OECD countries can be found in the UK where the experiences indicate that the public sector support is cost effective compared to other public support schemes. On the long run angel networks should receive public support only to maintain operation and incentives should be developed to increase commercial sponsorship from firms engaged in the investment process. Often potential angels are reluctant to get involved partly due to a lack of knowledge about what is entailed and a lack of relationships with existing angel investors. Here the attraction of 'knowledge' angels that pass on relevant processional and business experience to investee companies, without necessarily investing themselves, can help to overcome information asymmetries.

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Key activities recommended for a reduction of public funding include devising a strategy to increase commercialisation of public funding, introduce private finance into real estate operations, increase the number of business angels, and continue financing the overhead cost of the business angel network while seeking for increased commercial sponsorship.

Examples of programmes in these areas developed in other OECD countries include:

- Making use of necessities and understand innovation as a social process that relies on interaction, serendipity, trust, and the exchange of tacit knowledge (as "CONNECT", San Diego, US).

- Launching businesses to commercialise university owned intellectual property (as the "Technology Venturing Programme", University of Chicago, USA).

- Increasing the pool of knowledge and business angel investors by recruiting high net worth individuals with relevant business experience and an interest in helping to build, support, mentor and invest in early stage companies with growth potential (as the "Business Angel Development/Ready2Invest Programme in London, UK.

Tailor innovation support to the needs of high growth business ideas and growth firms

Tailored innovation support requires mechanisms that allow for an identification of needs and aspirations of growth oriented firms. Full use should be made of existing communication channels between different government levels and among different local actors, so that objective and target setting processes in entrepreneurship and innovation policy and programmes reflect the whole variety of local contexts and local needs. This requires a strengthening of the local policy design and delivery framework and concerns both the science and the industry base of a local economy.

Existing efforts at local level should be further concentrated and the establishment of a one-stop shop for science-industry linkages should be discussed as a means to increase efficiency and effectiveness in public support programmes, to streamline procedures, and to provide expert information. Such an agency would ideally be in a position to proactively respond to existing needs, rather than simply dealing with specific company requests. Experiences in OECD countries demonstrate positive results from one-stop shops that are run in public-private partnership as they facilitate sharing of risks and costs. UNIVATIONS, given its current central role in existing networks, seems to have the capacity to become an interlocutor for local companies, if they remain open to both the need of HEI and non-HEI entrepreneurs.

HEIs in Halle should recognise the value of intellectual property created as a result of their research. Capitalising on underexploited means of commercialisation will require a maximal reduction of barriers to professors in starting businesses and universities should, in the long run, provide incentives for professors to start businesses. This includes ways to audit the intellectual property (IP) capacity, also with regard to potential technology and knowledge transfer. For SMEs (including university spin-offs) the protection and management of IP is far more difficult than for larger firms. They tend to have less specialist personnel and thus need to deal with a wide range of business relevant issues at the same time. In order to provide assistance tailored to the need of businesses in different development stages, existing networks could be used or expanded to identify and procure missing or underrepresented components of the local innovation system. Technology and knowledge intensive business activities need longer to develop from a business idea into flourishing and expanding enterprises, which suggests for
Conclusion
tailored public support measures to manage growth during the post-incubation period. Current
support activities for firms in the post-incubation period should be therefore continued and
intensified.

Tailoring innovation support efforts could follow criteria that link with Halle-specific
global competitive advantages, such as the business' potential for value added, matching with
strategic clusters, coherence with strategic core competences of the region, export orientation,
and global market potential. The adoption of a more strategic approach in project selection might
be required. A well functioning network of business support organisations and industry experts
can be used to prepare and regularly update a detailed inventory of local companies, their growth
intentions and orientations, and of local strategic assets. Public support measures should be
reviewed also towards fostering firm growth that is in alignment with the strategic interests of
the city, the local science community and the region. Efforts to further embed companies in the
locality should be therefore intensified in order to retain knowledge-intensive and high-value
activities in the region despite good reasons for settlement and expansion elsewhere.

Programmes should be designed to address a perceived lack of investment readiness in
certain sectors by improving the level of knowledge and know-how in assessing return potentials
and financing methods. Key features of such programmes include intensive working with each
company, and highly interactive workshops that involve experienced industry experts and
financing and investment companies. So far the support for enterprise funding and development
from within the University has assisted a number of spin-offs to obtain financing from banks. A
further formalisation of this practice would help to address the frequent problem of information
asymmetry in financing high-tech business proposals and would also increase the transparency
of this kind of university led support.

Key activities recommended for a tailored innovation support include instigate a discussion
about a one-stop-shop for science-industry linkages, conduct regular IP audits and inventories of
local companies with growth intentions and growth firms, design strategies for IP management,
devise public support activities for the post incubation phase of technology and knowledge
intensive businesses, identify sectors with a lack of growth and investment readiness and design
programmes and activities for these sectors.

Examples of programmes in these areas developed in other OECD countries include:

- Concentrating innovation support efforts in a one stop shop as a single and widely
  communicated information and assistance point (as Enterprise Agency models in UK).

- Generating an inventory of growth oriented firms and building a national strategy for
  cluster development (as the "National Cluster Strategy", Czech Republic).

- Designing and managing intellectual property strategies with a one-stop-shop approach
  for science and industry (as the "Centre for Intellectual Property Strategies", Japan).

- Providing a tailored hands-on support and reducing risk during the innovation process
  from the earliest possible stage (as "Intermediary Technology Institutes", Scotland,
  UK).

- Offering a complete programme of support for entrepreneurs in small business to
  increase understanding and utilisation of growth potentials (as the "Ready for Growth
  Programme", UK, Spain, and Greece).
ANNEX
Box 1. Knowledge Transfer Partnerships (KTPs), UK
(by Dylan Jones-Evans, UK)

**Description of the approach**

Knowledge Transfer Partnerships (KTPs) are programmes partly funded by the UK Government that help companies access the wealth of knowledge, expertise and resources available in Universities. KTPs basically involve a graduate working on a project identified as central to a company's future commercial development. Businesses involved in KTPs need to have identified a strategically important project, with the objective of improving turnover and gaining market share, intellectual property and a competitive edge.

A suitably qualified graduate – jointly supervised by the company and the University – will then work in the company for between one and three years to implement the project. This individual – known as a KTP associate – is jointly supervised by both the business and academic staff. Up to 60% of the cost of each Knowledge Transfer Partnership, including the KTP associate’s salary and the academic’s time, are covered by a government grant.

At the heart of each KTP is a relationship between a company and academic staff in UK Universities. University expertise is applied to a project that is central to the development of the business partner. Knowledge Transfer Partnerships enable each university to apply its wealth of knowledge and expertise to strategic business problems. KTPs are Government funded and enable UK businesses to benefit from the wide range of expertise available at each University.

Each KTP is managed by a team involving staff from the University along with the Company Partner and a recently qualified graduate recruited as the KTP associate. The graduate is appointed in open competition and may not necessarily be a former student of the partner institution. This ensures that the most relevant person is chosen for the programme.

