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**THE OXFORDSHIRE ECONOMIC
OBSERVATORY PROJECT: RELEVANCE OF
THE MODEL TO DEVELOPING COUNTRIES**

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1. INTRODUCTION

A number of consistently occurring interlocking themes represent the consensus on the targets of policy-makers with responsibilities for raising the level of regional economic and social development. These include innovation, skills, clusters, university-industry interaction, infrastructure, sustainability and urban structure. These can be seen for example in the draft regional economic strategy for one of the UK's regional development agencies, SEEDA (www.SEEDA.co.uk). While these are components of common objective, numerous agencies at regional and sub-regional level have responsibilities for delivery of policy. Hence there is a need for a holistic approach to data collection and analysis within multi-agency environments to overcome fragmentation of information, hence improve the policy-making process. Not only is it essential for the data to be up-to-date, it should provide more than a snapshot of current local specificities, it should also provide indications of trends over the short and longer timescales and be benchmarked against other regions. Analysis should also reflect different interests and their agendas: the individual, the firm and the region.

The Oxfordshire Economic Observatory (OEO) was established to undertake world-class research providing data and analysis first to major stakeholders in the Oxfordshire region and second to broader communities – at regional, national and international scales. OEO is an independent research centre, based both in the School of Geography, Oxford University and the Department of Planning, Oxford Brookes University. It provides up-to-date information and analysis on economic trends primarily on the Oxfordshire and London economies, benchmarked against regions in the UK, Europe and similar regions in the USA. OEO is an exemplar of a university-based research centre that is located at the nexus of academic, business and government interests – the triple-helix model (Etzkowitz and Leyesdorff 1997).

This paper develops three themes. The first is the process of developing the Observatory, organizationally. The second is the research portfolio of OEO. The third is how the findings are being utilized for regional development purposes within the

UK's South East, and highlights the relevance of OEO to regions in developing countries.

2. WHAT IS OEO? DEVELOPING THE OBSERVATORY

The observatory in its five year history has undergone three stages.

Stage 1 Identification of the need for the Observatory.

The Observatory's origins are in the research conducted by this author over three decades, beginning with my doctoral thesis at Oxford University, School of Geography begun in 1984. The research was immediately high-profile, taking shape at around the time of the publication of *The Cambridge Phenomenon: The Growth of a University Town* published in 1985 by Cambridge-based consultants Segal Quince & Partners. Although this work has been academic, it has always had support from external agencies. In particular it was funded by a local charitable trust, The Oxford Trust, established in 1985 to support science and technology enterprise by the founder of Oxford Instruments, one of Oxfordshire's most successful high-tech firms. From the beginning it had the support of Oxfordshire County Council and Oxford City Council. Hence it has always been embedded in the local system of governance.

The Observatory came to be established following a chance remark in 2000 about the need for my academic work on Oxfordshire's high-tech economy to be institutionalised within Oxford University. The intention was that funding would be raised to ensure that research would be continuous rather than piecemeal and being located within Oxford University would provide an authoritative position from which to address a wide range of audiences. It was in discussions with the then economic development officer of the County Council that it was decided that the research centre should draw on the complementary strengths of academics in Oxford's other university – Oxford Brookes. Colleagues there were experts in planning, transport and high-tech economies in other parts of the South East. At that time, the comprehensive database I had established for my thesis on Oxfordshire's high-tech economy was out of date because there was no one organisation responsible for collecting the data – unlike in Cambridge where Cambridgeshire County Council's statistician, Jill

Tuffnell, has maintained a high-tech database for over two decades. As in Cambridge, the Oxfordshire high-tech economy had been growing rapidly since the mid-1980s thus presenting considerable challenges to the urban infrastructure (transport and housing) and was creating pressures within the labour market from skills shortages. The timing was therefore right for an Observatory. Moreover, the political agenda post-1997 with the election of the Labour Government prioritised universities' role in economic development in the 1998 White Paper *Our Competitive Future: Building the Knowledge-Driven Economy*; the region with the creation of the Regional Development Agencies (RDAs) in 1999 and clusters (White Paper on Business Clusters published in 2001).

