

Executive summary

- The UK's economic recovery will be spearheaded by entrepreneurs. With employment in the public sector set to shrink as the government seeks to restore its finances, the jobs created by entrepreneurs will be vital to reducing unemployment.
- In the economic upturn between 2005 and 2008, the 6% of established companies¹ who were fastest growing created 1.3 million jobs, more than half of the new jobs created in established businesses. It is not unusual for such companies to be able to triple their workforces over a three year period.
- While business start-ups are undoubtedly important for innovation, entrepreneurship is about much more than the creation of new businesses. The most economically significant high-growth companies have already been in business for several years, and reached an intermediate size ranging from 250 to over 1,000 employees. The key role of these mid-size entrepreneurs has often been overlooked.
- Combining the flexibility and close market connections enjoyed by small firms with the capacity for research, training, product and geographical spread more easily attained by larger ones produces strong company growth. This led to mid-size innovators being the major creators of new jobs during last economic upturn. Their more recent performance, although it cannot yet be systematically assessed, suggests greater resilience to the subsequent slowdown than smaller innovative companies.
- Their size means that large companies create large *numbers* of new jobs, but their *rate* of employment generation is generally very low. They are also important sources of economic growth because they contribute heavily towards R&D expenditures and outcomes. However, internal barriers seem to be a hindrance and commercialisation of new technologies and ideas is frequently left to smaller entities.
- Common characteristics of firms that achieve and sustain rapid growth include proprietary technology and diversification across related products and into different geographical regions. There also tends to be close cooperation with customers in developing and deploying new technology, and accumulation of managerial skills and internal financial reserves before entering the high-growth phase.
- Government support for R&D remains important to create the 'raw material' for innovation, and business start-ups are important for turning R&D into commercial opportunities. However, the macroeconomic benefits from government support could be increased if policy is redirected towards promoting the development of mid-sized companies.

¹ ie with 10 or more employees

Introduction

The role of entrepreneurs in driving economic growth is often misunderstood and understated. Academic studies have often identified very small, start-up enterprises as key promoters of radical innovation and the fast growth it can underpin. However, lack of detailed analysis of where innovation and rapid growth occur has meant that the economic contribution from mid-size firms which continue to grow rapidly – or enter their first phase of rapid growth some time after start-up – has not yet been fully recognised.

The contribution of high-growth, innovative businesses to the UK economy is now being analysed in unprecedented detail using the Office for National Statistics' (ONS) new Business Structure Database, and equivalent databases for other large economies.

Early assessments of the UK data support the longstanding evidence from smaller samples that entrepreneurship is crucial to the promotion of new technology, investment, job creation and production growth. But the location of this enterprise turns out to be more widely spread than in the traditional image of entrepreneurship. Small, start-up companies play an important role – but so do medium-sized companies several years on from their creation, and larger companies transformed by a change of ownership.

Entrepreneurship: transforming knowledge into marketable innovation

The 'classic' entrepreneurial firm is created around a bright idea whose commercial potential has been missed by big, established players. So, for example, Xerox builds a small computer with a graphical user interface but cannot see any market for it. The concept sits on a shelf until a young Steve Jobs visits the lab. While Jobs could launch the Apple Mac because a big corporation had failed to grasp the market-changing importance of its prototype, incumbents are more typically aware of their discoveries' potential but unwilling to follow it through.

Large companies often recognise the disruptive potential of a new idea and so deliberately ignore it to avoid upsetting their existing customers and product lines (Christensen 1997). So, for example, UK broadcaster Sky could not expand onto the new Freeview platform without undercutting its existing satellite-dish network, and it was left to two executives (Ian West and David Chance) to resign and launch what became the rival Top-Up TV. IBM's commitment to the mainframe computer, and Digital's to the minicomputer, prevented both from exploiting the potential of the microcomputer, leadership in which was therefore lost to newer entrants.