For each KTP Associate on a two year Programme, regardless of the size of the company, the total budget is approximately EUR 150 000. The largest part of the funding employs the Associate and contributes to staff costs at each university for those directly involved in the partnership.

On recruitment, a KTP Associate becomes responsible for management of the Project, drawing on the expertise of the academics involved in the KTP, facilitating knowledge transfer, and implementing it within the business under the supervision of, and with input from, company staff. An Associate can be thought of as an ‘agent of change’ who, by applying their own recent ‘learning’ in an appropriate discipline, is helping the company to introduce new products or processes, or to develop or improve existing products or processes.

**Why the approach is relevant to Halle/East Germany?**

This approach is relevant to East Germany because it is a cost effective and simple way for business to access university expertise and a vital resource – in the form of the graduate associate – for their business.

The project is subsidised by Government but the business also contributes to the costs of the programme. In recent years, the KTP programme in the UK has moved its focus towards supporting small to medium sized enterprises and there are many examples of small firms across a range of sectors benefiting from different types of university expertise. Given the technological knowledge existing within East German universities, adapting the development of a programme such as KTP could be a ‘quick win’ in getting local businesses to work more closely with academic institutions.

It differs from the "Innovationsassistenten" programme (operating within some Land in
International learning models
Knowledge Transfer Partnerships (KTPs), UK

(With SMEs for a year or less. In contrast, the university in the KTP programme actually employs the graduate and, depending on the complexity of the project, the KTP project can last up to three years, which enables the student to undertake a Ph.D programme. Also, another key element of the KTP process is the transfer of knowledge from the senior academics involved in the project, both as supervisor to the associate but also in providing advice directly to the company.

Reasons for the success of the approach

The advantage of Knowledge Transfer Partnerships is that it can benefit all partners. For business, KTPs deliver tangible benefits such as new products and improved processes to the business leading to increased profitability, as well as bringing an additional resource – in the guise of a KTP associate – to the organisation.

For the graduate associate, KTPs prepare them for management positions in industry and, in many cases, enable them to become a valuable member of a small growing business. For universities, it can contribute to their third mission agenda by assisting strategic change in businesses by the commercialisation of their research results, and developing collaborations with innovative businesses. They may also gain ideas for further research and development projects, and enable staff to supervise and act as mentors for postgraduates working on company-based projects enhancing their own skills and knowledge, enabling them to apply knowledge and expertise to important business problems, gain experience of current business development, and generate research ideas and teaching materials relevant to business.

Two examples of successful KTPs are described below:

- **Richards, Moorehead and Laing Ltd.** The partnership with Cardiff University enabled the development of a system for using wastes as cement replacements, resulting in concrete products with enhanced properties. The company reported that the partnership resulted in strategic advantages and greater ability to market and exploit opportunities in the cement/concrete industry. It has also projected increased profits of GBP 50,000 per annum for the next three years as a result of the University's expert input.

- **Physical Acoustics Ltd (PAL).** The company identified the potential for commercial exploitation of acoustic emission (AE) in civil engineering in a previous research project with Cardiff University. The technique was refined through the KTP programme with the University's School of Engineering and it has been adopted by the UK civil engineering industry for inspecting steel bridges and is now being promoted worldwide. During the Programme a technology package was created which includes procedures for bridge testing, supported by laboratory and field test results. Method statements for bridge monitoring were also developed and are incorporated into the company's quality system. This commercial system enabled PAL to establish a presence in the civil engineering market and improve its competitive position. It expects sales of the system to increase its turnover by GBP 720,000 over three years and plans to create a subsidiary to market generic non-destructive testing techniques for civil engineering and employ two additional field-testing engineers.

The obstacles that were faced and the quality of the response taken

The main issue faced is that of ensuring that only good well crafted and relevant proposals are accepted for support. Both the company and the institution will contribute to the development of the research proposal before it goes to the funding advisor. Whilst this can take some time and cause frustration for the business, it does ensure that only worthwhile projects are approved for funding.

The key to ensuring the success of a KTP application is to demonstrate, unequivocally, that university knowledge can make a significant difference to the competitiveness of the recipient
International learning models
Knowledge Transfer Partnerships (KTPs), UK

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<th>Considerations for adoption of this type of approach in Halle/East Germany</th>
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<td>The main consideration is that of learning from the best practice of the KTP programme within the UK. The programme can be used to transfer knowledge into large and small firms within the region, although a balance has to be struck as it is relatively easier to work with large companies, although it may be more beneficial to the region to have greater knowledge transfer into small firms.</td>
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<th>Contact details and website for further information</th>
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| KTP Programme Office  
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OX11 0QJ  
Tel: +44(0)870 190 2829  
E-mail: ktp-help@ktponline.org.uk  
Website: www.ktponline.org.uk |
Description of the approach

Enterprise Champions (ECs) were first introduced into the thirteen Welsh higher education institutions in 2001 as a result of the recommendations of the Entrepreneurship Action Plan for Wales. At the time, it was generally accepted that entrepreneurship did not form a key part of the strategies of many academic institutions and that, unlike other countries (most notably the USA), the level of graduate entrepreneurship in Wales was comparatively low.

Being fully funded by the Welsh Assembly Government, partly through European Structural Funds, the role of the EC was to initiate and support a culture change in favour of entrepreneurship with Welsh universities in Wales through the following activities:

- carry out an entrepreneurship audit of the Institution;
- facilitate the piloting of enterprise training;
- provide or facilitate support including the entrepreneurship scholarship for students setting up in business;
- link with commercial managers at the college to provide live projects for trainees;
- promote the activities and benefits of entrepreneurship programmes to the institution;
- facilitate support for new business start-ups by graduates;
- establishing support networks for local entrepreneurs and students;
- helping to commercialise the results of research and intellectual property owned by institutions;
- assisting institutions to develop their professional services to local businesses; and,
- enabling business to access new technology developed in universities and colleges.

There was to be one EC per institution with an average annual budget of 100,000 euros. Annual targets were established by the Welsh Assembly Government for receipt of this funding. These were determined on a number of criteria, including attendees of accredited and non-accredited enterprise education options; recipients of business support services provided by the institution; number of academic staff trained; number of student graduate bursaries awarded; number of hours of additional entrepreneurship education resources developed; number of enterprise clubs established for students and graduates.

Initially, the role of the enterprise champion was to be taken by a senior person within the university with a direct line management responsibility to a pro-vice chancellor, and the initial job was advertised as such. However, in reality, many of the positions have been taken by lower ranked staff and therefore there has been limited success in integrating entrepreneurship fully into the strategy of a number of institutions. This is a vital lesson for Germany i.e. if such a role is to be taken within German universities, then it must be undertaken by an individual who has the position to influence strategic change within the organisation.

Why the approach is relevant to Halle/East Germany?