OEO was founded in January 2001 and is now a three-way collaboration with Birkbeck College, Department of Management, University of London, where I am employed full time. The team comprises four top academics: Professor John Glasson (Oxford Brookes University) and myself – the two lead academics, plus a senior colleague from each departments. These four comprised the Management Board. This board was set up to determine strategy – research and funding and to engage with local stakeholders. OEO also had the services of two research assistants at Oxford Brookes, one of whom is responsible for maintaining the database. The division of responsibilities is that I manage OEO and am in charge of the research strategy and research management. Professor Glasson is responsible for the database management, and the seminar programme. Professor Glasson and I work very closely, meeting frequently to discuss OEO's overall direction and co-author both OEO reports and academic papers.

It was agreed at the outset that the focus should be the high-tech economy, building on our expertise and using our limited resources, with the intention of expanding the portfolio of activities to encompass trends in the Oxfordshire economy as a whole. Initial funding, of around £30,000 came from The Oxford Trust, Oxfordshire's County Council and the district councils.

As a key element in OEO's mission to engage with local and regional stakeholders, an Advisory Council (which meets now annually) was established. The Advisory Council comprises representatives from major local and regional organisations. These

include the regional and local public authorities, key local entrepreneurs such as the founders of Oxford Instruments and Research Machines, the head of The Oxford Trust, politicians (an MP and the Leader of one of the district councils) and representatives from Oxford University: the Chief Executive of Isis Innovation, the university's technology transfer company, the Head of Regional Liaison and the Director of the Science Enterprise Centre, OxSEC. Other senior academics include the Head of the Said Business School and the Head of the Rutherford Appleton laboratory, one of the UK's major scientific research laboratories. A subset of the Advisory Council now forms the Strategy Group which meets three times a year and discusses research agendas. The ways in which these stakeholders have influenced the shape of data collection and what kinds of data has been useful to policy makers is discussed in the following sections.

Stage 2 developing the research agenda: What is OEO's research portfolio?

At the outset, eight core themes were decided and which remain OEO's research portfolio as they reflect both the major priorities within the Oxfordshire economy and Oxfordshire's position within broader economic and political contexts. It was also agreed that outputs would take three forms: (i) high profile reports, (ii) briefing papers and (iii) seminars and other speaking engagements. The eight core themes, outputs and funding are next discussed, along with other developments. These are to be found on the OEO website <http://o eo.geog.ox.ac.uk>.

Early funding for OEO's research activities came from the initial and follow-on general funding and from funding for particular research projects. A major impetus to OEO's activities was the award of funding from the UK Government's Higher Education Funding Council for England (HEFCE) (which operates under the jurisdiction of the Department for Education and Skills). In 2004, Oxford University and Oxford Brookes were awarded £38,823 to fund OEO for two years. The funding maintains OEO's high quality research activities, funds workshops for public authorities and local businesses at which economic intelligence on the evolving economy is disseminated, and is used to develop the website.

The eight research themes and their outputs are:

(i) Creation and development of a database of enterprise in Oxfordshire (ii) benchmarking Oxfordshire

The database, the core activity of OEO catalogues enterprise births, deaths, mergers, acquisitions and employment change, by sector and technology. The database provides the platform for investigations across the spectrum of the high-tech economy. International comparisons, which are essential to understanding processes of entrepreneurship, technological advance and economic development in Oxfordshire, are made using information in the database.

- In 2003 OEO produced a two volume report: “*Enterprising Oxford: the growth and anatomy of the Oxfordshire high-tech economy*”. *Enterprising Oxford* was launched by the UK’s Minister of Science, Lord Sainsbury, in March 2003 at the Royal Society.

This professionally published, bound report explained how the Oxfordshire's high-tech economy is now one of the largest and fastest growing in the UK, with an estimated 1,400 high-tech businesses currently located in the county. These companies have a combined workforce of over 36,000 and most have been formed during the last decade. Along with the neighbouring counties of Berkshire and Buckinghamshire, Oxfordshire forms part of one of the highest concentrations of high-tech employment in Europe. Although the companies operating within this sector are mainly small companies, nevertheless it is the larger firms that account for the bulk of the high-tech jobs. The county is the highest-ranked EU region for high-tech services, and is the fastest growing high-tech region in the UK.