Instances such as these have given rise to a widely endorsed "knowledge spillover theory" of entrepreneurship. This is where entrepreneurs are viewed as insightful outsiders who spot the commercial potential of new ideas, from which their originators are distracted by corporate or academic bureaucracy. The theory explains why large inputs to innovation in the form of research and development (R&D) expenditure, and even large innovation outputs in the form of patents and new-technology prototypes, don't easily translate into faster growth of productivity and output.

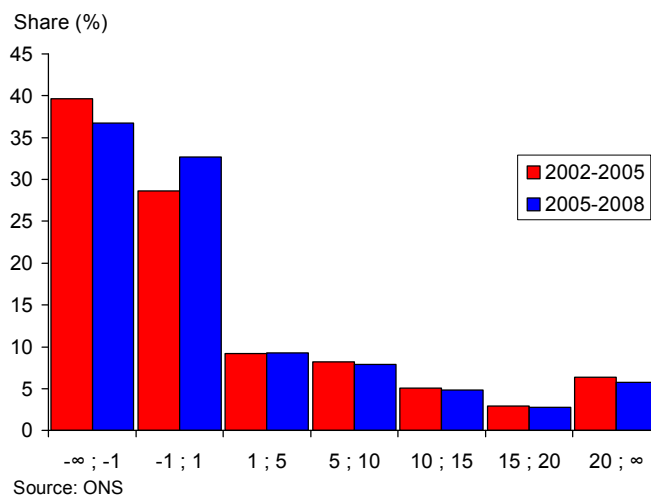
Entrepreneurship is the missing link. It redirects the new process towards the workplaces and products where it makes the biggest difference. It targets the new product at its most appropriate market – which is often one that was previously served by very different suppliers or didn't exist at all.

High-growth businesses play a key role in generating employment

New research confirms the important role of entrepreneurial companies in connecting new knowledge to the market, and the substantial positive effect this can have on surrounding businesses, communities and regions. But the systematic study made possible by larger business databases also shows entrepreneurial companies come in more shapes and sizes than previously assumed.

Tracing the links between employment, sales growth and company characteristics using the ONS Business Structure Database, Anyadike-Danes et al (2009) credits entrepreneurial dynamism for more than half the UK's job creation through the last economic upturn. While high-growth companies represent only 6% of all UK firms employing ten or more people, they were responsible for 1.3 million out of the 2.4 million increase in new jobs in established businesses between 2005 and 2008. High-growth firms were 6.4% of the total in 2002-5, and 5.8% in 2005-8, but were responsible for almost two-thirds of new jobs created in 2002-5, and over half of those created in 2005-8.

UK: Distribution of firms (+10) by employment growth



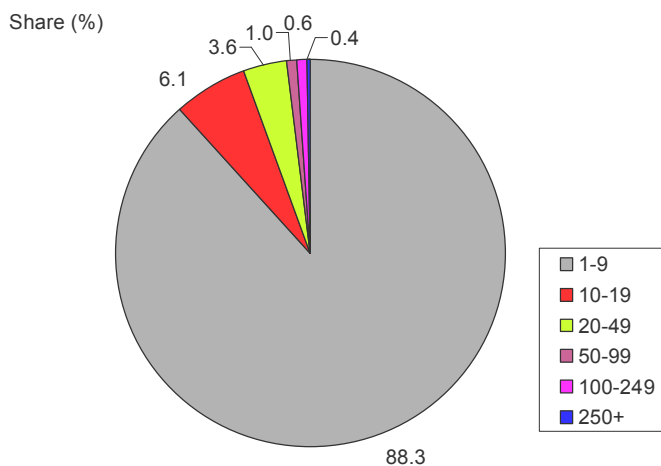
High-growth firms are here defined (in common with the Organisation for Economic Cooperation and Development, OECD, in its internationally comparable data) as those that start with a workforce of at least ten and increase by over 20% per year for at least three years.

The study found that of the 178,188 UK firms with ten or more employees that traded throughout 2002-05, more than two-thirds recorded low, zero or negative employment growth. Not only did just 6% attain high employment growth (on the OECD definition), but only 2.6% (fewer than 5,000) achieved high employment growth while also raising turnover per employee (Anyadike-Danes et al 2009).