In Wales, it is generally accepted that EC role was created and resourced at a crucial time for the implementation of entrepreneurship as a policy objective in Wales and in the development of the wider HE agenda towards ‘3rd mission’ activities. Given the current position many universities in East

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International learning models
Enterprise Champions (ECs) in Wales, UK

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<th>Reasons for the success of the approach</th>
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<td>It is important to note that there is a provision of a specific funding stream to support the activities and appointment of ECs. For example, in Wales, it is generally accepted that without the policy and funding support provided by the Welsh Assembly Government and European Structural Funding, universities would not have employed an individual with specific responsibilities for promoting entrepreneurship.</td>
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<td>As a result, stakeholders have argued that the appointments of ECs were a 'quick win' for entrepreneurship policy in Wales providing a timely, simple and rapid physical presence to promote enterprise and entrepreneurship into all the HEIs in Wales.</td>
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<td>Part of the success of ECs has been their role in acting as a bridge between delivery of enterprise policy in the schools curriculum and the achievement of enterprise through business starts and, more importantly, contributing to a clearer definition of what entrepreneurship means in the context of different institutional and departmental settings.</td>
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<tr>
<th>The obstacles that were faced and the quality of the response taken</th>
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<tr>
<td>The key obstacle to the success of any such programme of enterprise champions is the extent to which ECs are able to access the senior management of the institution and, from this, the degree of commitment amongst the leadership of the institution to promoting and embedding entrepreneurship in the curriculum. This can be solved by ensuring that the enterprise champion is under the direct supervision of a senior manager, preferably at pro-vice chancellor level.</td>
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<tr>
<td>Within Wales, there has been a broad range of outcomes, depending on the size and activities of the host institution. Not surprisingly, ECs that are based in the smaller universities are perceived to have had a greater relative impact than in larger institutions. One solution to this is for larger institutions to adopt the model undertaken by Bristol University, where enterprise champions were appointed in individual faculties, rather than across the institution.</td>
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<tr>
<td>Another obstacle is related to the actual placement of ECs within the organisation of the university. The EC was intended to be a point of contact within the institution and to provide easy access to students for entrepreneurship enquiries. However, many of the ECs are located within the commercialisation department of the institution and there is little direct access with students. This makes it very difficult for the EC to act as a focal point or point of information for directing students to the appropriate programmes.</td>
</tr>
<tr>
<td>One possible solution is to have the EC office physically based within the Students Union or another similar location where there can be constant interaction with the student population.</td>
</tr>
<tr>
<td>Funding for a similar development in Germany should not be a problem as the development of ECs within higher education institutions would be classified by the European Structural funding imperatives, via the Lisbon agenda, of being crucial in creating a knowledge-based economy.</td>
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<th>Considerations for adoption of this type of approach in Halle/East Germany</th>
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<tr>
<td>Despite the relative success of the programme in Wales, there are clear lessons as to how any approach for the development of an enterprise champions initiative in East Germany can be developed further and improving the prospects of success. First of all, there should be clear job descriptions for entrepreneurship champions in East German HEIs so that the precise person specification to fit the</td>
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International learning models
Enterprise Champions (ECs) in Wales, UK

different traditions and character of each HEI.

More importantly, the enterprise champions should have direct line of responsibility to a member of the senior management of the institution, particularly if the EC is to play a key role in ensuring that there is a clear vision of where entrepreneurship fits into the University’s institutional strategy.

Each East German institution should also develop indicators of performance in terms of entrepreneurship and that these are identified before individual entrepreneurship champions are appointed.

Finally, the Welsh experience suggests that ECs should learn more from each other and that coordinating and learning activities should be established across East Germany that that will allow entrepreneurship champions to share good practice, come together to create new policy and strategy themes and work together to learn and implement across all HEIs.

Contact details and website for further information

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Welsh Assembly Government, Kingsway
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Box 3. Rochester Institute of Technology (RIT), US
(by Petr Adamek, Czech Republic)

Description of the approach

The Rochester Institute of Technology (RIT), the seventh largest private university in the US, is located in city of Rochester, State of New York, the home town of EastmanKodak, Xerox and Boushe&Lomb. RIT has over years successfully established an alumni network that consists today of 95 000 members from 50 US states and over 90 countries. Close contacts are maintained between alumni and actual RIT students. For example the University Magazine, a regular newsletter issued by RIT, contains a dedicated section on alumni with the aim of involving alumni that have become successful entrepreneurs in the daily University life. This is considered also a valuable contribution to entrepreneurship programmes in the University network.

The alumni network provides as well a substantial source of revenues for RIT. Alumni and friends of RIT can make donations for scholarships and student activities, as well as financially contribute to premises and buildings, including research facilities. A glance on some figures shows that the system Works well: young Alumni classes of 2004 and 2005 donated more than USD 10 000 each, with an average donation of USD 50 per alumni. The total number of graduated in the academic year 2005-2006 was 3 874; first-time alumni donors increased by 14% to 789. In 2006, total alumni participation was 7 479, including 670 alumni, who are currently faculty and/or staff members. Given the world-wide outreach of RIT alumni the system of online donation is facilitating financial contribution. The fundraising campaign at RIT collected over USD 250 million over the period of few years and exceeded initial objectives.

The alumni outreach and communication system at RIT is a complex mechanism that provides a number of opportunities for former students, their families and their firms, to interact with the University community. These include:

• Alumni recognition, as an important tool for building strong and lasting linkages with the University, including life-long email accounts and an up-dated contact database;
• Identity enhancing visual elements, such as the brick city, an identification with the University campus, and the tiger as the mascot of the University that plays an important role in RIT activities;
• Fundraising and a campaign driven approach with numerous opportunities for donations;
• Free circulation of RIT’s regular newsletters, and access to events (social, cultural, and educational) organised for students, alumni, sponsors and other partners; and,
• RIT Credit Card and discounted access to other RIT financial and cultural services for alumni (insurance, travel club, internet access discount, etc.) offered by RIT partners.

The fundraising and donation component of the alumni-University interactions does not only generate additional revenues for the University, it also constitutes a strong tie between former and actual students of RIT. Alumni are offered opportunities to donate offering financial contributions, time, expertise and experience in exchange of an involvement in professional and scientific activities at the University. The alumni network offers students and graduates opportunities for career development. Each alumnus also contributes to the extension of the network. There are numerous examples of firms that, having RIT alumni amongst their staff and management, decided to become business partners of RIT and thus contribute in various ways to the activities.

Why the approach is relevant to Halle/East Germany?

In the US it is natural to build long term philanthropic and communicative relationships with
Universities and HEIs. In Europe, and in particular in Central Eastern European countries, this tradition needs to be established. Students who create successful start-up firms or help their employers increase productivity and build competitiveness on knowledge and skills developed during their studies represent an endless resource not only for the firm, but also for their home universities. This is not only a monetary resource, but also a professional and a personal one.

It can be said that successful alumni indicate successful programmes. There is an opportunity cost associated with universities ignoring their alumni. The University community in Halle is in the process of building a strategy to increase contacts with and exchange between university alumni in order to benefit from positive and intense relationships with former students and built on their success. The access to regular information in the form of newsletters and mailing lists and the organisation of regular meetings on specific themes, similar to the RIT approach, may help to maintain contact. The involvement in the work of UNIVATIONS of those alumni that have become successful entrepreneurs could be a valuable contribution to entrepreneurship programmes in the university network. It could significantly enrich and enlarge the pool of knowledge and financial resources available for support and development of the well started local/regional innovation system.