Volume 1 records how Oxfordshire’s high tech economy grew within an old economy dominated by the manufacture of automobiles, blankets and food. It highlights the actions of key individuals who had set the agenda and were instrumental in bringing about change, the changing roles and fortunes of the universities and the county’s seven government laboratories, the county’s most successful enterprises, the networks of supportive organisations, the planning system and key planning decisions. The Report also looks to the future. The Report argues that it is a particular concern that there should be more support for skills development to enable the region to continue

to develop the economy at an optimum rate. Problems and issues of sustainability and the environment are also highlighted.

Volume 2 provides a complete breakdown of the database and benchmarked Oxfordshire against other UK and European regions. It begins by defining high-tech and discusses various definitions such as used by the OECD and Eurostat. The definitional issue is crucial to establishing the extent of particular kinds of activity, hence the design of policies to support or ameliorate particular problems associated with growth/decline. For example, using a broad definition of high-tech (Eurostat), Oxfordshire would have 2000 high-tech firms employing 50,000 people but this would include the production of the Mini (BMW) and other automobile related production such as component manufacture. The definition used by OEO is a narrow Butchart + definition based on the 1987 Butchart definition developed for the UK's Department of Trade and Industry (DTI) which defined high-tech sectors on the basis of the R&D intensity. The report benchmarks Oxfordshire's high-tech employment against regional and national averages, and makes comparisons with other English counties and competitor European regions. Recent trends in high-tech employment levels in the county are also analysed. The data on the high-tech economy has been the most useful to all the stakeholders. There is a continual demand for robust data. OEO data has been widely cited in policy documents and in presentations by all of the stakeholder organisations, often abroad. It appears on the websites for example of OxSEC, The Oxford Trust, OEP and Oxford University and Oxford Brookes main pages. The reports were also cited in HM Treasury's 2003 *Lambert Review of Business and University Collaboration* (The Lambert Report). Until report on the database, the growing extent of Oxfordshire's high-tech economy was not documented. It now accounts for some 12 per cent of the county's workforce. Leading sectors include biotechnology, ICT and engineering.

- The database is currently being updated. The new data will be published in *Enterprising Oxford (III)* in December 2006.

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(iii) *Employment: supply and demand:*

What is the changing mix of labour by skill, age, gender and education? How is the nature of work in different sections of the high-tech economy changing? What will be the future of work?

The academic argument is that clustering of innovative industry both demands and creates a local highly-skilled labour market. The growth of agglomerations of labour has been argued to benefit both individuals and firms by providing the opportunity for matching labour demand with labour supply, which is crucial to sustaining innovation. Additionally, mobility within the local labour market is argued to be of collective benefit as the movement of the highly-skilled within the cluster is a key mechanism for technology transfer and fostering of inter-firm links. Social networks (social capital) are argued in the literature to be the medium by which these activities are facilitated and their development key to innovation-based local economic development. This is exemplified by Silicon Valley (Saxenian 1994, Benner 2003).

OEO has undertaken two studies of labour markets and is about to conduct a more extensive study which will examine the supply side of the Oxfordshire labour market.

- Milton Keynes, Oxfordshire and Buckinghamshire Learning and Skills Council (April 2002-August 2002) 'The labour market potential of over 50s Scientists and Engineers in the MKOB region'.
- Technicians: Planning for the next generation of skills' The Oxford Trust/Oxford2Cambridge Arc (January to August 2004)

The first established the extent of scientists and engineers aged 50+ in Oxfordshire's universities, government laboratories and large high-tech firms who might be recruited into the high-tech economy to overcome skill shortages. This is in the context of considerable downsizing in the late 1990s in the laboratories combined with an increasing age profile in the laboratories and the universities. Early retirement reduces the skill base of the county. The policy implication of this research is that there is the opportunity to establish a mentoring network that would advise younger

entrepreneurs, providing advice on scientific projects and management and/or a science and engineering consultancy network whereby smaller firms could draw on this pool of expertise.