Micro-enterprises in the UK – those of ten employees or less – expanded their employment from 2.5 million in 2002 to 3.6 million in 2005. But this 1.1 million boost was due mainly to the increase in the number of such enterprises by 600,000. It owed little to employment generation by existing enterprises:

average employment at such firms declined to 2.4 from 2.8 over the period. So while micro-enterprises comprised 88.3% of all UK enterprises in 2005-8, they contributed less than 20% of employment. Indeed, if micro-enterprises are included, the contribution to employment growth of the (predominantly larger) high-growth firms appears even more dramatic, since they comprised less than 1% of all firms.

UK: Distribution of firms by size, 2005-2008



The central role of mid-size firms

Recent research, including studies sponsored by NESTA (National Endowment for Science, Technology and the Arts), reveals the significant economic contribution from firms that have ceased to be 'start-ups' and have already grown significantly, at a measured pace, before their expansionary take-off.

The average high-growth firm increased its employment from around 60 in 2005 to more than 170 in 2008, confirming that small and medium-sized businesses were central to recent UK employment generation. Strikingly, very few start-ups in the UK experience an instance of high growth in their first ten years of life. Similarly, studies in the US find that only 9% of high-growth firms were less than five years old.

Moreover, it tends to be the larger of high-growth companies that generate most new jobs. For example, Anyadike-Danes et al found that between 2002-5 and 2005-8 fast-growing firms with more than 250 employees increased their average size threefold from just over 1,000 employees on average, to around 3,000 employees three years later. Firms with more than 250 employees therefore accounted for nearly half the jobs created by fast-growing firms in the last economic upturn. By comparison, small high-growth firms employing fewer than 50 staff accounted for only one-fifth of the total created by high-growth companies.

Job creation in high-growth firms by initial employment size	
Employment size	Share of total net job creation (% , 2005-2008)
10-19	14
20-49	18
50-99	10
100-249	13
250+	46

Source: Anyadike-Danes et al, ONS

Sustained fast-growers warm up before starting to sprint

The academic research therefore confirms case-study evidence that many businesses achieve the conditions for sustained fast growth only after an initial phase of slower consolidation. During this preparation phase they assemble the internal resources required for fast growth, and the external arrangements needed to finance it. The emphasis on building up longer-term strategic plans, financing facilities and supplier and customer relationships is likely to make these firms comparatively resilient to external shocks such as a recession.

Internally, the slow-growing 'warm-up' phase typically involves refinement of the product. This in turn leads to clarity over the company's unique selling points, and modification of the process so that output can be increased rapidly without sacrificing quality. The initial growth of sales helps to bring down production costs, so that pricing can be adjusted to promote wider sales.

Feedback from early-adopting customers can be used to adapt product and marketing strategies for the recruitment of new customers. Managerial skills are built up, and company structure adapted from the often informal arrangements associated with start-ups to a more clearly-defined internal organisation. This enables the company to maintain coherence and rapid response to market conditions when growth speeds up, without stifling the initial entrepreneurialism commonly found in excess bureaucracy.

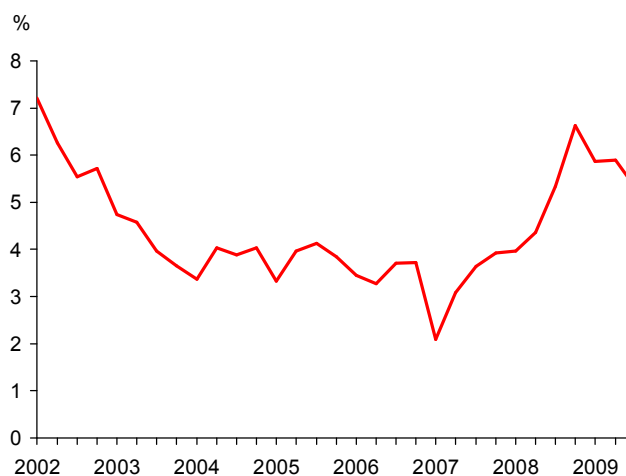
Externally, the period between start-up and commencement of rapid growth may be used to develop the sources of funding that will help sustain that growth. These include not only overdrafts and other loan facilities from banks, and contributions from public or private shareholders, but also trade credit arrangements with principal suppliers, and sometimes purchasing commitments from principal customers. The initial slow-growth phase can also be used to build up internal financial resources through trading profit, which may be an important condition for obtaining affordable external funding.

