



Understanding the innovative entrepreneur: what the literature doesn't tell us

**Delta Economics
Working Paper**

Why we need to link innovation and entrepreneurship

Introducing the innovative entrepreneur

Take a good idea and think it through. Where has it come from? Was it truly “yours” or did it come from that third glass of wine you drank last night? Was it something that has been at the back of your mind since you were at university? Or was it the result of experience: maybe what you wanted in the market wasn't there; maybe the way you have been going about your daily life for years no longer works either for you or for others around you. How many other people have thought the same thing?

Then think about the opportunities that the idea offers and the risks. How much will it cost? Where will the money come from? Will it be worth it for the financial, reputational, social or increasingly environmental return that you receive?

If it still seems worth pursuing, who will you need to help you? What makes your idea unique? How many other similar products (goods or services) are already out there? What do you need to do to turn it into something that will fly as a business proposition? How will you get the idea to market? Who will “buy” it? How will you grow the idea and make it sustainable? How will you reap the returns from the idea that you feel are commensurate with the risk you are taking?

If you have been through this process, the chances are that you are an “innovative entrepreneur”. Like 22% of all of the people in the UK who set up businesses in 2006¹, you have had an idea and you have tried to take it to market in the form of a new product, a new service or a new way of doing things. You've seen the opportunity and taken it. You've benefited materially although this may be in many different ways – financially, reputationally or, increasingly, in terms of the feeling that you have created an entity that has innovated and produced a societal return. It may even just be that someone at work or in your network has said, “Well done.” You may have set up a business to carry your idea forward or you may have changed things within your working environment.

But whatever else may be the case, something has changed as the result of your activity: you, the economy or society has measurably changed as a result. Through your activity, jobs have been created or consumers in new markets have been reached. Wealth, through income or jobs or improvement in welfare, has been created – you have contributed towards the country's productivity in a meaningful sense.

Why this matters

Quite apart from the individual “feel good” factor, there are very good reasons why policy makers across the

¹ Harding, R. (2006): “Global Entrepreneurship Monitor, UK. 2006” London Business School, London.

world are interested in this group of people, the “innovative entrepreneurs”. The United States economy grew rapidly during the 1990’s and its productivity gains have been attributed to systems and structures in the US that allowed technological developments in ICT to be commercialised.² In particular, access to knowledge networks (universities and large firm research and development), access to finance in the form of venture (or risk) capital and access to high level skills that allowed new knowledge to transfer between people and institutions and to be converted quickly into viable business propositions either within existing firms or, equally, in new business entities.

The result was, by the beginning of the 21st Century, a productivity gap between the UK and the US of 40%, and between the UK and France and Germany of 17% and 8% respectively. A large proportion of this was said to be attributable to the “intangible” aspects of productivity, like skills, innovation and enterprise.³ In other words, because the UK as a nation was not innovating quickly enough – that is, building on the research and knowledge base in the university and corporate sectors to create new ideas and new business entities – we were falling behind in terms of our capacity to create long term growth from within our economy.⁴

In summary:

- HM Treasury has identified the five drivers of UK productivity as investment, skills, innovation, enterprise and competition with a precondition for growth and employment being macroeconomic stability. It has set ambitious targets to measure performance against each for publicly funded bodies nationally, regionally and locally, in particular the Regional Development Agencies and local authorities are increasingly charged with delivering regeneration through innovation and entrepreneurship at the regional and local level respectively. Specific policy initiatives have included the ten year science and innovation strategy and associated investments to reach a target 2.5% of GDP spent on research and development (R&D), the Lambert Review of how to improve university–industry links in transferring technology and knowledge between the science base and industry, supply-side initiatives to improve access to finance for growth firms and demand side initiatives to improve networking, mentoring and support for entrepreneurs at the very early stages of start-up

² Jorgenson, D W and Stiroh, K J (2000), ‘Raising the speed limit: US economic growth in the information age’, mimeo; Oliner, S D and Sichel, D E (2000), ‘The resurgence of growth in the late 1990s: is information technology the story?’, *Journal of Economic Perspectives*. It should also be stressed that the exponential growth in entrepreneurial company valuations enabled by the expansion of the venture capital sector is also regarded in the literature as an important factor (Gompers, P. and Lerner, J (1997): “Venture capital and creation of public companies: do venture capitalists really bring more than money?” *Journal of Private Equity*, Fall, 1997, pp15-32 and Harding, R. (2000): “Venture capital and regional development” *Venture Capital* 2(4) pp287-311)

³ Porter, M. And Ketels, C. (2003): “UK Competitiveness: moving to the next stage”. *DTI Economics papers*, No. 3 (DTI/Pub 6580/5.5k/05/03/NP URN 03/899)

⁴ *Generation of economic growth from within the economy through the commercialisation of Research and Development, new technologies and innovations is termed “endogenous growth” and has been at the base of the Treasury’s economic thinking since 1997. For more information and a discussion see Harding, R. and Harding, D. (2007): “Global Competitiveness and Regional Advantage.” Report for the Business Without Borders, conference, June 2007. University of Bedfordshire Centre for Global Competitiveness. Endogenous growth theory has been a feature of evolutionary approaches to economics since Schumpeter’s work but its use as a model for economic management was developed by Aghion, P. and Howitt, P. (1998): “Endogenous Growth Theory” MIT Press, Cambridge, Massachusetts. See also Department for Trade and Industry (2003): “Competing in the Global Economy – the Innovation Challenge” DTI Economics Paper, No 7. HMSO, London, November 2003.*

activity.⁵

- The Lisbon Agenda of the European Union (2000 and reviewed in 2005) was similarly driven towards closing the innovation and entrepreneurship gap with the US in the interests of raising productivity. It set out its objectives that included achieve 3% GDP growth and 20 million jobs across the EU by 2010 allowing Europe to become the world's "most competitive region in the knowledge-based economy."⁶ One of the central pillars of the Lisbon Agenda was developing a strong and entrepreneurial start-up and SME sector within the EU as a precondition for generating jobs and innovation.⁷ Across various EU commissions, the goal was to increase levels of innovation, streamline support for small enterprises through better access to finance, reduced regulation and red tape and cheaper start up costs.

International evidence base

Alongside these initiatives there have been independent and government funded surveys to measure impact and improve the evidence base around the areas of innovation and entrepreneurship at a European and at a UK level. The Community Innovation Survey (CIS), for example, compares innovation in firms with more than ten employees in participating Member States⁸, while the Cambridge-MIT Centre for Competitiveness compares "innovative" firms in the UK and the US to see whether there are differences at a firm level⁹. The Confederation for British Industry (CBI)¹⁰ and the Engineering Employers' Federation (EEF) have similar surveys of members and The Work Foundation conducted two surveys to look at how innovation, amongst a raft of other strategic "intangibles" was managed and contributed to productivity across a random sample of UK firms.¹¹ Many of these are structured around the Organisation for Economic Cooperation and Development's (OECD) definitions of innovation and innovative firms, as discussed below.¹²

Other surveys have been constructed to understand the process behind entrepreneurship and the entrepreneurs that set up businesses. The DTI's Small Business Service Household Survey¹³ is designed to look at the demand side behind entrepreneurial activity by means of a telephone survey of randomly selected households in the UK. The EU runs its "Eurobarometer" survey to establish attitudes across the EU and beyond towards self employment.¹⁴ Similarly the Global Entrepreneurship Monitor (GEM) is an

⁵ For regular summaries of policy towards innovation and entrepreneurship see Harding, R (2002-2006): Global Entrepreneurship Monitor: UK report. London Business School, London.

⁶ <http://www.eu2005.gov.uk/servlet/Front?pagename=OpenMarket/Xcelerate/ShowPage&c=Page&cid=1114071804875>

⁷ http://ec.europa.eu/enterprise/enterprise_policy/charter/index_en.htm

⁸ DTI (2006): "Innovation in the UK: Indicators and Insights" Occasional Paper No 6, HMSO London.

⁹ Cambridge-MIT (2006): "UK PLC – Just How Innovative Are We? Findings from the Cambridge-MIT International Benchmarking Study" Cambridge-MIT, Cambridge, UK.

¹⁰ CBI (2005): "Innovation Survey 2005, Executive Summary." Confederation for British Industry. London

¹¹ Harding, R., Cowling, M. and Turner, N. (2003): "The Missing Link: From Productivity to Performance" and Bevan, S., Cowling, M., Horner, L. Isles, N. and Turner, N. (2005): "Cracking the Performance Code: How Firms Succeed." The Work Foundation, London.

¹² OECD (2005): "Oslo Manual" <http://www.oecd.org/dataoecd/35/61/2367580.pdf>

¹³ Small Business Survey (2003, and 2005): Household Survey of Entrepreneurship (<http://www.dti.gov.uk/files/file38261.pdf>) is designed to look at the demand side behind entrepreneurial activity by means of a telephone survey of randomly selected households in the UK.

¹⁴ European Commission (2004): "Entrepreneurship, Eurobarometer." Directorate General Enterprise, Brussels.

international telephone survey of a randomly selected sample of households in each participating nation (42 in 2006) to establish a comparative measure of entrepreneurial activity and to examine attitudes and motivations of entrepreneurs, to establish how many are innovative entrepreneurs and to look at the challenges, networks and barriers that they face. The OECD has its own project to develop rigorous internationally comparative indicators¹⁵ but this is still at an embryonic stage. These, amongst others, are the subject of further discussion later in the document.

No-one is looking specifically at the 'innovative entrepreneur'

What is intriguing about all the interest in “innovation” and “entrepreneurship” however, is that, in recent literature and policy discussions at least, they are rarely defined and even more rarely combined in the same unit of analysis.¹⁶ Policies aimed at entrepreneurship typically focus on the small business sector and, in the case of EU policy, on encouraging it to be more innovative. Alongside this, more people are encouraged to set up businesses. Similarly, innovation is viewed in terms of Science, Engineering and Technology (SET) and its commercialisation rather than in terms of the *entrepreneurial processes* driving that commercialisation. Increasing amounts spent on R&D or increasing the number of knowledge workers in the economy is seen as intrinsically a “good thing”.