The second addressed the changing labour market for technicians and explored whether Oxfordshire's training institutions have established an appropriate strategy to address new career paths. Technicians traditionally had "jobs for life", but now technicians who have only ever worked for one or two employers constitute a dying breed. The trend is increasingly for short-term contracts, or rapid turnover within jobs, such that the average tenure of jobs is less than 5 years. As a result, people need to be more adaptable with the skills they have, and be prepared to acquire new skills to respond to the changing labour market needs. There is a need for a platform of generic skills (i.e. transferable skills that can be used across occupational groups), on which to build a range of more technical and job specific skills. The recommendation of this study was that there should be far greater cooperation between training providers in the county.

The third study will be undertaken in conjunction with the County Council and OEP. This will contribute to the Oxfordshire Learning Partnership's Learning Plan. Following consultation with the Learning & Skills Council and the County Council, OEO proposes that the key questions for Oxfordshire are:

1. does Oxfordshire provide the right kinds of skills to attract and retain firms in key sectors such as engineering and IT?
2. are the channels of communication sufficiently well developed to match supply with demand?

The objectives of the proposed study are therefore:

1. to identify the current patterns in the employability of human capital in key sectors of the Oxfordshire economy's 16+ sector of the workforce.
2. to suggest policy implications emerging from the patterns identified by this study at the local and regional level.

(iv) ***Evaluating the significance of clusters for technological development:*** How does clustering of activity contribute to technological change in established and emerging technologies? How does Oxfordshire compare with other regions as a pioneer region?

The justification for this focus is that geographic clustering of high-tech firms is associated with rapid innovation-led economic development. Proximity is argued to increase information flow and rate at which innovations diffuse – the ‘innovative milieu’ concept (Camagni 1991) and Porter’s (1998) cluster thesis. In this line of argument, the innovative firm creates and uses networks and interdependencies which allow companies to innovate more quickly and to develop innovations that are beyond their individual capabilities (Rutten and Boekma 2004). Indeed many studies have shown that regional innovation intensity and technology transfer as measured by inter-firm cooperation is positively and significantly related to innovation success (Love and Roper 2001, Frenz and Oughton 2005). Thus the interest to The Oxford Trust and local and regional policy makers is in the overall extent of clustering of high-tech activity and in which sectors and how networks can be improved.

These issues formed a central theme of *Enterprising Oxford*. In addition to the report, The Government Office of the South East commissioned OEO in January 2004 to undertake ‘The Oxfordshire Case Study’. This was a further breakdown of trends within the Oxfordshire high-tech economy.

A current OEO project is focusing on the R&D activities of multi-national companies in Oxfordshire. This is part of an eight country comparison funded by the European Commission. The first task is to establish who owns Oxfordshire. The second task will be to consider the implications of technology transfer networks of these companies – and whether the universities and the county can provide a better environment than which currently exists.

- Locomotive ‘Dissemination of knowledge concerning current R&D localisation of large regionally important private sector organisations (European Commission Sixth Framework Priority Programme) (January 2006-)

(v) *Mapping university/national laboratory interaction*

What is the true extent of university-industry and national laboratory-industry interaction within the county? How does this compare with industry and science base links in the most successful cases?

This theme reflects UK and European Union concerns about the low levels of innovation in the economy. The argument is that knowledge-based economies are innovation driven: there is a widespread agreement that knowledge, technological innovation and industrial competitiveness are linked (Oughton et al 2002). In the context of concerns in countries such as the UK that economic performance is held back by a lack of innovation, universities have assumed a central role in the delivery of policies designed to drive economic development. Universities, as producers of knowledge are a resource that can be used by firms to close to universities. Moreover, governments throughout the world have instituted incentives for universities, their staff and students to be more entrepreneurial and contribute directly through economic development through business activities such as the formation of spin-off companies, patenting and licensing technology (see Etzkowitz et al 2000). Universities are also increasing participating in local and regional governance structures.

OEO's contribution to the debate about universities' and government laboratories' contribution to innovation and economic development is twofold. The first is a chapter in *Enterprising Oxford Volume 1* that explores the technology transfer activities of Oxfordshire' academic and research institutions and the development of partnerships in innovation.