Entrepreneurship therefore involves not only identifying new market opportunities but also handling the internal managerial challenges that arise in preparing a business for fast, sustained growth. The fulfilment of growth opportunities that gives rise to employment and profit growth can be easily derailed if tensions develop among managers, and if the company fails in its strategy formation, structural development or financial planning. So, the entrepreneur's roles extend to taking charge of these problems and finding solutions, and its absence leads to growth opportunities being lost (St-Jean et al 2008).

Other contributors to fast growth that strongly depend on entrepreneurial input include related product diversification (typically based around an innovation); premium pricing enabled by high quality; early moves into export when domestic demand starts to be exhausted; constant close interchange of information with customers; astute exploitation of external financial sources; rapid reorganisation; and delegation within multi-disciplinary teams.

But it should be emphasised that only a very small proportion of start-up businesses complete the warm-up phase and go on to experience rapid growth. Many exit the industry, and many others plateau at a very small size, reflecting either an inability or the owner's unwillingness to grow. Almost 250,000 new UK businesses were launched in the ten years after 1998. But while roughly a third survived to 2008, only 10% of these had 10 or more employees in 2008. And fewer than 5 per cent had more than 20 employees in 2008" (Anyadike-Danes et al 2009).

UK: Liquidations to new businesses (%)



Source: The Insolvency Service / Companies House

Reaching the critical stage for innovation-based fast growth

Until the 1980s, empirical work tended to suggest that innovation was mostly driven by the youngest and smallest companies (eg Pavitt et al 1987, Acs & Audretsch 1988). This was thought to be because older, larger companies become bureaucratised, insulated from new markets and technological developments, or attached to existing technologies and customer bases that might be upset by product and process change (Christensen 1997).

Larger, more mature companies might still spend heavily on R&D and even accumulate many patents, but their ability or incentive to commercialise these diminished. The finding also chimed with widespread anecdotal evidence that entrepreneurs who achieve a significant innovation only do so once. This is because they either had only one big idea in them or because involvement in a large and growing corporate bureaucracy (or complacency due to arrival of large wealth) stifles their other big ideas.

However, more recent studies suggest there is a range over which the age and size of a firm are positively related to its probability of innovating (eg Baldwin et al 2002, Acs & Audretsch 2005). Over

time, and as they grow towards mid-size, firms acquire the internal capability (technological, human and financial resources) and external capability (technology and material sources, distribution channels, financing arrangements) for a take-off into sustained growth.

As they gain in size and experience, firms can start to generate their own 'inputs' to innovation – such as R&D, market research and technical training – while keeping these closely attuned to market demand, and to the 'customer-facing' employees who are often the best communicators of this. The important role of customers in initiating and guiding innovation has also been often highlighted (eg Von Hippel 1986, Morrison et al 2000). Psion, the UK technology firm, for instance, is asking its customers to adapt its products and then share this knowledge online.

Later, after further growth, internal developments such as bureaucracy or commitment to mature technology work against further innovation. After this point the relationship between a company's age and size and its probability of innovating may become negative; but the point tends not to be reached until the company is some years beyond its start-up, and substantially larger.

Venture capital and private equity

The changing direction of venture capital flows underlines the recognition of mid-size companies' contribution to innovation. Episodes such as the bursting 'dot-com' bubble of 2000-1, and the drop in value of many small biotechnology start-ups shortly afterwards, have made venture capitalists more cautious about concentrating investment on small innovative companies. In biotech, "venture capitalists are much more risk averse these days and prefer investments in companies whose products have the potential to reach the market either faster or at lower cost" (Nickisch et al 2009: 310).