This has little recourse to the broader definition of innovation as “change” and entrepreneurs as “the agency that generates changes in the rules and implements those changes”.¹⁷ Instead, innovation policy focuses on increasing the science base and putting mechanisms in place to enhance technology transfer (through funding and collaborative research) while enterprise policy focuses on increasing the numbers of businesses that are established. Both in the end are looking at “enterprises” as business entities, rather than the process of “enterprise” which is an activity associated with experimentation that changes the rules within which decisions are made and introduces “novelty” (new ways of thinking and new ways of doing) to the economy.¹⁸

The result is confusion in the literature and arguably in policy and practice in the UK and beyond. “Entrepreneurship” and “Innovation” are used in several ways:

1. Synonymously: entrepreneurs are necessarily bringing something new to the market and therefore are innovating.¹⁹

¹⁵ http://www.oecd.org/document/3/0,2340,en_2649_201185_35377795_1_1_1_1,00.html

¹⁶ One exception is in work by Folkerington, M., Meijaard, J., and van Stel, A. (2005): “Innovation, strategic renewal and its effects on small firm performance” Max Planck Institut für Wirtschaftsforschung, Jena, Discussion paper no 36. The authors link the knowledge networks and patenting process to small firm performance and growth but are not looking at entrepreneurial behaviours as such.

¹⁷ Metcalfe, S. (2006): “Entrepreneurship: an evolutionary perspective.” Pp 59-90 in Casson, M., Yeung, B., Basu, A., and Wadeson, N. (2006): “The Oxford Handbook of Entrepreneurship.” Oxford University Press, Oxford.

¹⁸ Metcalfe, S. (2006): *op cit*

¹⁹ Casson, M. et al (2006) argue that the literature has construed entrepreneurship “in terms of arbitrage, innovation and risk taking” and therefore, by inference make a contribution to economic growth. Casson, M., Yeung, B., Basu, A., and Wadeson, N. (2006): “The Oxford Handbook of Entrepreneurship.” Oxford University Press, Oxford. P 1

2. Interdependently: entrepreneurs are active in technology sectors and the small businesses they establish make a direct contribution to job creation and productivity.²⁰
3. Independently: entrepreneurs are defined by their decision making and risk taking capacity and not by the novelty of what they do. Innovators are defined by their novelty. It is therefore possible to be entrepreneurial without being innovative and vice versa.²¹

Aims and objectives

The aim of this interim research report is to clarify the definition of an “innovative entrepreneur” with a view to developing a robust survey methodology. The survey will isolate this particular group of entrepreneurs in the interests of understanding their characteristics, their networks and support structures, the sources of their ideas and the challenges they face. Ultimately the goal is to inform policy makers about this important group of economic actors by adding to the evidence base.

Within this, the report has a number of specific objectives:

- By means of a summary literature review to distinguish between levels and types of innovative entrepreneurship and, hence, to isolate SME-based Innovative Entrepreneurs that have the potential to create *paradigmatic* shifts in products and markets.
- By means of a matrix looking at the relationship between entrepreneurship and innovation, to define the impact on wealth creation and broader societal, cultural, technological and/or economic change.
- By means of a review of existing data sources to identify their methodological strengths and weaknesses and, hence, how they help us understand the innovation and entrepreneurial process generally and “SME-based Innovative Entrepreneurs” in particular.
- By means of a brief statistical summary of the GEM UK data to highlight some of the characteristics of innovative entrepreneurs.
- By means of a summary of the analysis, to draw out research questions and methodological issues that should underpin any survey working undertaken in a second stage of this research.

There are a number of ideas that are developed in subsequent sections which inform the approach and which are helpful to lay out from the outset.

First, although there may be a tendency to use “entrepreneurship” and “innovation” interchangeably, the

²⁰ Armington, C. and Acs, Z. (2004): “Job Creation and Persistence in Services and Manufacturing” *Max Planck Institute for the Study of Society, Jena, Working Paper 16-2004*.

²¹ See, for example, Hayek, F.von (1937): “Economics and Knowledge.” *Economica New Series, issue 4 pp 33-54* or Kirzner, I. (1973): “Competition and Entrepreneurship” *University of Chicago Press, Chicago*. For these economists the entrepreneur conducts activity essentially centred around arbitrage and price setting as means to trade while the innovator brings new products or processes to market.

two are quite distinct phenomena. The “entrepreneur” perceives opportunities and makes judgement calls as to the market viability (i.e. the risks) of those opportunities²². The innovator is the source of those ideas and opportunities and is the conduit of knowledge between the knowledge-base and its future commercialisation, effectively converting uncertainty, which cannot be calculated into risk, which can.²³ While the literature from 50 years ago or more was clear on this distinction, the boundaries between the two have become blurred in recent writing and thinking. This is the focus of the first section of the report that overviews the literature and attempts to re-synthesise the two literatures. It culminates in a workable definition of the “innovative entrepreneur” as a person who identifies an opportunity from an innovation, whether social or commercial, evaluates its market potential based on their own knowledge networks and social, financial or educational capital, and establishes an organisational structure, either within an existing entity or by creating a new one, that allows that innovation to be developed.

Second, there is a spectrum of innovative entrepreneurship from low levels of entrepreneurship (arbitrage and price setting) and incremental innovation through to high end entrepreneurship where new industries, ways of working and cultures are creating paradigm shifting innovations.²⁴ The impact on the economy of innovative entrepreneurship will vary correspondingly from relatively small scale job creation through to complete changes in the way that society and the economy work. This is developed into a matrix structure in the second section of the report.

Third, innovative entrepreneurship is neither limited to the small firm sector nor is it a phenomenon which occurs in isolation. This is important to place the SME-based Innovative Entrepreneur in its wider context in order to more fully understand how their specific characteristics are distinctly different. Within large organisations the innovative entrepreneur can be seen as a “Change Agent”²⁵ who presents a particular set of management challenges because of their disruptive characteristics. Innovative entrepreneurs are similarly change agents in markets, industries and broader society. Innovative entrepreneurs in either setting do not act alone. Indeed, they and the success of their “enterprise” (as defined above) are *symbiotically*²⁶ dependent on the competitiveness ecosystem around them. This ecosystem is essentially the source of “entrepreneurial capital”²⁷ which, in turn, is determined by access to various forms of capital including finance, knowledge, human and social. Without this “entrepreneurial capital”, any growth and sustainability of innovative entrepreneurship is restricted.

Fourth, while policy and the evidence base understand in principle the need to link innovative

²² Casson, M. (1982): “The Entrepreneur: An Economic Theory” *Martin Robertson, Oxford.*

²³ Tidd, J., Bessant, J. and Pavitt, K. (2007): “Managing Innovation: the integration of technology, markets and organisational change.” *John Wiley, Chichester*


²⁴ Freeman, C. and Louca, F. (2001): “As Time Goes By: from the industrial revolution to the information revolution.” *Oxford University Press, Oxford.*

²⁵ Buchanan and Boddy (1992): “The Expertise of the Change Agent: public performance and backstage activity” *Prentice Hall, Hemel Hempstead.*

See also Tushman, M. and O’Reilly, C. (1997): “Winning through Innovation: a practical guide to leading organisational change and renewal.” *Harvard University Press, Cambridge, Mass.*

²⁶ Harding, R. (2001): “Competition and Collaboration in German R&D” *Industry and Corporate Change Vol 10, No. 2 pp389-417. June 2001, Oxford, OUP*

²⁷ Audretsch, D., Keilbach, M. and Lehmann, E. (2006): “Entrepreneurship and Economic Growth” *Oxford University Press, Oxford*



entrepreneurship and the competitiveness ecosystem around them, the precise mechanisms by which these entrepreneurs themselves pick up ideas, opportunities, support, tangible assets (such as capital and skills) and intangible assets (such as know-how and social capital) and develop experience and *learning* over time is less well understood. This is for two reasons: first, because the intangible nature of the interdependency rests in aspects of the social and cultural environment which are inherently hard to measure except by proxy and second because the innovative entrepreneurs, both within firms and outside of them, are difficult to survey on a random and unbiased basis.

The final part of the report looks at the methodological issues that are raised by the above discussion. It suggests that surveys of firms are limited in their usefulness for understanding the innovative entrepreneur, while broader adult population surveys which can identify entrepreneurial activity can only identify innovative entrepreneurs as a subset of all entrepreneurial activity. Howsoever large the initial sample size maybe, and in GEM UK's case it is 43,000, this still ends up with a small and statistically unreliable sample of innovative entrepreneurs. Further, because of the generic questionnaire that such a random adult population survey must use, the extent to which it can really understand the interdependencies of this group of entrepreneurs with other entrepreneurs, other businesses and other aspects of their ecosystem is limited.

The survey methodology for the next phase, therefore, should ensure that it is surveying innovative entrepreneurs themselves and not the managers of the enterprises within which they work or that they have established. Its principle interest will be in understanding the characteristics of the innovative entrepreneurs who have the potential to create paradigmatic changes and therefore should be focusing on interviewing the founders themselves. This poses a number of sampling issues which are discussed but which are not insurmountable.

What is innovative entrepreneurship?

While technology, innovation and knowledge and their long term impact on economic growth is well understood²⁸, and while entrepreneurs are known to be a critical part of that process²⁹ the two literatures have focused on different aspects of economic change.