Contact details and website for further information

Rochester Institute of Technology
One Lomb Memorial Drive
Rochester, NY 14623-5603
Rochester Institute of Technology (RIT): www.rit.edu/
RIT’s alumni network: www.rit.edu/alumni.html
Fundraising and donation: www.rit.edu/~giving/
Box 4. Centre for Intellectual Property Strategies (CIPS), Japan
(by Jonas Scholze, OECD)

Description of the approach

The Centre for Intellectual Property Strategies (CIPS) is an institution within RIKEN, Japan’s largest research centre. It consists of a multitude of research institutes with different headquarters distributed across Japan. Additionally there are some international branches in South East Asia and Europe. RIKEN was founded in 1917 by a range of private companies as a cooperative centre for joint research. In 1958 the centre changed to a public research institute. Since 2003 it has been administered as an independent administrative institution within the Japanese Ministry of Education, Culture, Sports, Science and Technology. Today it is one of the world leading research centres for basic and applied research in the field of physics, chemistry, medical science, biology and engineering.

CIPS was established in April 2005, is located in Saitamo near Tokyo and acts as mediator between the research centre and the private industry. It aims to coordinate tasks connected to the protection of intellectual property and to capitalise on research achievements of the RIKEN institutes. However, its task is not confined to patenting and licensing of inventions and research achievements and associated legal processes. It is also used as a contact point for academic-industry linkages. Such programs enable and fund joint research activities between private companies and RIKEN research institutes. Thus CIPS continues to function as the increasingly popular approach of a ‘one-stop shop’ – a single internal contact point for a range of functions and services. The additional financial support received by private companies enables a vitalisation of the research centre through reinvestment in staff expertise and institutes.

The annual budget (according to 2006 statistics) amounts to JPY 88 000 mn (about EUR 557 mn) with a share of EUR 12.5 mn for CIPS. The funds for commissioned research in 2006 amounted to JPY 12 600 mn (EUR 80 mn). Thus the share of the total budget is 14.4 percent.

Cooperation and transfer of technology between industry and independent research institutions requires the coordination of three main fields including research and development, protection of intellectual property and the promotion and utilisation of research achievements. A coordinated integration of these factors provides potential value for society as well as for both partners. All these tasks are coordinated and carried out by CIPS. The intellectual property normally belongs to RIKEN, with preferred treatment and an exclusive licence for the participating company. Among others, the following projects are depicted as an assortment of currently running cooperative programs:

The Integrated Collaborative Research Program follows the integrative approach towards cooperative research where both RIKEN Institutes and private industry are recognised as equal partners. Companies can propose research projects with potential for commercialisation. RIKEN then selects which projects to undertake. Each project is carried out by a team consisting of researchers from industry and from RIKEN working together.

Sponsored Laboratory. This program is funded by the private sector only. Top researchers are invited by companies to contribute to ongoing projects. Furthermore, entire labs such as the Abe Laboratory are funded by industry. The Abe studies and tests functional mechanisms of biologically-active substances derived from hornets.

Commissioned research and technical guidance. Companies propose projects with suitable RIKEN institutes. RIKEN works on the proposed projects or provides technical guidance as a
Consultancy. Results achieved from commissioned research belong to RIKEN but the company is given preferential treatment, including an exclusive license.

Company-Sponsored Research Trainee. This program is part of a technical consultancy service provided by RIKEN. Private sector researchers and engineers are given the opportunity of a traineeship to enhance their knowledge and skills and gain practical experience.

Why the approach is relevant to Halle/East Germany?

If disregard the scale, there are a range of structural factors that coincide with RIKEN and the Weinberg Campus of Halle. Firstly, both centres bring together a consortium of independent institutes with a range of expertise on natural science and focal points on biology, physics, chemistry and pharmacy. Both Halle and RIKEN are publicly funded but have an independent status. Though RIKEN is not directly connected with Tokyo University or any other universities, the model can be adopted by Halle to capitalise on the same advantageous strategies.

Through the collaboration with engineers of private companies, research staff and scientists receive an improved insight on approaches to applied research. A direct exchange of experiences (in particular the exchange of tacit knowledge) with researchers working on commercially-orientated projects could be fostered in Halle. This exchange unlocks potential and develops a more entrepreneurial attitude in scientists and research staff of the university, through encouraging them to derive commercial value from their research achievements.

Reasons for the success of the approach

CIPS supports the cooperation with the private sector in the field of research and development in order to receive a commercial value from research achievements. With the creation of CIPS, effective academic-industry cooperation is guaranteed. The institution conducts all administrative activities including communication. Researchers and engineers from the private sector take part in RIKEN research programs, while collaborative research is initiated to achieve comparative advantage through combining R&D expertise. Costs of programs for the promotion of research results are jointly borne by RIKEN and the industry.

The ‘one-stop shop’ model ensures a quick approvals for research applications and project schemes. This provides a contact point which can directly provide competent knowledge about internal structures of RIKEN centres, current projects, key activities and research capacities to private companies. Through streamlining administration, bureaucratic expenses are reduced, which in turn attracts private firms.

The obstacles that were faced and the quality of the response taken

Until the end of the 1990s there was no flexible cooperation between companies and public research institutions or Japanese universities. The collaboration was stipulated by contracts with a possible annual extension only. Financial means from industry was not provided directly to the institutes but could only be given to the Japanese Ministry of Education, which has a complex budget structure. Extensions of projects and involved financial outlays met enormous administrative efforts. Moreover university professors were blocked by Japanese law from joining executive boards of private companies. Consequently academic-industry technology transfer and innovation capabilities were hampered. Thus, in comparison to USA or Europe, Japanese institutes appeared quite unattractive to the private sector.

To foster international competitiveness, Japan’s government initiated a range of programs to foster a closer collaboration between universities, government and non-governmental research institutes and industry. Through the creation of particular funds by relative ministries (such as the Ministry of Forestry, Agriculture and Fishery or the Ministry of Trade, Economy and Industry) regional
International learning models
Centre for Intellectual Property Strategies (CIPS), Japan

cooperation programs were developed and enhanced. The number of centres for cooperative research at universities as well as the number of academic-industry research projects increased dramatically. Furthermore, corresponding amendments and new laws were enacted to reduce legal hurdles and close gaps. Thus Japan was able to close the gap with the U.S. and Europe.