The second is the form of a study:

- Measuring the performance of Oxfordshire's academic spin-offs (2004/2005)

The findings of this study were published in December 2005 in the Report *Public Research High-Tech spin-offs: measuring performance and growth*. This Report, another report professionally produced, was launched to an invited high-level audience of 200 people from academia, business and policy-makers at the Said Business School in December 2005.

The study found that 114 spin-offs originated in Oxfordshire's three universities and seven research laboratories employing 9,500 people (3.5 percent of the County's workforce). The largest sectors were biomedical sciences and information and

communication technologies. 12 companies have been launched on stock exchanges. These include Oxford Instruments, Research Machines, Psion, Powderject (now part of Chiron and Medisense). The study also shows that it takes on average ten years before firms start to grow to any substantial size – generating significant employment. Unlike other studies of spin-offs, it records spin-offs dating back to the 1950s and records patterns of growth. The findings on growth trajectories have implications across the county, for example for future housing and dedicated property developments.

This study had considerable input from Isis Innovation. The results of the study have been used widely within Oxford University, to demonstrate its success in spinning off new firms. The national importance of this study is indicated by the report being featured on the UK government's eGov website, under the heading, '[Excellence in new venture creation: the Oxfordshire model](#)'.

A further study, this time of London University spin-offs is scheduled and will be funded by London Higher, which represents the 42 London University colleges:

- Measuring the performance of London University spin-offs

(vi) Infrastructure and policy networks

A key task of the Observatory is the periodic assessment of the effectiveness of the policy system as it evolves, in terms of Oxfordshire's ability to sustain its position as a leading centre of innovation. What is Oxfordshire doing to ensure that its economy is sustained by world class hard and soft infrastructure?

These issues have been addressed in the form of seminars organised in conjunction with the County Council. Attendees are from business, local and regional government and academia.

Stage 3 Broadening OEO's portfolio

The maturing role of OEO is indicated by the scope of work on the seventh of the key themes.

(vii) The Oxfordshire economy

What is the impact of the growth of the high-tech sector on the demand for products and services in the local area? What are the connections between the high-tech sector and other major industries such as the car industry? What are the impacts of global competition on these industries? What is the role of exports in driving the local economy?

Five briefing papers, produced quarterly, have been prepared on trends in the Oxfordshire economy. These provide up-to-the-minute analysis of recent trends across the Oxfordshire economy as a whole. The content of the reports includes information on labour market trends and in the performance of the economy. The reports are first presented to the meetings of the Oxfordshire Economic Partnership, 'a network of public and private sector partners committed building a world-class economy in Oxfordshire'. Economic partnerships are mandatory in the UK, and are designed to bring together major local interests with the purpose of conducting constructive policy-making dialogues. The reports are then published on line on the website.

(viii) Urban structure and the new economy

What is the interaction between the organisation of the built environment and the development of the new economy? How is this related to changes in the regional, national and international economy?

This topic was also featured in *Enterprising Oxford*, in the Briefing Reports, and forms part of the current portfolio of work at the Oxford Brookes arm of OEO.

Alongside these reports, the team publishes academic articles on the studies. These include:

- Universities, Innovation and territorial development: A review of the evidence
Environment and Planning C (Forthcoming)

- Lawton Smith, H and Ho, K W ,Measuring the performance of Oxfordshire’s spin-off companies’ *Research Policy* (August/September 2006)
- Glasson, J, Chadwick, A and Lawton Smith, H ‘The growth of Oxfordshire’s high-tech economy’ *European Planning Studies* (In press April 2006)
- Lawton Smith, H, Glasson, J, and Chadwick, A , (2005) The geography of talent: entrepreneurship and local economic development in Oxfordshire’ *Entrepreneurship and Regional Development* 17, 449-476

3. OEO’S REGIONAL ROLE AND RELEVANCE TO DEVELOPING COUNTRIES

The OEO model is one which engages with a wide range of local, regional and organisations. Its research agenda and dissemination strategy are an essential part of policy-making activities within political, economic, academic and scientific spheres of interest. The relevance of the OEO model to developing countries is fivefold.

The first, and by far the most important, is the need to create a database of activity, maintain it and provide analysis of the data with a view to identifying trends and their potential consequences. This provides a sound basis for policy-making and business decisions.