The former has focused on understanding and measuring innovation as a process of change and, hence, how companies, countries and economic systems adapt to or assimilate that process of change. For these authors, the most important resource for any economy is knowledge and the most important process is learning and the steady accumulation of intangible knowledge assets and cumulative competencies.³⁰ Knowledge transfer is critical to the process of learning and the relative efficiencies of national systems can therefore be measured in terms of knowledge outputs such as patents, citations, strategic alliances, knowledge workers and so on.³¹ Differences in outputs as measured can be explained in terms of the intrinsic differences between Capitalist “systems” – those with more rigid labour markets such as the Rhineland system likely to produce “incremental innovations” while those with more flexible labour markets, such as the Anglo-Saxon system, more likely to produce “radical” innovations.³²

The latter literature has tended to focus on understanding entrepreneurs themselves – how they make their decisions, allocate resources, calculate risks and access finance on the supply side³³ and, on the demand side, how their ideas originate and the importance of social capital in the development of entrepreneurial networks and clusters at a regional level.³⁴ Only recently has there been an attempt to integrate a theory of entrepreneurship into a theory of economic growth³⁵ and although the intellectual heritage of this work is in

²⁸ See for example, Fagerberg, J. (1987): “A Technology Gap Approach to Why Growth Rates Differ.” *Research Policy* Vol 16. Elsevier, New Holland Amsterdam or Romer, P (1990): “Endogenous Technological Change.” *Journal of Political Economy* Vol 98 pp 71-102. See also Bergheim, S. and Hofmann, J. (2005): “Globale Wachstumszentren 2020: fundierte Langfristprognosen mid Hilfe von Formel-G”. *Deutsche Bank Research*, April; www.db.com and Freeman, C. and Louca, F. (2001) “As Time Goes By: from the industrial revolution to the information revolution.” *Oxford University Press*, Oxford

²⁹ This understanding goes back to Schumpeter, J. (1939): “Business Cycles.” *Harvard University: a theoretical, historical and statistical analysis of the Capitalist process.* McGraw Hill, London. Reflecting the uncertainty at the time as to whether innovation was exogenous (i.e. external to the market system) or endogenous (i.e. generated from within the system) he argued that the effect of entrepreneurship is to create new products, processes, export markets, sources of raw materials or organisational structures.

³⁰ Nelson, R. and Winter, R. (1982): “An Evolutionary Theory of Economic Change.” *Bellknapp Press*, Cambridge, Mass. See also, Lundvall, B.A (1992): “National Systems of Innovation: towards a theory of innovation and interactive learning.” *Pinter*, London. Harding, R. (2007): “The Unmovable Elephant: Germany and the UK’s productivity performance compared.” *German Politics*, Vol 16, No. 1 pp 137-149. *Taylor and Francis*, London

³¹ Furman, J., Porter, M., and Stern, S. (2002): “The Determinants of National Innovative Capacity” *Research Policy* 31, 899-933. Elsevier, New Holland. See also Kitson, M., Martin, R. and Tyler, P. (2004): “Regional Competitiveness: An Elusive yet Key Concept?” *Regional Studies* Vol 38, No 9 pp991-1000; Malecki, E. (2004): “Jockeying for Position: What it Means and Why it Matters to Regional Development Policy when Places Compete.” *Regional Studies*, Vol 38, No 9, pp 1101-1120, Carfax, London. Cooke, P. (2007): “To Construct Regional Advantage from Innovation Systems, first Build Policy Platforms.” *European Planning Studies* 15 (2): 179-194

³² Hall, P. and Soskice, D. Eds. (2001): “An Introduction to Varieties of Capitalism.” Chapter 1 in “Varieties of Capitalism: The Institutional Foundations of Comparative Advantage.”

³³ Casson, M. (1982) *op cit.*, Blaug, M. (2002): “Entrepreneurship Before and After Schumpeter.” Chapter 2 in Swedberg, R. (2002): “Entrepreneurship: the Social Science view.” *Oxford University Press, Oxford Management Readers*, Oxford. Reynolds, P., Bosma, N. and Autio, E. (2005): “The Global Entrepreneurship Monitor: Data Collection, Design and Implementation, 1998-2003.” In *Small Business Economics* vol 24 (3) 205-231.

³⁴ See Saxenian, A. (1996): “Regional Advantage: Culture and competition in Silicon Valley and Route 128.” *Harvard University Press*, Cambridge, Mass. Iyer, S., Kitson, M. and Toh, B. (2005): “Social Capital, Economic Growth and Regional Development.” *Regional Studies*, 39 (8): pp1015-1040, Nov 2005 or Beugelsdijk, S. and van Schaik, T. (2005): “Differences in Social Capital between 54 Western European Regions.” *Regional Studies* 39 (8): pp1053-1064; Beugelsdijk, S. (2007): “Entrepreneurial Culture, Regional Innovativeness and Economic Growth.” *Journal of Evolutionary Economics*, 17 (2): pp187-210.

³⁵ Audretsch, D., Keilbach, M. and Lehmann, E. (2006): *op cit*

the innovation literature cited above, it uses “enterprises” (i.e. start up rates) rather than enterprising activity as its proxy for measuring the amount of activity that is going on and uses established smaller firms to estimate relative investments in and production of knowledge or the impact of policy on start-up behaviours.³⁶

Yet the key issue for both literatures is they are dealing with change and the process of change. Tidd et al summarise the role of innovation in change as follows: “innovation is essentially about change – in the thing itself or in the way in which it is delivered.” They go on to argue that the degree of novelty determines the extent to which the innovation is a minor, or incremental, change or a major, or radical change.³⁷ To further understand the whole spectrum of change that innovation produces, they use the following definitions which are derived from Freeman’s seminal work on innovation³⁸:

1. *Incremental change*: These are the bread and butter changes in innovation that occur on a day-to-day basis. They involve small improvements in processes or products or services that do not profoundly affect the overall production process. The introduction of anti-lock braking systems into cars may be seen as an incremental innovation.
2. *Radical change*: These are discontinuous “leaps” in the product or the process that fundamentally alter a good or service is delivered or the way in which it is delivered. The introduction of a radical innovation has knock-on effects throughout a particular industry or sector. Freeman uses nylon, or float glass and one could add i-pods are entirely new products and as examples of radical innovations.
3. *New technology system*: These changes will alter several industries through the networks and supply chains of organisations in which the innovation originated since they are organisational as well and process or product innovations. For example, companies like Zara, whose lean production system built around a network of designers who work to short production cycles has transformed the way in which suppliers to Zara work, but also the way in which the whole clothing sector operates.
4. *Shift in techno economic paradigm*: This is a major shift, usually in technology, that alters the whole economy. An example would be the microchip which spawned a series of radical innovations in the 1980s followed by organisational changes that could be deemed a changed technology system in the 1990s and has created rapid productivity growth and a communications revolution that has altered the way in which the economy, services, work and even our domestic lives are organised and, indeed, the way in which we think about those things.

³⁶ Acs, Z. (2006): “Start-ups and Entry Barriers: Small and Medium-Sized Firms Population Dynamics.” Or Storey, D., “Evaluating SME Policies and Programmes - Technical and Political Dimensions.” Chapters 8 and 10 respectively in Casson, M., Yeung, B., Basu, A., and Wadeson, N. (2006): “The Oxford Handbook of Entrepreneurship.” Oxford University Press, Oxford. See also, Stam, E., van Stel, A., Suddle, K., and Hessels, J. (2007): “High growth entrepreneurship, public policies and economic growth” Max Planck Institut für Wirtschaftsforschung u. Universität Jena Discussion Paper. These authors argue that the greater ambition and growth potential exhibited by entrepreneurs, the greater the association with economic growth in a country.

³⁷ Tidd, J., Bessant, J. and Pavitt, K. (1997): *op cit*.

³⁸ Freeman, C. (1982): “The Economics of Industrial Innovation.” Second edition, Pinter, London. Freeman, C. and Perez, C. (1988): “Structural Crises of Adjustment: Business Cycles and Investment Behaviour.” In Dosi, G., Freeman, C., Nelson, R., Silverberg, G. and Soete, L. (1988): “Technological Change and Economic Theory.” Pinter, London. Freeman uses his own examples to illustrate the stages of innovation.

Yet these changes do not happen by themselves. They are driven by people in organisations, in universities and independent thinkers who see a problem – economic, social, technological or environmental – and want to fix it. As Baumol points out, “It seems to be taken for granted in the literature that, even if entrepreneurs are not in complete control of our economic destiny, they influence its direction as few, if any, others are able to do.”³⁹

Traditionally, economists regard entrepreneurs as market creators who are motivated by their own desire for, “wealth, power and prestige” as a reward for the risks that they take⁴⁰, but many who observe entrepreneurs argue that it is more complicated than this. Commonly it is argued that there are three characteristics that make up the overall “genus” of entrepreneur, regardless of the form that their entrepreneurial activity takes⁴¹:

- **They are innovators** – they want to make a difference by bringing a product or service to market. How they go about doing that, and then how they distribute their profits (either back into the organisation or to the community or stakeholders or to shareholders) is immaterial. They are natural change agents either in the economic or the social space.
- **They are risk takers and naturally take that risk on themselves** – many entrepreneurs regard risk as part of the excitement of their work, whether that work is in setting up a business or in “paid” employment. Many are prepared to take reputational and financial risks in order to see an idea through because their evaluation of the opportunity suggests that the ultimate returns will be worthwhile. Accordingly, they collect information, make judgement calls, raise finance and set up new business entities (either within firms or outside of them) to carry their opportunity forward.⁴²
- **They are entrepreneurial as a state of mind** – they push at the boundaries of accepted norms – of behaviour or knowledge or business practice. In the words of one senior Human Resources professional, “They are a pain to manage and a pain to keep in the business. But the rewards of keeping them are so great that we have to do everything to keep them.”⁴³

So it is the person who is an entrepreneur, not their nationality nor even their cultural or economic setting. They are positive, energetic, and heavily reliant on social capital and networks and in pursuit of solutions to

³⁹ Baumol, W.J. (1993): “Formal Entrepreneurship Theory in Economics: Existence and Bounds.” *Journal of Business Venturing* Vol 8, Issue 3, May 1993, pp 197-210. Elsevier, Holland.

⁴⁰ Baumol, W.J. (1990): “Entrepreneurship: productive, unproductive and destructive.” *Journal of Political Economy* 98, pp893-291 cited in Metcalfe, S. (2006): *op cit*.