Contact details and website for further information

  Intellectual Property Planning and Promotion Team
  Centre for Intellectual Property Strategies
  2-1, Hirosawa, Wako, Saitama 351-0198, Japan
  CIPS: http://r-bigin.riken.jp/bigin/engn/index.html
  RIKEN: www.riken.jp/engn/index.html
Action Plan

(This "Action Plan" builds on the recommendations given in a draft summary report on the City of Halle (Saxony-Anhalt), September 2006, presented at a regional workshop on 27 September 2006 in Halle, Germany)

Facilitating University Entrepreneurship

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<th>What</th>
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<td>Promote entrepreneurship and associated skills</td>
<td>There seems to be a general concern that the scale of entrepreneurial activity in Halle is not as great as it should or could be. The issues behind this concern are not the most susceptible to rapid change: attitudes of staff and students to enterprise and their ability to undertake the activity, the scale and breadth of research projects, the ability of the university to attract academics from the rest of Germany and the rest of the world drive its research effort, and the ability of the university to develop industry links around its research – if not in Saxony-Anhalt, then from a much wider area based more on research topic than geographical proximity. Examples of good practice in promoting entrepreneurship and the skills associated with it have already been presented and there is more which Halle could do. Home-grown entrepreneurs indicated that this was a lack. The Institute for Entrepreneurship and Innovation may represent a worthwhile development in this respect. The factors involve the universities in the region making a greater national and international impact. This requires investment to attract academics and create attractive facilities, as well as a promotional strategy to make the Halle universities and their work much more widely known on an international scale. Just as internationalisation is vital for fast-growing small businesses, so it is for a research-based university. There may well be merit in some aspects of this work done through a partnership between the regional government and the universities.</td>
<td>HEIs and their academic and administrative staff, Chamber of Commerce and Trade, other business support organisations, technology and innovation support agencies, local government, relevant Land government ministries and agencies</td>
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| Review the current extent and utilisation of public funding | The issue of the extent of public funding supporting enterprise development needs to be tackled. Not only is it unsustainable, but it has the potential to undermine the commercial dynamism which is essential to development of a thriving small business economy in any context – the university circumstance is no exception. Of course, the present funding programmes are intended to kick-start activity and not to support it in the medium or long term. However, experience in other jurisdictions suggests that the transition to self-sufficiency is usually very difficult and much of value can be lost in the process. It is therefore recommended that the existing leaders of enterprise development involve all the stakeholders in the Halle community in devising a strategy for developing a more commercial approach to their work. This would mean | Relevant Land government ministries and agencies, relevant Federal ministries and agencies, local government, technology and innovation support agencies, UNIVATIONS, Technology and Company Founder Centres (TGZs), Weinberg Campus |
looking at ways to minimise their dependence on public funding and increasing the mechanisms of the commercial marketplace in the work of their organisations. This would have a beneficial effect on the outlook and function of organisations, even whilst the present level of subsidies are available, and they would be in a much more robust position to develop their own strategies for the future. This process should include putting in place incentives for management involved in the investment process to encourage the achievement of challenging commercial targets for their operations e.g. returns on real estate, performance of funds under management whether their provenance is the public or private sector. Looked at from the point of view of the current situation in Halle, there may not seem to be a great need for these changes, and little urgency either.

Discuss the role of local leadership

There seem to be a broad range of organisations and individuals enthusiastically working towards the common goal of boosting entrepreneurship in the Halle universities community. The leadership of key academic staff was highlighted in the interviews as being an important component of this effort. However, their role could be further institutionalised with the establishment of a consultative board including key academic staff and a range of organisations contributing to economic development. Such arrangements could also be utilised to facilitate financing of business ideas.

Develop programmes to boost the numbers of business angels

The objective of such programmes is to increase the pool of business angel investors and thus boost the supply of equity to small firms. This means recruiting high net worth individuals with relevant business experience and an interest in helping to build, support, mentor and invest in early stage companies with growth potential. Often potential angels are reluctant to get involved partly due to a lack of knowledge about what is entailed and a lack of relationships with existing angel investors. The attraction of “knowledge angels” to pass on relevant professional and business experience to investee companies, without necessarily investing themselves has proved a successful ingredient of such programmes elsewhere. Widespread marketing campaigns can be helpful in increasing a general awareness of and interest in business angels activities.

Help firms to assess their own investment readiness

Programmes should be designed to address a perceived lack of investment readiness in certain sectors by improving the level of knowledge in firms about their own growth and return potentials and methods of financing. Such programmes have proved to raise the level of deal flows elsewhere. Key features would include intensive working with each company; highly interactive workshops based on role play exercises and delivered by experienced industry experts like accountants, business angels, venture capital companies and schemes, public and private banks, Chambers of Commerce and Trade and Crafts, business support organisations, technology and innovation support agencies, local government, relevant Land government ministries and agencies, relevant Federal ministries and agencies, UNIVATIONS, Technology and Company Founder Centres (TGZs), Weinberg Campus.
lawyers, business angels, clearing banks, venture capital firms and corporate finance firms and a free diagnostic investment-readiness tool. Such programmes enable firms to assess their own investment readiness, obtain feedback on their strengths and weaknesses, their ability to access equity finance, and increase investor interfaces with underinvested sectors.

Increase international networking efforts

Active involvement in international networks would help to contribute to the internationalisation of the local economy. It is important to expose leading university managers and policy-makers to colleagues working in other jurisdictions and to establish working networks with the people involved. This could be tackled through active involvement in international networks of economic development practitioners such as the European Association of Development Agencies (EURADA), which is currently planning to launch a European network of universities and regions, the International Economic Development Council (IEDC) in the U.S., the European Business Angels Network, and the National Business Incubation Association as well as the activities of the OECD LEED Programme. This exposure to other practice could be complemented by study visits – the internet is rich in information about what universities around the world are doing to boost enterprise – and it is suggested that the U.S. might have examples which would be particularly helpful to the Halle community. Such active involvement in international networks would also help to promote Halle more widely and contribute to the internationalisation imperative recommended above.

* This is not an exhaustive list of stakeholders and actors. It needs to be adapted to and completed for the local context.

University entrepreneurship training and knowledge transfer

**What**

*When resources allow it, capitalise on the interest of large numbers of students from across the faculties*

**How**

While the current approach is outstanding, reliance on extracurricular workshops and networking events could mean inconsistent and spotty coverage of topics that could be better covered in a more traditional academic setting. Appropriate curriculum additions will help students be better prepared to seek capital and operate businesses in the real world. Because of misperceptions about the availability of capital, students should be better trained regarding how to access capital. Each university in Halle must be prepared to hire additional faculty and to provide substantial resources for curriculum development. In addition, efforts should be made

**Who**

HEIs and their academic staff, UNIVATIONS, Technology and Company Founder Centres (TGZs), Weinberg Campus, business support organisations, technology and innovation support agencies
to ensure that programmes remain grounded in the real world and that business people participate heavily in mentoring students even if that means hiring professional as well as academic staff. As with any university, the key to accomplishing these goals would be to link entrepreneurship to the mission of the institution.

### Entrepreneurship education in Halle should focus more on high-growth businesses and internationalisation

The goal should be to help reinforce a culture for entrepreneurship beyond self-employment. University educated entrepreneurs, particularly those with advanced degrees, should be inspired to think more ambitiously about the potential of businesses they launch. The reasoning behind these recommendations is that high growth, high potential, high technology businesses will have a far greater impact on the economic well being of the region - especially in terms of job creation. It is clear that appropriate technologies and financial resources exist for more ambitious ventures but the culture of high risk, high potential entrepreneurship is not evident. Additional resources will be required to hire faculty and staff with the skills necessary to ramp up these technology commercialisation efforts or to develop these skills in house. In addition, a shift in culture must be proactively pursued.

### Vigorous effort to endow UNIVATIONS and to ensure its long-term sustainability

One option that should be explored would be for Univations to take an equity stake in each company it assists. Over the long-term, one major success or a few moderate successes would have a large positive financial impact on the programme. Other options would be to increase financial sponsorships from local businesses.