However, mid-size innovators have retained a role in this and other industries because of similar risk-aversion among larger companies, concentrating on products with large-market ('blockbuster') potential and preferring rapid imitation to innovation. Specialist firms can survive by developing products for smaller markets neglected by the main players, seeking new applications for products deserted by the main players, or taking on the early – or late-stage development of compounds originating from larger firms' R&D programmes (Kambhammettu 2007).

Private equity's long-term impact has been examined in recent research. UK firms in private-equity ownership achieved average annual employment growth of 8% in 2003-7, compared to 1% for publicly listed companies, lifting private equity's share of total private-sector employment to 19% (Haarmeyer 2008).

The average UK management buy-out between 1999 and 2004 led to a 26% employment growth after five years and 36% after six, despite an average 2.3% fall in headcount in the first year and a steep rise in output per employee. During the same period, the average buy-in (ie public issuance of shares) experienced a 10.2% loss of employment in the first year after the deal, and despite some subsequent job creation still had 5% fewer employees after five years (Wright et al 2007).

Positive local and regional results

Entrepreneurial firms' direct job creation does not tell the whole story about their impact on employment, since they can also indirectly impact other companies' employment, positively or negatively. A separate study of the Business Structure Database finds that high-growth firms have significant positive spillover effects on the surrounding city and region. These impacts arise from making additional resources such as new technologies and labour skills available to the wider region, as well as furnishing new demand, and prompting surrounding businesses to innovate or restructure for greater competitiveness. Mason et al (2009), for example, find that a 5% point rise in the share of employment accounted for by high-growth firms typically leads to a 1% point increase in employment rates in a city-region.

Van Praag & Versloot (2007) used a comprehensive review of studies which compare high-growth entrepreneurial firms to counterpart firms in order to identify the distinctive contribution of entrepreneurship to job creation, innovation and productivity growth. Drawing on 57 studies, they found that entrepreneurs encourage strong employment creation, productivity growth and product & commercial innovation, and produce important spillovers that affect regional employment rates of all companies. The transmission of these spillovers is promoted by the tendency of smaller companies to build extensive local networks for distribution arrangements and sourcing of specialist inputs that they cannot produce in-house (Howells 2006).

While studies using regional employment data support these findings, they also reveal dynamics to new job creation which highlight the key contribution of new businesses several years after their formation. Upturns in business start-up activity produce "an instantaneous small [positive] effect on employment generation, a mid term negative effect and a long-term positive effect" (van Praag & Versloot 2007).

New firms' creation of additional jobs is quickly followed by a shake-out by other businesses as they react to the increased competition. It is only after several years that the net effect is positive due to increased competitiveness of the surviving firms. So, the jobs initially offered by start-ups may represent displacement rather than net addition; and the net employment gain that later results from their entry is caused by incumbent firms building on their supply and demand and/or reacting to their competitive challenge, as well as by the new entrants continuing to grow.

Developments since 2008

Most of the studies cited in this report use data up to 2008. They therefore cover an unusually long phase in which economies – especially the UK's – were recording relatively steady output and employment growth with low rates of inflation. They do not extend into the more recent phase of recession and job losses following serious financial disruption.

Although it is too early to map in detail the relative performance of different types of business during the recession, the following observations are relevant:

- The 2007-9 'credit crunch', arising from liquidity problems in commercial and investment banks, led to a large-scale withdrawal of credit facilities from business. So although (according to Bank of England 2008) UK companies overall had in 2007 established large contingent credit facilities which would have helped steer them through the recession, some of these were forcibly reduced or

withdrawn during the subsequent banking crisis. In some cases this may have extended to overdrafts used routinely to finance working capital for everyday operations, as well as borrowings directed at investment in fixed capital for expansion.