⁴¹ See also Parker, S. and van Praag, M. (2006): “The Entrepreneur’s Mode of Entry – Business Takeovers or New Venture Start?” *Max Planck Institut für Wirtschaftsforschung, Jena, Discussion Paper No 26-2006* for a more detailed discussion of the personal characteristics of entrepreneurs, their schooling and their social capital background and the likelihood that they will take over an existing firm or start a new one.

⁴² Casson, M., Yeung, B. Basu, A., and Wadeson, N. (2006): “Introduction” Chapter 1 in Casson, M., Yeung, B., Basu, A., and Wadeson, N. (2006): “The Oxford Handbook of Entrepreneurship.” *Oxford University Press, Oxford*.

⁴³ GEM England Regional Entrepreneurship Monitor (2007) *Expert Interview*.

the economic or social problems that they see.⁴⁴ They may create new markets but, more accurately, they build on knowledge or opportunities or innovations to create new opportunities for wealth creation.

There are, then, two approaches to the same issues of change: on the one hand are those who regard innovators as the drivers of change and, on the other, are those who see entrepreneurs as the mechanism by which innovation *potential* is converted into actual market change through the development and implementation process. The characteristics of each, from the discussion above, are summarised in Figure 1:

Innovators	Entrepreneurs
Deployment of knowledge to create opportunities of various forms: market creation, process improvements, exports, organisation, social, environmental, material	Deployment of knowledge to search for commercial or equally “change” opportunities with financial on non-financial returns and evaluate own risks
Skills, experience and formal learning essential to deployment of knowledge	Formal qualifications less important than capacity to learn, adapt and move swiftly
Strong links to knowledge base	Strong links to know how through social capital embodied in networks
Deals with risk: developing opportunities and ideas from information scanning	Deals with uncertainties or high risks that cannot be insured since information is imperfect and implies some experimentation
Financial risk is the idea as it develops may not be commercialisable	Financial risk is that the enterprise may not be successful

Figure 1
The distinctive nature of innovators and entrepreneurs.

Taking change to be a natural feature of the evolving landscape, then, the Innovator “genus” naturally looks for change opportunities in the knowledge base.⁴⁵ The Entrepreneur “genus” takes opportunities and turns

⁴⁴ Love, JH, Roper, S. (2001): “Location and network effects on innovaton success: evidence for the UK, Germany and Irish Manufacturing.”, *Research Policy* 2001 demonstrate the importance of networking effects; Harding, R. (2006): “Social Entrepreneurship Monitor 2006” London Business School demonstrates the greater confidence amongst social and mainstream entrepreneurs compared to their counterparts in the UK population. Wadson, N. (2006): “Cognitive aspects of entrepreneurship: decision-making and attitudes to risk.” Chapter 4 in Casson et al (2006): “*The Oxford Handbook of Entrepreneurship*” Oxford University Press, Oxford. See also Casson, M. (1982): “*The Entrepreneur: An Economic Theory*” Martin Robinson, Oxford. Arenius, P. and M. Minniti. 2005. “Perceptual Variables and Nascent Entrepreneurship.” *Small Business Economics Journal* 24(3):233-247.

Arenius, P., & De Clercq D. 2005. A Network-based Approach on Opportunity Recognition. *Small Business Economics*, 24(3): 249-265.

⁴⁵ Or, indeed, as Florida would argue, in the creative base as well (see Florida, R. 2002: “The Rise of the Capitalist Class: and how it’s transforming work, leisure, community and everyday life.” *Basic Books, New York. A full discussion of this goes beyond the scope of this report but another way of assessing the creative propensity of a particular society is to look at the numbers of people who would classify as “creative” beyond the orthodox “Creative Industries.”*

them into something that is viable as an “enterprise” (in both the commercial and the activity sense of the word). Of course, within each “genus” are a number of different species – it is possible to be innovative and entrepreneurial in many different contexts.⁴⁶ Common to both, however, is the fact that they are drivers of change in society. The innovator to a large extent provides the platform for that change but, as Piore and Sabel argue, although change is endemic, the direction of that change is determined by choice.⁴⁷

But, and this is a critical difference, it is the entrepreneur who makes some systems more capable of driving wealth creation from the process of innovation since it is the entrepreneur who is a “specialist in taking difficult and complex decisions for which other people do not want to take responsibility.”⁴⁸ It is the entrepreneur who makes the choices about which innovations will reach the market, when they will reach it and how. The entrepreneur takes that reputational risk while, since the finance is often external, it is the financial system that takes the real risk that they might in the end not see the required return on investment. It is, then, the capacity of an economy to produce entrepreneurs that differentiates its capacity to create wealth through innovation since it is the entrepreneurs who have the potential to transform opportunities into business propositions. Effectively, it is the entrepreneurs themselves who make this form of wealth creation endogenous.⁴⁹

Finally, there is increasing political and business interest in those innovative entrepreneurs who innovate in the social space. There is little in the innovation literature itself that focuses on the social innovators⁵⁰ and yet, as a business sector, this area is growing rapidly as a route, not to economic growth as such but to sustainable economic *development*. The area is still emerging and there are issues around the appropriate organisational structures for maximising and perpetuating social innovations with some arguing that the profit motive is more consistent with business and technological innovation while a not for profit organisational structure is more appropriate for producing replicable social innovations.⁵¹ There is, however, a growing number of “not just for profit” or “profit with a purpose” companies who combine social innovations with business or technological innovations. A full discussion of social innovation and socially innovative entrepreneurs goes beyond the scope of this paper. However, these companies employ an innovative type of business model – that of social enterprise⁵² - and their growing importance suggests that they are too important to be excluded from any analysis of innovative entrepreneurs generally and the typology of innovative entrepreneurs developed below can arguably be applied as much to the social arena as to the mainstream business arena since, as discussed above, we are defining all entrepreneurs as

⁴⁶ Harding, R. (2006): “Entrepreneurs: the World’s Lifeline?” Business Strategy Review Blackwell Publishers, Oxford, Vol 17, Issue 4 pp 4-8.

⁴⁷ Piore, M. and Sabel, D. (1984): “The Second Industrial Divide: possibilities for prosperity.” Basic Books, New York

⁴⁸ Casson et al (2006): *op cit*

⁴⁹ Metcalfe, S. (2006): *op cit*

⁵⁰ Interest in the area is growing and work at the Skoll Centre for Social Entrepreneurship and the Young Foundation is increasingly focusing on this area. See, for example, Mulgan, G. with Tucker, S., Rushandara, A. and Sanders, B. (2007): “Social Innovation: what it is, why it matters and how it can be accelerated.” Skoll Centre for Social Entrepreneurship, Working Paper and The Young Foundation.

⁵¹ Mulgan, G. et al (2007): *op cit*

⁵² The important point here is that, along with the Small Business Service definition of social enterprise, these are companies that can be for profit but use/recycle their profit for the purpose of continuing with their social or environmental goals or objectives.



change agents rather than economic wealth creators.⁵³

⁵³ Attempts to measure the scale and scope of social entrepreneurship through survey work are embryonic and limited to the Small Business Survey of Social Entrepreneurs, the Small Business Service Annual Small business Survey and GEM UK since 2004. None of these surveys include innovation or social innovation explicitly.

Toward a typology of innovative entrepreneurs

What is really important for both policy and for businesses, is to understand that while it is possible to be an innovator without being an entrepreneur, and vice versa, there is a specific hybrid “species” – the innovative entrepreneur – who has both the capacity to search for new ideas and to develop, commercialise or implement them. As has already been stressed, these ideas can emerge from the social, the environmental, the technological or the market/competitive environment. Such entrepreneurs combine along the spectrum of entrepreneurship (from the lower end, “arbitrage and pricing” type to the “high end” price leading and market creating type) and innovation (from incremental through to paradigm shifting). This is represented in Figure 2 which shows the types of innovative entrepreneur that can co-exist in an economy:

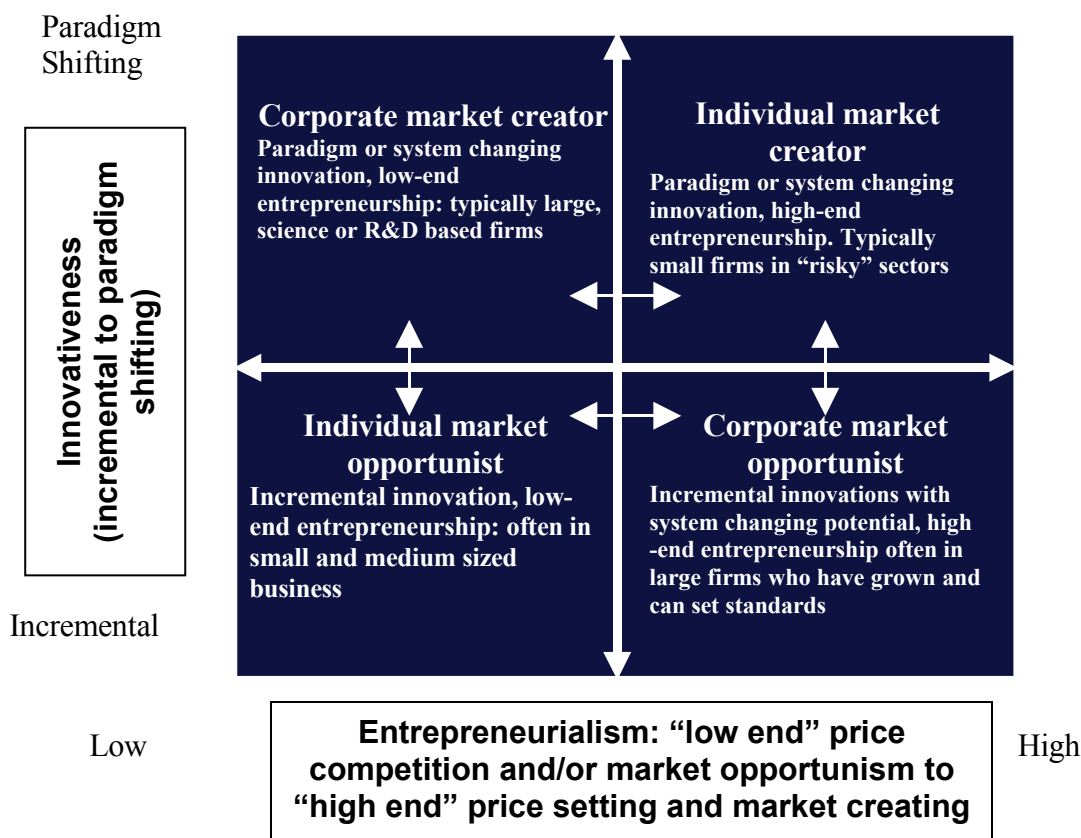


Figure 2

A matrix showing the forms of and organisational outcomes of innovative entrepreneurship