### Processes should be designed and implemented to better monitor the economic and social impacts of educational and extracurricular entrepreneurship programs

Currently there are a lot of informal workshops, networking functions and other programs that appear to be working based on anecdotal evidence. However, there is no way to directly measure the impact of these informal programs. Having quantitative measures of results would make it much easier to convince potential sponsors to provide resources for the programs. These data would also help convince other regions of the value of replicating successful programs.

### Recognise the value of intellectual property created and more aggressively protect intellectual-property

These Universities are currently missing many opportunities to capture economic value from their intellectual property. To capitalise on underexploited means of commercialisation, universities should work to reduce barriers to professors starting businesses and should, in the long run, provide incentives for professors to start businesses. Incentives might include reduced teaching requirements, equity in start-ups, and royalties from licenses to those start-ups. Furthermore, the institutions

| HEIs and their academic staff, UNIVATIONS, Technology and Company Founder Centres (TGZs), Weinberg Campus, business support organisations, technology and innovation support agencies, public and private banks, venture capital companies and schemes, business angels |
|---|---|
| UNIVATIONS, Technology and Company Founder Centres (TGZs), Weinberg Campus, business support organisations, technology and innovation support agencies, Chambers of Commerce and Trade and Crafts business support organisations, technology and innovation support agencies, local government, relevant Land government ministries and agencies, relevant Federal ministries and agencies |
| Relevant Land government ministries and agencies, relevant Federal ministries and agencies, HEIs and their academic and administrative staff |
should proactively develop an entrepreneurial mindset and skill set amongst professors and administrators. Universities in Halle could benefit from studying examples of how American universities have responded to the 1980 Bayh-Dole Act. The example of how the University of Illinois at Chicago aggressively launches businesses to commercialise university owned intellectual property should be particularly helpful. Examples show that high technology ventures must involve the inventor if they are to have full legitimacy in the eyes of investors. It is clear that spin-offs from the universities in Halle are handicapped by inability of professor-inventors to joint those businesses.

* This is not an exhaustive list of stakeholders and actors. It needs to be adapted to and completed for the local context.

### Infrastructure for innovation and Internationalisation of SME activity

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<td><strong>Narrowing the current specialisation of innovation infrastructure</strong></td>
<td>The current areas of core innovation competence seem to be too broad in their definition and are followed by many other regions in Europe. In order to enable the crystallisation of a Halle-specific global competitive advantage, the development of a more sophisticated cluster approach in activities where Halle and its surrounding region already have demonstrated international success is recommended. This could help prepare more focused strategic project selection approach and prioritization in terms of level of support. This recommendation is illustrated by the learning model on the National Cluster Study in the Czech Republic.</td>
<td>Local government, relevant Land government ministries and agencies, relevant Federal ministries and agencies, Technology and Company Founder Centres (TGZs), Weinberg Campus, Chambers of Commerce and Trade and Crafts, business support organisations, technology and innovation support agencies</td>
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<td><strong>Adopt a more strategic approach in project selection and information dissemination</strong></td>
<td>Priority setting in innovation infrastructure must be future oriented. The support services need a stronger reference to, partially already introduced, criteria like technological level, coherence with strategic core competences of the region, potential for value added, export orientation and, most importantly, global market potential. The impact of business internationalisation activities on the local economy in Halle and the surrounding region could be used for promotional campaigns like &quot;Halle goes global&quot;.</td>
<td>UNIVATIONS, Technology and Company Founder Centres (TGZs), Weinberg Campus, local government, Chambers of Commerce and Trade and Crafts, business support organisations, technology and innovation support agencies, venture capital companies and schemes, business angels, public and private banks</td>
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<td><strong>Identify complementary strategic assets</strong></td>
<td>The physical infrastructure for innovations in Halle seems to be in a good shape. However, there are missing or underrepresented components in the broader innovation support infrastructure, like specialist equipment providers and research specialists. Efforts should be made to identify such assets in other locations within Germany or abroad and to create connections with them. A well functioning network including industry experts is needed to conduct a detailed inventory and assessment</td>
<td>UNIVATIONS, Technology and Company Founder Centres (TGZs), Weinberg Campus, local government, Chambers of Commerce and Trade and Crafts, business support organisations, technology and innovation support agencies, venture capital companies and schemes, business angels, public and private banks</td>
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of local strategic complementary assets. It is important to develop and maintain mechanisms that allow for an acceleration of time-to-market and time-to-money procedures of locally generated innovation.

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<th>Extend public support measures to the post-incubation period</th>
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<td>It seems that pre-incubation, pre-start-up and start-up level assistance is available for those who have business ideas and horizontal initiatives exist (FUTUREGO, business planning competition) to ensure the pipeline of business ideas and establish a culture of entrepreneurship in Halle and the region. The idea of a follow up institution or service that will directly assist firms in post-incubation period is right on target and in terms of resource allocation, it should become a priority. Even though the Institute for Entrepreneurship and Innovation is mainly research oriented, it can perhaps become a more pro-active partner for the firms that successfully leave the incubation period and become regular small firms that nevertheless require specific knowledge and expertise that is often external to them. Current support activities for firms in the post-incubation period need to be continued and intensified. The strategic objective of public support measures should not only be on preventing firm collapse caused by a lack of know-how in growth management and crises in growth processes, but also to ensure that firm growth is in alignment with the strategic interests of the city, the local science community and the region. Efforts to further embed companies in the locality should be intensified in order to retain knowledge-intensive and high-value activities in the region despite good reasons for settlement and expansion elsewhere. It is not easy to do this and there is no one single recipe that can work everywhere, however a useful concept is introduced with the international learning model on it is in Scotland.</td>
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<th>Increase private involvement in infrastructure development</th>
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<td>Whilst public subsidy and support may continue for enterprise promotion in Halle for a long time to come, it is strongly recommended that private finance is introduced into the real estate component of the enterprise strategy as speedily as possible. In addressing future needs of companies for a greater diversity in quality and size of physical innovation infrastructure, private high-tech facility developers and managers should be consulted, at an increased level of current involvement, and potentially attracted to develop and operate space. For the future viability of these facilities it will be important to see the real estate as an asset capable of producing a commercial return, against which maybe also further funds could be secured. Successful firms will need to develop rapidly in the next years. A five person firm might need space for 100 employees in the next three years if their new product market entry proves successful. Places like the Weinberg Campus must be ready for this, otherwise there might be a risk that successful start-ups will seek space and people elsewhere.</td>
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<th>Exploitation of innovation</th>
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<td>The existing innovation infrastructure should be used more intensively to foster</td>
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through a wider group of firms collaboration between HEIs and local companies of all sizes as well as with large companies located elsewhere but with relevance for the local value-chains. The university environment in Halle is very active and is a clear leader and orchestrator of innovative activity in the area. Previous strategy has been based on pushing innovations by new firm formation. Currently there is a full cycle being developed with new focus on post-incubation. However, the role of the Universities and the already functioning innovation system could be also to pull ideas from existing industrial firms, SMEs and large companies, those that have not been assisted by UNIVATIONS or created by professors on campus, have their customer base or feed directly in relevant value chains and thus any locally created innovation could be readily tested with the markets. The same applies for foreign companies being present in the region, but also firms located abroad with activities relevant for the local value-chain and for a further specialisation of innovative firms in Halle. Co-operation with multinational companies can help to accelerate and scale-up commercialisation processes because of their strong access to markets. During the visit to Halle the review panel met with a firm that tested an innovative data-projector related pointer device that could be delivered to market faster (or dropped because it already exists, which is also an option that must be carefully considered prior to investment in any innovative activity), if co-operation were initiated at an early stage with market leaders.