The second is that embedded engagement with stakeholders is crucial. OEO demonstrates that collaboration between local universities and with key local partners – in both public and private sectors - is the best model. Collaboration increases efficiency and provides legitimacy for the research agenda, locally, regionally and nationally. OEO is directly involved in the main policy-making bodies and vice versa. OEO is represented on the board of OEP (and vice-versa), on the Executive Committee of the Oxfordshire County Community Data Observatory (an observatory of observatories) for which it is the economic intelligence provider, and the Steering Committee of The Oxford Trust Networks activity (which undertakes sector studies). It is therefore embedded in local systems of governance. Moreover, OEO is unique in

that it through its Advisory Council, it brings together politicians with local development officers as well as business people.

At the same time, it is an outward looking model. As with cluster development and technology transfer networks, the key to innovation is for firms is to link up with global flows of knowledge (Malmberg and Power 2004). This equally applies to policy-making. This model therefore shows that academics can play a fundamentally crucial role in policy-making through their data-collection and analytical skills and their key local as well as global knowledge. Far too often in the UK, expensive consultants are paid to undertake reviews of local trends and who very often have no local knowledge, hence take time to get up to speed with local issues.

Third, well presented and frequent output is essential. OEO's publications and seminars serve the following purposes: (i) to provide independent analysis on key trends in the economy which are relevant to the needs of policy makers, industrialists looking to locate in the region, service providers and venture capitalists looking for business opportunities and so on and (ii) to raise the profile of the region. *Enterprising Oxford* has been widely circulated at the highest levels of government and by Oxfordshire's local government agencies, The Oxford Trust and so on as evidence of Oxfordshire's role in the international economy. Both *Enterprising Oxford* and *Public Research High-Tech spin-offs: measuring performance and growth* are given to visitors from around the world by all of Oxford University's technology transfer departments to publicise the University's success as an entrepreneurial university. Part of that dissemination strategy is OEO's high quality website. This is maintained within Oxford University's School of Geography. It has pages on news, research output, events, key staff, the Advisory Council and our sponsors.

Fourth, it is important to have the right mix of skills and good working relationships between the key players. OEO's management team comprises economic geographers and planners, all of whom are expert in undertaking detailed analyses of economic development at the regional level, but from different perspectives. These complementary assets, for example in understanding locational factors relating to high-tech industry, regional systems of innovation, technology transfer, factors influencing the formation and growth of firms, labour market dynamics, planning

issues relating to urban structures and transport, underpin OEO's capacity to identify the nature of specific issues, develop methodologies for addressing their causes and produce conclusions that are relevant to the needs of local stakeholders. In addition, the research assistant in charge of the database is a statistician by training. He compiles the database from a wide range of local, national and international sources such as local newspapers, databases held by other local organisations and data produced by Companies House, the Office of National Statistics and Eurostat.

OEO also draws on research assistance from within the respective universities. For example, the data collection and analysis on the Oxfordshire spin-offs study was first undertaken by a fourth year engineering, economics and management undergraduate at Oxford University. This formed the content of his final year dissertation at the Said Business School. His placement was for six months. Follow-up work has been conducted by a Masters student at Birkbeck. This student will undertake the data collection and analysis on the London Spin-offs project. Other students will be employed on future projects, such as the labour market study.

Fifth, observatories of this kind need to be funded by central sources as well as through competitive bidding. Long-term funding (three years minimum) allows freedom to plan activities and lead the research agenda, rather than being dependent on short-term projects.

4. CONCLUSIONS

Local observatories such as OEO can improve local policy making by delivering relevant information and analysis at a relatively low cost. Unlike consultancy companies, academic research centres such as OEO are established out of the long-term interests and passions of their founders. A principal advantage of such a model is that its management team build up long-term relationships with local stakeholders in both the public and private sectors. Through these relationships a dialogue is maintained about the key issues, the questions that need to be addressed and the methodologies for developing the analysis and the means of dissemination. The reciprocal benefits are that national, regional and local governments obtain theoretically informed analyses and data on priority topics while academics get to

publish on contemporary issues, fulfilling a broad rather than narrow academic function. The independence of academics is crucial in this role.

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