Figure 1 places the innovative entrepreneurs on an innovativeness scale (from incremental through to paradigm shifting) and an entrepreneurial scale (from “low end” (price setting and/or market opportunism) to “high end” (price leading and/or market creating). In each quadrant the entrepreneur is assessing the

degree of risk involved with a particular innovative opportunity and this will result in varying degrees of risk. For example, the risks are low for the Individual Market Opportunist (IMOs) since the innovation is an incremental one and will involve some form of pricing behaviour that will attract customers. In the earliest day of Alan Sugar's activities this was the quadrant he occupied. His opportunity derived from the reverse engineering of existing technologies to produce cheaper but differentiated products. However, he was required to grow the business in order to realise the "system changing" elements because any expansion across the bottom two quadrants requires large amounts of investment in terms of marketing and research and development. Similarly, Jamie Murray-Wells, who set up the online company "glasses direct" saw a market opportunity in the fact that people were being charged for eye testing through high prices for glasses and set up a website to allow people to purchase suitable glasses online following a free prescription eye-test. Effectively he was creating an innovative market opportunity from the combined use of the internet and online sales with the desire to sell glasses at a discounted rate.

Once the company has grown, the innovative entrepreneurs may no longer be the Founder or CEO but are individuals within a corporate context who, as highlighted by the Global Vice President for Human Resources of a FTSE 100 company are, "a pain to manage but absolutely key to ensuring we stay competitive." The management challenge is to retain the spirit of innovative entrepreneurship as the company grows by encouraging individuals to seize market opportunities from within the firm rather than setting up outside it. These are the "Corporate Market Opportunists" (CMOs) – whose job is to identify new areas of development but essentially creating incremental innovations on the back of existing technologies, practices or markets. An example of this is the BP online trading system which was set up by an entrepreneur within the firm, invested in by the company and given three years to be successful. It now generates billions in revenue for the company because of its novelty in the market.

The risks are higher for the Individual Market Creator (IMC) and, indeed, for the paradigm-shifting innovations and high end entrepreneurship, there is a great deal of uncertainty surrounding their activities. The IMC will typically work by themselves or with a small team of trusted people and will create and grow a business that has the potential to change the way in which society and the economy works. Niklas Zenstrom, the founder of Skype, whose mantra is, "You don't need to be big to grow big" created an organisation that has just the potential to shift paradigms in this way through his use of Voice Over Internet Protocol. Again, however, the amount of investment that is necessary to conduct the research, development and marketing that will ensure that the paradigm shifting potential is realised is large and the IMC (if successful) will normally raise capital or undertake a trade sale in order to become a Corporate Market Creator (CMC), as has Niklas Zenstrom in his sale of Skype to e-bay.

Innovative entrepreneurs who make changes can be found in all four quadrants but the CMO and CMC exist within large firms while the IMO and IMC exist in smaller and often younger firms.



All four quadrants in this matrix are interdependent on one another, as illustrated by the directional arrows in the middle of the diagram. For example, large, highly innovative firms which are less entrepreneurial account for the majority of research and development expenditure. Although none of it is paradigm shifting, they are reliant on the smaller, independent innovative entrepreneurs of the top right hand quadrant who engage in much higher risk activity but have the potential to create new opportunities for themselves and the larger firms. Similarly, the innovative entrepreneurial businesses in the system changing, bottom right hand quadrant, may have grown out of smaller, paradigm shifting firms, for example, Microsoft, but have “scaled up” to become progressively less innovative but equally entrepreneurial as they grew. Of course, innovation is not restricted to technological change and the matrix would cater for non-technology but innovating entrepreneurs as much as those in technology sectors.

What is important in the context of this paper is the usefulness of the matrix as a framework for informing the methodology for understanding innovative entrepreneurs. The innovative entrepreneurs in the top left and bottom right quadrants are most likely to be found within large organisations. While they will share many of the characteristics of the IMCs and IMOs, they will be bound by an organisational structure which defines the innovation process. These individuals are hard to isolate within a large firm although they are arguably just as entrepreneurial. However, as discussed below, external surveys, such as the Community Innovation Survey do not attempt to isolate and survey them. Instead, these surveys capture the innovation process within which these entrepreneurs operate and focus on measurable aspects of their activity, such as the percentage of turnover accounted for by new products and processes or the tangible research and development links with universities, others in the market or others in the supply chain.

However, this approach allows us to identify the two groups of innovative entrepreneurs which form the basis of this proposal. The IMCs are of significant interest to policy makers because of their potential for wealth creation in the economy and to the academic community because there is so little survey work on this specific group. The remainder of this paper is a review of existing surveys of innovation and entrepreneurs and a discussion of the methodology necessary to isolate and understand this group of people.

The innovative entrepreneur and its ecosystem

It is, then, the IMCs and CMCs who are the innovative entrepreneurs with the greatest potential to create seismic shifts in the way the economy and society function. As such, they are a country's "endogenous growth" engine and are critical in transferring innovative opportunities into business or social entities that drive change forward.⁵⁴ It would be a mistake to think that this happens by itself, however.

There is a growing acceptance in the literature that it is the process of entrepreneurship, i.e. the means by which innovations are developed into commercial (or social) entities, that creates wealth. No innovation or entrepreneur is alone sufficient to create enduring change. Nor is it enough to have an entrepreneur with a great innovation but no way of implementing it. In short, there must be a conducive "ecosystem" around the innovative entrepreneur as well: again, no one aspect of capital is alone sufficient but all are necessary⁵⁵

This ecosystem is the source of capital for the innovative entrepreneur that can take various forms: from family background, networks and knowledge links⁵⁶ and social capital to finance capital and the co-existence of large firms who rely on the entrepreneurial base as a source for transformational innovations.⁵⁷ It must support risk taking behaviours and the financial system must both support risk and, critically, have the instruments in place to allow investor returns from the risk they take right the way through from the "seed" of an idea to final exit.⁵⁸ There should be strong and supportive government policy to ensure access to growth finance, fiscal incentives to innovate and to invest in innovation and to ensure that the market and institutional environment is supported by strong but supportive regulations. In short, all of these factors comprise the "entrepreneurial capital" of a nation, region or locality and in themselves add to the likelihood that innovative entrepreneurs will be able to realise their capacity to create wealth.

Based on much of the literature reviewed above and the generic types of innovative entrepreneur illustrated in Figure 2, Figure 3 looks at the interdependencies that each has with the sources of "enterprise capital."⁵⁹

⁵⁴ This is consistent with the approach taken by Strom et al (2007): *op cit* who argue that it is the entrepreneurs with growth ambition that have the strongest association with growth in Gross Domestic Product.

⁵⁵ For a discussion of this in the context of venture capital, see Harding, R. (2002): "Plugging the Knowledge Gap: an international comparison of the role for policy in the venture capital market." *Venture Capital Vol 4, No 1. pp59-76. Routledge, London.*

⁵⁶ Minniti, M. (2005): "Entrepreneurship and Network Externalities." *Journal of Economic Behaviour and Organisation Vol 57 (1) pp 1-27.*

⁵⁷ Della-Giusta, M. and King, Z. (2006): "Enterprise Culture" chapter 24 in Casson, M., Yeung, B., Basu, A., and Wadeson, N. (2006): "The Oxford Handbook of Entrepreneurship." *Oxford University Press, Oxford.*

⁵⁸ Harding, R. (2000): "Venturing Forward: the role of venture capital policy in stimulating entrepreneurship." *IPPR, London.*

⁵⁹ See also Casson, M. (2006) *op cit* for a more detailed discussion of entrepreneurial characteristics and the data discussed below from the GEM UK study.

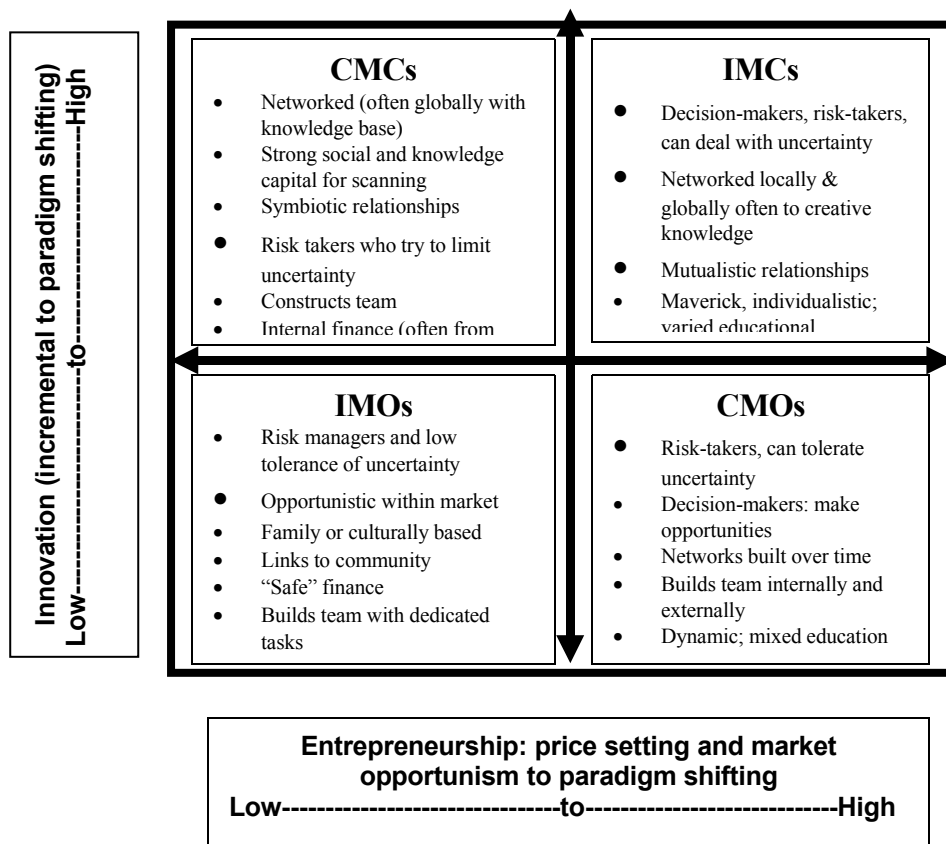


Figure 3
Stylised picture of “Enterprise Capital” for different types of innovative entrepreneurs