* This is not an exhaustive list of stakeholders and actors. It needs to be adapted to and completed for the local context.

**INNOVATION SUPPORT AND PUBLIC AND PRIVATE NETWORKING**

| What | How | Who*
|------|-----|-----
| Avoid segregation of non-university entrepreneurship support | Under the premise of tailoring policy and programmes to the local and regional context, full use should be made of the existing communication channels between different government levels, so that objective and target setting processes in entrepreneurship and innovation policy could reflect the whole variety of local contexts and local needs. More formalised involvement of line Land ministries in existing local networks, would offer opportunities to further develop and tailor local approaches to further stimulate the participation of local SMEs in knowledge-based and high-tech industries. | UNIVATIONS, Technology and Company Founder Centres (TGZs), Weinberg Campus, relevant Land government ministries and agencies, technology and innovation support agencies, business support organisations, Chambers of Commerce and Trade and Crafts, HEIs and their academic staff, UNIVATIONS, Technology and Company Founder Centres (TGZs), Weinberg Campus, Chambers of... |
| Enhance co-operation between the HEIs and the | In general, local co-operation in innovation activities and R&D based networks among firms is limited. Partly this can be seen as due to the egoistic behaviour of firms. Networking, however, can be facilitated by the existence of a co-ordinating | |
local business community

organisation, which is considered by local companies as being impartial or at least enabling knowledge and know-how spill-overs. The position attained by the University community in the local innovation support system is complemented by technology and innovation centres and incubator facilities that enable the use university research facilities by local companies. However, universities are not usual interlocutors for local firms. Even high-technology and growth companies direct, in first place, a request for support or interaction to the Chambers. A closer co-operation, perhaps even on a formalised level, between the HEIs and the Chambers could therefore be useful to reducing the distance and barriers between the University and local enterprises. This could stimulate a more positive public attitude towards technological development and innovative SMEs. In addition, a further intensification of communication and interaction between the university and the local business community could help to extend current technology transfer activities by adding contract research activities and consultancy by the University. It would fruitfully integrate technology transfer with wider entrepreneurship education at university.

Concentrate efforts and create a one-stop shop for science-industry linkages

The establishment of a one-stop shop for spin-offs and companies interested in technology transfer should be further discussed. Such an entity could help to increase efficiency and effectiveness of public support programmes, provide potential beneficiaries with information on existing programmes to increase science-industry linkages, and contribute to a further tailoring of policy interventions to local needs and streamline procedures. Experience from other OECD countries demonstrates positive results from one-stop shops that are run as a public-private partnership. Public and private objectives are negotiated to find a compromise that allows for public-private sharing of risks and costs. Expected results include: a better exploitation of complementarities between public and private R&D; the identification and filling of gaps in infrastructure; and the overall increased leverage of public support. It is important that the one-stop shop is familiar with the R&D activities and specialisations of SMEs in Halle and its surrounding region and that the agency can build on long-standing formal and informal relationships, with both other actors in innovation support and the local business community. To be effective, such an agency should stimulate the innovation and technology aspirations of companies: it should be in a position to proactively respond to existing needs, rather than simply dealing with specific company requests. UNIVATIONS, given its current central role in existing networks and the general support received by local and Land level actors, seems to have the capacity to become an interlocutor for local companies, if they remain open to both the need of HEI and non-HEI entrepreneurs.

Increase the outreach

An increased outreach or marketing orientation of UNIVATIONS would increase the attractiveness of the local science industry environment for scientists and companies from abroad with intentions to internationalise their activities. A strategy to increase
contacts, with and exchanges between University Alumni should be built. Besides the access to regular information in the form of newsletters and mailing lists, the organisation of regular meetings on specific themes may help to maintain contact. The involvement in the work of UNIVATIONS of those Alumni that have become successful entrepreneurs could be a valuable contribution to entrepreneurship programmes in the university network. UNIVATIONS has the capacity to develop the University of Halle into a place that anchors a network, which is locally/regionally embedded, with global constituents, and thus enables for a participation in the global resource flow around high-technology, something which can lead to local economic benefit.

* This is not an exhaustive list of stakeholders and actors. It needs to be adapted to and completed for the local context.
List of interview partners

(Review panel study visit to the City of Halle, 28 – 30 June 2006, in alphabetic order)

Mr Jürgen Andrick Geschäftsführer Innovationen und Umwelt Industrie- und Handelskammer Halle-Dessau
Mr Gerald Böhm Vorstandsvorsitzender ACGT - Progenomics AG Biozentrum Halle
Mr Eric Bourgett Geschäftsführer, Prokurist IBG Beteiligungsgesellschaft Sachsen-Anhalt mbH
Mr Robert Bratzke Projektmanager UNIVATIONS - Netzwerk für Innovation, Existenzgründung und Wachstum
Ms Petra Bratzke Leiterin der Agentur für Arbeit Dessau
Mr Steffen Dölling Projektmanager futurego Sachsen-Anhalt, Schüler Businessplanwettbewerb des Landes
Ms Gritt Eisenkopf Wissenschaftliche Mitarbeiterin im Prorrectorat, Martin-Luther-Universität Halle
Mr Jöran Fricke Projektleiter Business Angels Netzwerk Sachsen-Anhalt Investitionsbank Sachsen-Anhalt
Mr Mike Grossmann Technologie- und Gründerzentrum Halle GmbH (TGZ) & Weinberg Campus e.V.
Mr Manfred Jäger Price IT gmbh
Mr Prof. -Ing. Jörg Kirbs Prorrector für Forschung und Existenzgründung Hochschule Merseburg
Mr Thomas Kühne Bankbevollmächtigter, Förderberatungszentrum Investitionsbank Sachsen-Anhalt
Mr Walter Mittelbach Vorstand SorTech AG
Mr Prof. Reinhard Neubert Prorrector für Forschung, wissenschaftlichen Nachwuchs und internationale Beziehungen Projektleiter UNIVATIONS Martin-Luther-Universität Halle
Mr Reinhard Paschke Geschäftsführer Bio Service GmbH
Mr Falk Ritschel Projektleiter Entrepreneurship Monitor Sachsen-Anhalt Institut für Innovation & Entrepreneurship (IIE), Wirtschaftswissenschaftliche Fakultät Lehrstuhl für Marketing und Handel
Ms Petra Sachse Ansprechpartnerin für Technologie/ Innovation Wirtschaftsförderung Halle Stadt Halle
Mr Achim Scharschmidt Abteilung Starthilfe Industrie- und Handelskammer Halle-Dessau
Mr Ulf-Marten Schmieder Projektkoordinator UNIVATIONS - Netzwerk für Innovation, Existenzgründung und Wachstum
Mr Reinhard Schröter Geschäftsführer Starthilfe und Unternehmensförderung Industrie- und Handelskammer Halle-Dessau
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<th>Mr</th>
<th>Jens Schwarzer</th>
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<td>Projektmanager UNIVATIONS - Netzwerk für Innovation, Existenzgründung und Wachstum</td>
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International review panel and workshop participants