Figures two and three together can be summarised in two key points:

- First, there is a spectrum of “innovative entrepreneurship” from low end, incremental innovations to paradigm shifting behaviours and innovations. Both are important in terms of jobs and productivity but the further along the spectrum towards paradigm shifting behaviour one moves, the more likely it is that innovative entrepreneurship will create real long term shifts in the wealth base.
- Second, all innovative entrepreneurs are dependent on the ecosystems around them, culturally, socially, financially and in terms of access to the knowledge and creative base. These networks indicate interdependence between large and small firms and between the sources of knowledge/creativity and normative support in the cultural base.

It is “enterprise capital” that allows the innovative entrepreneur to develop and commercialise their idea. Building viable entities requires capital, experience, skills and leadership.⁶⁰ Enterprise capital defines the construction either of a team internally, to build and grow the opportunity or an external, mutualistic, support

⁶⁰ Mullins, J (2003): “The New Business Road Test” FT Prentice Hall

network of entrepreneurs (within existing firms or building their own firms) who have a stake reputationally or financially in a successful outcome.⁶¹

Finally, throughout the text thus far, ecological terminology has been used and it is in the context of the discussion of enterprise capital and how to measure it and its relationship with the innovative entrepreneur that this becomes useful:

- *Innovations emanate from the cumulative evolution of the relationship between the innovator and the innovation system over time.* Any survey of innovation or innovativeness should include an analysis of these linkages.
- *Entrepreneurs rely on strong and mutualistic relations with stakeholders and agents locally, nationally and globally:* mutualism implies that there is no interdependency between actors in the network but there are outcomes from entrepreneurship which will be mutually beneficial. Any survey should be able to quantify these as well.
- *Innovative entrepreneurs whose activity results in systemic change create mutations in the ecosystem around them:* in other words, while the relationships between people and institutions remains the same, the way in which they interact changes.
- *Innovative entrepreneurs whose activity is paradigm shifting will create speciation:* in other words, a new system will emerge from their activity that fundamentally alters the way in which players interact.

In other words, we can develop a tentative and working definition of the innovative entrepreneur as follows: a person who identifies an opportunity from an innovation, whether social or commercial, evaluates its market potential based on their own knowledge networks and social, financial or educational capital, and establishes an organisational structure, either within an existing entity or by creating a new one, that allows that innovation to be developed. Any survey and any measurement needs to be able to capture both of these types of change as well as the interaction if it is to be capable of understanding the impact that the innovative entrepreneurs have on wider society.

⁶¹ *Successive GEM studies suggest that networks are consistently seen by entrepreneurs as of vital importance.*

Existing surveys of innovative entrepreneurs

The foregoing analysis suggests that measuring levels and types of innovative entrepreneurship, constructing a survey to find out attitudes and motivations, establishing where ideas come from, how networks work and how the innovative entrepreneur grows their enterprise (in the broadest sense of the word) will need to overcome certain methodological difficulties. In particular:

- The interdependencies between the innovative entrepreneur and their internal and external networks cannot be measured directly and monitored except by using a proxy as a substitute measurement. All of the innovation surveys reviewed below have mechanisms for measuring partnerships, while the entrepreneurship surveys also have mechanisms for understanding some of the cultural interdependencies (such as the questions which probe the extent to which a range of attitudes influences the entrepreneur).
- Innovative entrepreneurs are intrinsically hard to survey. The “incremental” innovative entrepreneurs are frequently “hidden” within firms and therefore only accessible through workplace surveys and case studies. The innovative entrepreneurs are either owning and running small firms, very busy and therefore hard to access or are not identifiable through standard database sources such as Dun and Bradstreet because they have grown to the extent that they have executives running their entities rather than doing it themselves.

Further, because the innovation and entrepreneurship literatures have become somewhat divided, surveys tend to look *either* at the innovation process within firms *or* at the entrepreneurial process outside of firms. There is very little in the UK at least that looks meaningfully at the process of “intrapreneurship” (in other words innovative entrepreneurship within firms) beyond the DTI’s⁶² Gross Value Added Indicators⁶³. Assessing how particularly mid-sized businesses innovate remains something of a holy grail.⁶⁴ Similarly there is very little within the entrepreneurship survey work that combines an understanding of the social/cultural dimension with an understanding of networking *and* that can guarantee a reliable sample of innovative entrepreneurs themselves.

There are a number of surveys which are aimed at understanding either the innovation process or the

⁶² Now the Department of Business, Enterprise and Regulatory Reform

⁶³ The DTI’s value added scoreboard (http://www.innovation.gov.uk/value_added/default.asp?p=home) ranks companies in the UK and Europe in terms of the value they add financial through the innovation process on the basis of published company data.

⁶⁴ Rebecca Harding: discussions and interviews conducted as part of the scoping for this interim report, for previous work on the UK’s innovation system and GEM UK. This is a perennial issue that practitioners raise as a weakness in the innovation evidence base and something which a number of RDAs are currently dealing.

entrepreneurial process however. The innovator surveys all use the OECD's Oslo definitions of innovation.

Thus they use the following terminology:

- Product innovation: tangible goods and services that are new to the business or new to the market.
- Process Innovations: changes in the way goods or services are delivered and again new to the business or the market.
- Evidence of investment in Research and Development (R&D) (for example capital goods, software and design).
- Management innovations.

There is no similarly universally accepted definition of entrepreneurship that underpins the evidence base in this area.

- *The Community Innovation Survey (CIS)*: Conducted every 4 years across the European Union. In the UK the sample is of 28,000 firms with ten or more employees with an achieved response rate of 58%. The current data covers the 2002-2004 and provides a "snapshot" of innovation inputs and outputs (partnerships and linkages, numbers engaged in R&D, as well as turnover accounted for by "innovations.").⁶⁵ This survey finds that 57% of UK firms are innovatively active and 25% of all firms are innovators. 16% of these are innovators in terms of processes and 57% in terms of new products and implementing new systems. In one third of cases, new product or service quality had had a positive impact on turnover. The most common form of partnerships to generate innovation were with other market players and internally.
- *Confederation of British Industry/Qinetiq Innovator Survey (CBI)*⁶⁶: This is a survey of the CBI membership in 2005 (although a repeat of a previous survey). 1400 members were contacted of who 173 both responded positively and were interviewed. 162 of these were business members (at senior executive level) and 11 were based in universities. The survey found that 93% of respondents rated innovation as important, particularly the larger firm respondents, and of those

⁶⁵ Robson, S. and Ortman, L. (2006): Economic Trends 628 Office of National Statistics, March 2006. DTI (2006): "Innovation in the UK – Indicators and Insights" Occasional Paper No 6

⁶⁶ <http://www.cbi.org.uk/pdf/ir05mori.pdf>

who were innovating, 94% was funded in house out of profit.

- *Cambridge-Massachusetts Innovation Benchmark Survey (CMI)*⁶⁷: This is a survey of 3600 “matched” companies (by sector and size) in the UK and the US looking at levels of innovation and new technology interactions and partnerships. The sample was stratified to include all manufacturing sectors and some business services and excluded all companies with under ten employees. A quota of 25% were in hi-tech sectors and 75% were “conventional.” It finds that the majority of university-industry interactions are informal but that more formal interactions in the form of graduate employees, conferences and publications are seen by companies as producing a greater return in terms of higher innovation. UK businesses did not rate these activities as being as important as their US counterparts but in neither country were these interactions a large proportion of innovative activity within firms.
- *Engineering Employers’ Federation Innovators’ Survey (EEF)*⁶⁸: This is a follow on survey from the EEF’s 2004 survey, “Catching up with the continent” looking at the extent to which UK manufacturing businesses are innovating. Their sample was of 500 companies broadly across UK manufacturing, quota-sampled to reflect the make-up of the EEF’s membership. A further sampling quota was applied to make sure that 85% of the respondents were innovators. This survey found that 71% of all innovators had increased spending on innovation in the last three years and that 95% of them used internal finance to fund their innovations. 92% of innovators had innovation partners (either customers or with companies in their supply chain) but very few had partnerships with the research base or with government. Some 48% of them struggled to find the right partner but, as a measure of how networked innovation is, 31% had partners regionally, 45% nationally and 22% globally.
- *Flash Eurobarometer, European Union Entrepreneurship Survey (EU)*⁶⁹: This was an annual telephone survey (last conducted in 2004) of 21,051 respondents across the EU, with 1003 from the US, 501 from Iceland, 500 from Liechtenstein and 500 from Norway. It is an opinion poll looking at attitudes towards self employment and was constructed as part of the EU’s desire to establish why

⁶⁷ <http://www.cbr.cam.ac.uk/pdf/InnovationBenchmarking1-7.pdf>

⁶⁸ Engineering Employers’ Federation (2006): “New Light on Innovation: How UK manufacturing is meeting the challenge.”

http://www.eef.org.uk/NR/rdonlyres/FD06B3C6-5D16-4B36-A364-23EA3EE852F6/7611/63920_InnovationLKD1.pdf

⁶⁹ European Commission (2004): “Flash 160 “Entrepreneurship” EOS Gallup, Europe,

the EU has lower levels of self-employment and high growth firms than the US. It is not a survey of innovativeness. It finds that most EU citizens have never considered setting up a business but that if they have, they do so to take advantage of a new opportunity.

- *Global Entrepreneurship Monitor (GEM)*⁷⁰: This is an annual telephone survey of adults of working age in 42 countries around the world. Sample sizes vary between 2,000 and 43,000 randomly selected adults. It asks the whole sample of respondents about attitudes towards entrepreneurship and setting up a business and, of those who respond that they are setting up a business, it also asks about the novelty of their product or service to customers and markets. Additionally, the UK survey (of 43,000 individuals) asks questions about innovation partnerships. The study finds that some 22% of UK entrepreneurs can be classified as “innovative” in that they bring products or services to the market that are new to some or all customers *and* have none or few market competitors. More detail about these entrepreneurs (their networks, attitudes and motivations in particular) is given below.
- *Small Business Service Household Survey (SBS)*⁷¹: Like GEM, this is a telephone survey of the general adult population to determine levels of business ownership, self employment and entrepreneurial activity. It also examines motivations and attitudes and is conducted on a sample of 15,696 people aged 16-64 in England every two years (the most recent survey is 2005 which also included Scotland). In 2005 it found that 13.1% of the UK population was either self employed or running their own business with a further 11.6% thinking about setting up a business.
- *The Work Foundation Work and Enterprise Survey (TWF)*⁷²: The Work Foundation surveyed 1000 companies in 2003 and 3000 companies in 2004 about areas of strategy including innovation and innovation partnerships. The companies were selected to be a representative sample of all sectors and sizes of UK industry⁷³. The two studies found that innovation was a critical part of the “bundle” of intangible activities that drove competitive performance across the UK.

⁷⁰ www.gemconsortium.org

⁷¹ <http://www.dti.gov.uk/files/file38261.pdf>

⁷² Published as Harding, R., Cowling, M. and Turner, N. (2003): “The Missing Link: From Productivity to Performance” and Bevan, S., Cowling, M., Horner, L. Isles, N. and Turner, N. (2005): “Cracking the Performance Code: How Firms Succeed.” The Work Foundation, London.

⁷³ It is not always possible to capture the very largest companies (e.g. the FTSE 100) as they often have policies of not participating in surveys. The sample was drawn from a Dun and Bradstreet database and excluded micro enterprises.

What we do know about innovative entrepreneurs?

None of these studies is designed with the explicit intention of adding to our understanding of innovative entrepreneurs and innovative entrepreneurship. The innovation process studies (the CBI, CIS, CMI, EEF and TWF studies) give us an idea of innovation partnerships and their link with performance and tell us a little about financing as well. Broadly speaking, they are directed at the innovation *process* that is inherent in all except the top right-hand quadrant of the matrix but tell us little about the people that make the process happen. Similarly, the studies that survey adult populations (EU, GEM and the SBS) tell us about levels of entrepreneurial activity generally but not about how innovative it is. The SBS household survey in particular is limited to overall entrepreneurial activity while the EU study is simply an opinion poll. Both are therefore arguably looking at the IMOs but not necessarily at the IMCs in Figure 2's matrix

While GEM globally falls into the same category of understanding general self employment and entrepreneurship, it has had for the last three years the capacity to isolate those entrepreneurs who set up business entities that bring new products or services to the market and that have few or no competitors. This definition of the "innovative entrepreneur" is broadly in line with one aspect of the OECD's Oslo agreement (that of the newness of product or service). There are issues with using this definition exclusively in that the partnerships, access to finance, new work organisation and innovation within the firm are excluded.

As a result of these considerations, GEM UK introduced questions that would include the partnership and access to finance issues as well as the standard GEM questions on family background, attitudes and perceptions and whether or not the business has been set up as part of current employment (this is a proxy, albeit a limited one, for entrepreneurial activity within firms).

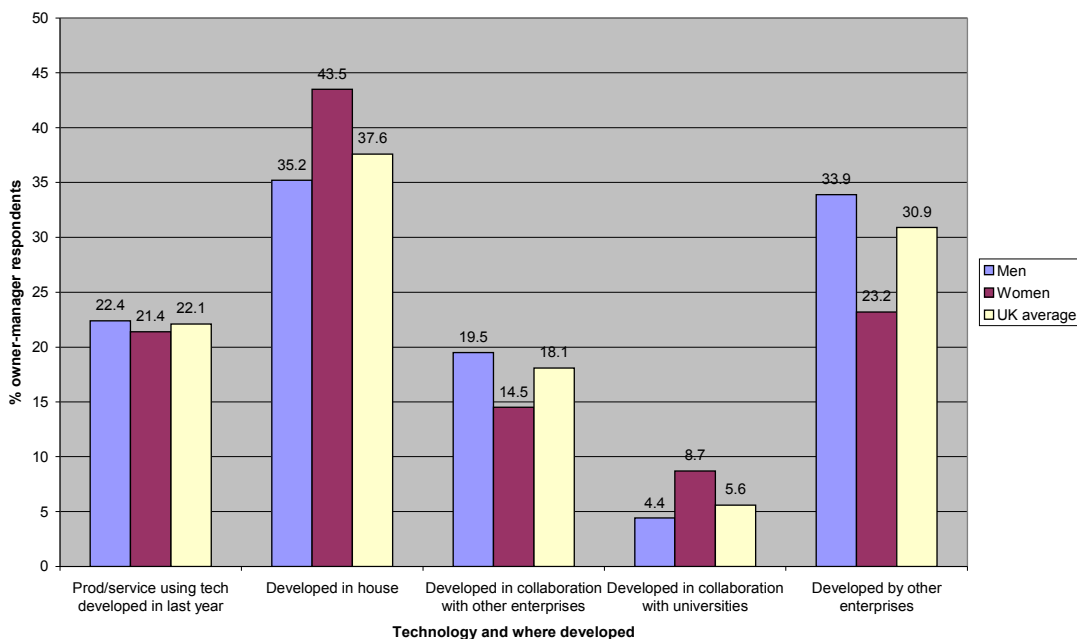
A summary of the results in 2006⁷⁴ is as follows:

- 5.8% of the UK population is involved in setting up a new business entity. The majority of these (85%) are doing so to take advantage of an opportunity. This has not changed significantly over the

⁷⁴ Only the results for 2006 are given here. This is for two reasons: first, very little has changed since 2003 when the questions were first asked and second, the numbers are bigger in the 2005 dataset (on which the 2006 report was based) and hence more reliable.

past five years.

- 22.7% of these were creating new product markets and had few or no competitors.
- While there is no statistically significant gender difference in the likelihood that an individual will be developing a new product market through entrepreneurial activity⁷⁵, males are more than twice as likely to start-up in the technology sector (early stage activity amongst men is 12.2% compared to 4.7%).
- 22.9% of all “innovative entrepreneurs” have spun their business out of an existing family firm. This figure does not differ significantly to all entrepreneurial activity.
- The most likely age group to be setting up an entity in a new product market are 55-64 year olds.
- 18-24 year olds are the most likely to be running an established business creating new product markets (5.7%) while 35-44 year olds are most likely to be running an established business in medium or high tech sectors (13.2%).
- Of the respondents who said that they already owned and ran a business (either at the start-up phase or older), 22.1% had introduced a new product or service using new technology in the last year. Over a third of these were developed in house but nearly 20% of men and 15% of women will have developed their product in collaboration with other enterprises and twice the number of women will have collaborated with universities to develop their product or service as men (8.7% compared to 4.4%). These results, illustrated in Figure 4 are consistent with other surveys in that the most common response was that the “innovative entrepreneurs” did their innovative work in house. However, there is also a substantial amount of external networking as well.



⁷⁵ The figure for female entrepreneurship in new product market areas is 1.5% lower than for men although this is not statistically significant

Figure 4: Research and development collaborations by gender

Source: GEM UK APS

In terms of the social/network capital then, we do know that innovative entrepreneurs, as defined by GEM UK, are more likely to have networked research and development partnerships than their counterparts in organisations and businesses that are larger.

Similarly, the innovative entrepreneur, as defined by GEM, has a far stronger perception of entrepreneurial attitudes and greater networks (proxied by “knowing an entrepreneur”) than is average for all respondents in the UK and for all entrepreneurs. This suggests that their social capital, as measured by their confidence is greater, as illustrated in Figure 5.

	“Innovative Entrepreneurs”	Non-innovative entrepreneurs	All respondents
I expect to start a firm in the next three years	67.5	34.1	7.8
I know an entrepreneur	68.0	49.1	27.2
There are good start up opportunities	74.6	63.6	36.8
I have the skills to start a business	90.5	91.8	49.6
Fear of failure would prevent me starting	12.7	16.6	35.8

Figure 5

Attitudes and perceptions of “innovative entrepreneurs” and all respondents (% 2006)

Source: GEM UK 2005 APS

An average innovative entrepreneur, as defined by GEM, will require £15,000 in start up finance of which they will put in £10,000 themselves. The rest they seek from external finance, as illustrated in Figure 6 which compares these entrepreneurs with all entrepreneurs across the UK.

	“Innovative Entrepreneurs”	Non innovative entrepreneurs	All respondents
Friends and family	23.2	20.4	18.9
Individual investor (not related or known)	32.9	6.6	6.6

Unsecured bank loan	14.3	13.6	14.7
Overdraft	24.7	25.4	30.5
Non bank unsecured loan	5.8	5.1	5.5
Mortgage or other secured loan	16.3	15.9	16.1
Equity finance	5.3	4.5	4.2
Government grants	13.6	8.1	9.3
Credit cards	19.3	16.6	15.2

Figure 6

Sources of finance used by entrepreneurs: “Innovative” and “mainstream” compared (%), 2006

Source: GEM UK APS 2005

There are two striking features of Figure 6. First, “innovative” entrepreneurs are far more likely than their mainstream counterparts to use individual investors (informal investors such as business angels) suggesting that they are networked outside of their family and friends and have mutualistic stakes in each others business. Second, they are rather less likely to use overdraft than all the respondents to this question but, like mainstream entrepreneurs prefer the “short term” stop gap financing of credit cards.