Petr Adamek has been a consultant and co-owner of the Berman Group, a Prague-based economic development consultancy, since 1999. He is in charge of competitiveness and innovation projects in the Czech Republic, namely worked on the Czech Republic’s Cluster Study for CzechInvest in 2005/2006 as a team leader and has worked as a member of the innovation and competitiveness team for the Structural Funds Absorption Capacity project in 2004. Also Mr. Adamek works as a consultant on a FDI certification project in Ukraine and on a LED project in Serbia. Mr Adamek graduated in 1997 from Czech Technical University in Prague in the field of technical cybernetics and artificial intelligence and obtained in 1998 he an MBA degree from the Rochester Institute of Technology, N.Y. Between 1995 - 1997 Mr. Adamek worked as an economic development consultant for Barents Group, LLC, a fully owned subsidiary of KPMG, nowadays marketed as Bearingpoint. Between 1997 - 1999 Mr. Adamek worked for Berman Group, Inc. a small US-based economic development consultancy that enabled its key Czech staff a management-buyout in 1999. (E-Mail adamek@bermangroup.cz)

Andrea-Rosalinde Hofer joined the OECD in 2004 as a Policy Analyst in the field of local governance. She is based at the LEED Trento Centre for Local Development in Italy where she manages the Centre's activities related to partnerships and local governance and the OECD LEED Forum of Partnerships and Local Governance. Prior to this she worked for the United Nations Development Programme as an expert and regional project co-ordinator for local governance. (E-Mail: andrea-rosalinde.hofer@oecd.org)

Dylan Jones-Evans is Professor and Director of the newly formed National Entrepreneurship Observatory for Wales, which recently attracted the largest entrepreneurship research grant in the UK – GBP 1.7 million. At 29, he was appointed as the youngest professor of business and management in Europe, holding the chair of entrepreneurship and small business management at the University of Glamorgan. He has subsequently held academic chairs at the University of Wales Bangor and NEWI in Wrexham, and has developed over GBP 20 million worth of projects for all three institutions. He is currently adjunct professor of entrepreneurship at the Turku School of Economics in Finland. He has published over one hundred academic articles within refereed journals, academic books and international conferences, and is the author of the best-selling textbook 'Enterprise and Small Business', published by the Financial Times. He is also Chairman of Outlook Expeditions Ltd, a Snowdonia-based fast growing business and works with a number of other small growing firms in Wales through his role as director of the Wales Fast Growth Fifty - the annual barometer of entrepreneurial development within Welsh SMEs. (E-Mail: dylan.je@ntlworld.com)

Holger Kuhle is vice-president of A.E.I.D.L. (Association Européenne pour l’Information sur le Développement Local – a.s.b.l.) – a European association based in Brussels, which acts as both a technical co-operation office for the EU-Commission (LEADER, DG Landwirtschaft (Agriculture); EQUAL, DG Beschäftigung (Employment); RegioNews DG Regio) and also works on a diverse range of work for the EU-Commission (communication for DG Regionalentwicklung (Regional Development); evaluation of EU-programmes such as the Belgian territorial employment pact). Dr. Kuhle has also been project manager for economic support at the Investment Bank Berlin since June 1999. He focuses mainly on local development, labour market- and economic support policies, and transnational co-operation. He has already participated a range of different EU-projects, for example the current the Interreg III C-projects "TEICO-Net" (Technology Enterprises Innovation Co-operation Network) for the development of entrepreneurial co-operation clusters in the ‘Baltic-Region’, the ‘Fünf Städte Oderregion/ Five Cities in the Oder Region’ and “TRATOKI” (Transregional Toolkit for
Dr. Holger Kuhle is an expert for different projects, co-operatives and assemblies, e.g. in the joint French, British, US and German research association “Evaluating local administrative services and policies that leverage private finance of small projects in inner-city areas”, and the OECD LEED Programme (Local Economic and Employment Development). (Email: holger.kuhle@berlin.de)

Andrea Manuelli is director of a Local-Global, a local development agency in Florence, Italy. He holds a MA in Economic Development (Institute of Social Studies, The Hague) and has 14 years of consultancy and research experience in local development, including international experience. He has a solid knowledge of Italian development, works directly together with local businesses and local business support institutions in Tuscany and was actively involved in supporting the development of local industrial SMEs clusters. (Email: manuelli@local-global.it)

Jonathan Potter joined the OECD (Organisation for Economic Co-operation and Development) in 1997 as a senior economist in the LEED Programme. At the present he heads OECD activities in the field of entrepreneurship, local self-employment and employment creation, as well as the evaluation of local economic development policies. He is managing three groups of multi-country review studies: Local Entrepreneurship Reviews; Reviews of Foreign Direct Investment and Local Development; Reviews on Entrepreneurship and Local Innovation Systems. He has edited a range of OECD publications, including “Best-Practice in Local Development, Globalisation and Decentralisation: Implications for Policymaker” and “Global Knowledge Flows and Economic Development and Entrepreneurship: A Catalyst for Urban Regeneration”. Before joining the OECD he worked for six years as a senior consultant for the PA Consulting Group, where he became specialised in evaluation of policies. During this period he undertook a range of evaluations and feasibility studies relating to the economic development for the European Commission, national ministries, regional and local governments as well as development agencies. His main tasks included the evaluation of British Enterprise Zones and an international evaluation about supporting SMEs through British agencies for promoting business relations. (Email: Jonathan.Potter@oecd.org)

David Walburn is a Visiting Professor at London South Bank University where he is Director of the Local Economy Policy Unit (LEPU). He is the Managing Editor of the LEPU’s journal “Local Economy”. He leads the SME Group of the London Development Agency’s Private Investment Commission. He is a member of the Professional Chamber of the Enterprise Policy Group run by the European Commission’s Directorate General for Enterprise and Industry. He is also the chair of Capital Enterprise, the organisation which represents London’s Enterprise Agencies. He was Chief Executive of Greater London Enterprise (GLE) for 10 years until 2002. Amongst a broad range of economic development activities, GLE is a leading supplier of financial services to SMEs covering equity finance from managed funds and from business angels, invoice finance, loans and grants. David now works as a policy adviser to GLE, and represents the organisation at the European Association of Development Agencies (EURADA). He was the President of EURADA from 2003 until 2005. He is also Chairman of the Board of London Seed Capital, through which GLE carries out its business angel activities. David Walburn graduated in Politics and Economics from the University of Durham in 1966 and holds a Master’s Degree in Political Science from McMaster University in Canada. His policy specialisations are entrepreneurship and SME finance. (Email: davidwalburn@london.com)
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