Questions for further research: towards a survey design

It is important to distinguish between the “innovative entrepreneur” and the “innovation process” in any further survey work that is done. The innovation process is the interaction between individuals within an organisation or business once the innovative entrepreneur has identified, articulated and devised a strategy to implement, a commercial opportunity from an innovation. The process can take place in existing enterprises or in new entities and is measurable through input and output proxies such as amount spent on R&D or percentage of turnover accounted for by “innovations”. However, the “innovative entrepreneur” is an individual and the interest of any further work should be on identifying their attributes, the sources of their ideas, their finance, their social capital networks, their knowledge capital and, of course, the challenges and barriers that they face.

The theoretical concept of the “innovative entrepreneur” has to be translated into a practical definition that will enable an appropriate sampling frame to be developed. This requires some filtering of available databases from which samples can be derived. In particular, interest lies in the early stages and growth processes before the entity established by the innovative entrepreneur has become large either in terms of turnover or in terms of employees.

Indeed, the studies reviewed here do not set out explicitly to survey innovative entrepreneurs and, hence are not in their current form capable of substantially adding to our understanding of this group of individuals. For example, the Community Innovation Survey is a set of questions about innovation processes and innovation characteristics asked of a large sample of businesses across regions and sectors of the UK. It is not a survey of the innovative entrepreneurs themselves but rather focuses on innovation links, innovation strategies and innovation processes. Conversely, the Global Entrepreneurship Monitor (GEM) is a large scale household telephone survey of adults of working age selected by random digit dialling (RDD) across the UK of whom a proportion will be innovative entrepreneurs. However, as it is a survey of very many aspects of entrepreneurship and not just innovative entrepreneurs, it has limited flexibility to add questions to yield greater understanding of this group.

A summary of the different surveys covered in the report is given in Figure 7.

	Who surveyed	What focus	Where sample drawn from	How useful to understanding innovative entrepreneurs
Existing surveys				
Community	Postal survey	Innovative	Inter-	Looks at

innovation survey	of 28,000 companies with more than ten employees; 58% response rate	characteristics of and innovation processes within firms	Departmental Business Register	characteristics, types and barriers to innovation in firms but does not look at innovative entrepreneurs. Does not have the capacity to add questions or to use as base for sample frame.
CBI innovation survey	Telephone survey of 1162 members of whom 173 replied; last conducted in 2005	Innovation processes and barriers; financial characteristics	Membership	Survey is of CBI members some of whom may be founders but this is not disclosed. Focus is on support systems and processes (especially financial) rather than entrepreneurs
CMI	Telephone survey: 3600 companies “matched” in terms of size and sector in US and UK; 2004	Benchmarking between the US and UK in terms of levels and types of innovation	Dun and Bradstreet; firms excluded with fewer than ten employees; all	Survey is of firms not individual entrepreneurs. Samples matched but no scope for adding in



			companies are innovating; quota: 25% in high tech	questions or using sampling frame – can reproduce using Dun and Bradstreet company register and OECD innovation definitions
EEF	Telephone survey of 500 manufacturing firms	Innovative characteristics of and innovation processes within firms	Sample from membership; quota to ensure 85% innovators	Manufacturing firms only, not entrepreneurs (although some may be founders). Can reproduce innovation filters by using OECD innovation definitions
TWF	1000 and 3000 firms of all sizes with sectoral stratification	Links between “intangibles management” such as innovation process and productivity	Telephone survey: Dun and Bradstreet company register	One off studies of firms and strategy – not of innovative entrepreneurs
Eurobarometer	1001 in selected EU member states	Attitudes towards self-employment	Random Digit Dialling – telephone survey opinion polling	Opinion poll – sample very small and no focus on innovation
GEM	Telephone survey 43000	Attitude and motivations,	Random Digit Dialling	Allows some categorisation



	adults of challenges and working age types of in UK entrepreneurship		of entrepreneurs into “innovative” grouping; potential to be base of sampling frame though sample sizes would be small
SBS	15896	Attitudes and barriers to entrepreneurship	Random Digit Dialling Not useful as base for broader sampling frame; does not add to our understanding of innovative entrepreneurs

Data Sources			
	What data source can offer	Usefulness	to further research
Inter Departmental Business Register	All companies registered for VAT or registered with HMRC for pay as you earn or registered with Companies House. Dataset includes: Name, Address, Standard industrial classification, Employment and employees, Turnover, Legal status (company, sole proprietor, partnership, public corporation/nationalised body, local authority or non-profit body), Country of ownership, Company number, Intrastat data on the value of goods and services that are traded (imports	Limited:	ONS data source used by government departments.

	& exports) between the EU member states and the UK.	
GEM	22% of all early stage entrepreneurs are innovative. Indicatively on a sample of 43,000 ⁷⁶ this is around 830 responses. GEM asks if people are willing to be re-surveyed and these individuals over the past three years ⁷⁷ could be re-contacted and a new questionnaire asked of them	Advantage is that it is random; disadvantage – high attrition on domestic telephone lines, high levels of business closure; small scale of many of the businesses within the GEM survey (by nature of its sampling). Definition of innovation insufficiently broad
Dun and Bradstreet	Company register, 680,000 companies with more than 5 employees OR more than £250,000 in turnover per year. Data includes: Fax numbers, Head office and branch information, Names of directors, partners or proprietors, Industry sector, Turnover, profit and loss, Number of employees, Net worth, Standard Industrial Classification Code and description, Company registration number	Allows research to capture micro enterprises with 0-10 employees but that are substantial enough to have growth potential in that they have already grown (either >5 employees OR >£250,000 turnover) ⁷⁸

Figure 7

Summary of the surveys covered in the literature review and of potential sampling frames


Concluding remarks

This summary of the literature and discussion of surveys has yielded a number of challenges to any future work that seeks to identify innovative entrepreneurs and to find out about their “enterprise capital”.

⁷⁶ NB, sample sizes have varied since the questions were first asked but 830 is the largest annual sample. Indicatively only, the sampling frame could be drawn from an initial sample of around 1400. However, there will be very high attrition (around 50% per year) on these numbers because GEM is a household survey: people move, telephone numbers change and business entities close to name a few reasons why this might be the case. In reality, the total sample size is unlikely to be above 500.

⁷⁷ Only three years of contact details can be used as we have set four years or younger as our sampling frame.

⁷⁸ To capture some of the firms with exponential growth, it may be necessary to over sample the larger firms as the sample is potentially biased as the majority of small firms are less than four years old and have turnovers and employee structures captured within this remit.



First, four categories of innovative entrepreneur were defined: Individual Market Opportunists, Corporate Market Opportunists, Individual Market Creators and Corporate Market Creators. The types of organisation, network structure, sources of finance and attitudes will differ between these groups of innovative entrepreneur and this presents some practical difficulties in isolating the group that has the most intrinsic interest to policy and to the evidence base.

Second, it is important to distinguish between the “innovative entrepreneur” and the “innovation process” in any further survey work that is done. The innovation process is measurable through input and output proxies such as amount spent on R&D or percentage of turnover accounted for by “innovations”. However, the “innovative entrepreneur” is an individual and the interest of any further work should be on identifying their attributes, the sources of their ideas, their finance, their social capital networks, their knowledge capital and, of course, the challenges and barriers that they face.

Finding innovative entrepreneurs and then surveying them is difficult and the majority of surveys deal either with entrepreneurs or with innovation processes but rarely with both. The only survey that goes somewhat towards addressing these issues is the GEM UK survey and the data presented in this section would appear to corroborate the assumptions from the literature that innovative entrepreneurs tend to be more networked, have positive attitudes and confidence and will use collaborative partnerships both for sourcing knowledge and ideas and for sourcing finance appears to be corroborated.

However, GEM is limited by its definition of “innovative entrepreneur” in that it just focuses on those entrepreneurs who have introduced new products or services and have few competitors. While this is consistent with the literature, or at least some aspects of it, it precludes other types of innovation such as improvements in quality, market expansion or innovations in organisation. More than this, the sample sizes in GEM of innovative entrepreneurs are necessarily small (in 2005 just 449) means that, although the sample is randomly selected and therefore representative, it is impossible to do substantial regional analysis or delve beyond descriptive headline indicators. Finally, GEM can tell us little about the sources of ideas or the challenges and barriers that innovative entrepreneurs face, nor can it definitively isolate those innovative entrepreneurs who are “paradigm shifting”.

Many of the “innovation process” surveys do give some interesting insights into the link between innovation strategies and linkages generally and innovation performance. But they do not isolate the innovative entrepreneurs within the firms and do not look at the normative (or intangible) aspects, broadly the enterprise capital, that may influence their behaviours.

There are therefore a number of research questions which subsequent research should seek to address:

1. To what extent are the findings on social, network, knowledge and finance capital produced by GEM corroborated by a wider and more specific sample of innovative entrepreneurs?
2. In defining the “innovative entrepreneur”, where does the primary interest lie? Is it with their behaviours or is it with their impact? If the latter, then proxies for innovative behaviours, such as R&D output and value added, can be used for those businesses that have company accounts registered with Companies’ House, as the DTI’s value added scorecard demonstrates. However, if the interest is in behaviours (using other quantitative mechanisms to estimate impact) then it would be more appropriate to survey the entrepreneurs themselves.
3. What survey vehicles are needed to assess the behaviours and influences on those behaviours of innovative entrepreneurs? The innovative entrepreneurs within firms may best be accessed through workplace surveys; a broader survey of the individual “paradigm shifting” entrepreneurs is a more appropriate vehicle for that group.

All in all, our understanding of the innovative entrepreneur is still limited to their outputs, qualitative studies and the attempts within GEM to begin to measure some of the behaviour traits of this vital group of people. This is not an insurmountable problem and is well worth the effort if we are to formulate policies and programmes that will, indeed, create the enterprise capital that allows the paradigm shifting innovative entrepreneurs to flourish.