- Small businesses are generally more reliant on bank finance than larger companies that can also raise capital through bond markets and from shareholders. Expanding businesses are generally more reliant on borrowing than more mature businesses that are not growing as fast. Larger, more mature businesses often have more extensive free cash-flows which in good times are distributed to shareholders, and in bad times can be used to absorb losses in a recession without having to cut investment or shed employment.
- However, the recent research cited earlier suggests that the more dynamic entrepreneurial companies enter their fast-growth phase after building up internal resources, which include a proportionally large store of internal financial resources. This will be especially true of innovative firms which have had difficulty attracting conventional bank, bondholder or creditor support, because of the newness of their activities. Firms which have gone to private equity or venture capital for external funding may also be relatively well resourced to survive a recession: recent research suggests that private equity funds work to a longer time-horizon than stock-market shareholders, and that most of these funds avoided the worst of the 2007-9 credit constraints.
- Longer-term research suggests that radical innovations first appear during phases of recession or slow growth. While recession conditions make it harder to launch a company, they may also increase the supply of entrepreneurship as individuals leave larger companies (or fail to obtain jobs or promotion from them) and set up on their own. British Bankers' Association data suggests that business start-up activity fell by less than 5% in 2008, a substantially shallower drop than was predicted by the pattern in previous recessions. This may partly be because publicly financed support for smaller companies through local and regional development agencies remained relatively steady, helping to offset the reduced availability of credit. But it may also reflect continued availability of private-sector private equity funding – in which case, mid-size business expansions may have shown a similar resilience to smaller business start-ups.

So, while the performance of mid-size during the recession cannot yet be systematically assessed, there are reasons to expect them to have shown greater resilience than smaller innovative companies.

Policy implications

Recognising innovation to be essential for the retention and creation of employment at a time when many traditional industries are downsizing or relocating overseas, successive governments have mobilised support for R&D as an essential contributor to innovation. A growing awareness of the role of smaller firms in commercialising innovations – those arising from R&D in large companies, as well as in the public sector – has also led to substantial public support for small business start-ups. These can be eligible for substantial tax reliefs and business development grants, as well as subsidised advice, infrastructural help, and relief from some of the regulatory requirements imposed on larger companies.

While not rejecting the substantial contribution of start-up firms in bringing innovation to the market place, recent research enabled by improved business data-flow indicates the highly variable return on public investment in business start-ups. While these on balance do generate new employment, many disappear quickly, and most of the survivors stop growing at very low levels of output and employment. Only a small proportion continue growing: and in general it is when they reach mid-size, typically after several years of consolidation, that businesses become capable of the sustained fast growth that disproportionately contributes to output and employment growth.

The implication of this research is that the 'productivity' of public inputs to innovation could be enhanced by focusing more of it on companies that have moved beyond the start-up stage. Assembling resources, developing products and making structural changes will help prepare them for rapid and sustained growth. Private investors have already developed the ability to recognise mid-size companies that are poised for rapid expansion. The important macroeconomic contribution of these companies, revealed by newly-available data, makes a case for public support to be re-targeted in a similar way.

Conclusions

Entrepreneurship provides an important link between the potential for innovation – represented by R&D, patenting activity and workforce skills development – and the realisation of this potential through business growth around new product and process ideas. The UK's weak performance compared to its peers on innovation in part demonstrates an absence of sufficient entrepreneurship to deploy these results in the market place. This therefore shifts policy concern towards regulatory, financial or social barriers that reduce the frequency and freedom of entrepreneurs.

To tackle these barriers successfully, the location of entrepreneurship must be more fully understood. This requires recognition that, although large firm size may place restraints on entrepreneurship, very small firms are not its only habitat, and the innovative role of medium-scale enterprises has often been neglected.

The small start-up firm has a vital role in creating new industries by defying the staid practices and legacy technologies of the old. But many micro-enterprises are not especially innovative, and their impact on output growth and employment generation is blunted by the frequency with which they disappear or plateau at very small size, and the rarity with which they achieve fast, sustained expansion.

Research using newly available data confirms the importance of fast-growing, innovative firms in transforming the economy by applying new technology. But it also shows the most dynamic enterprises to be medium-sized companies that have spent several years laying the foundations for fast growth.

While innovation is often driven by start-up companies, the high attrition rate among them means that much of the public and private capital and assistance channelled into these will often be lost. Resources for business development might generate a higher return if channelled towards the minority of businesses that enter into sustained high growth several years after their foundation, having refined their offer and assembled the resources for expansion.

As well as identifying and assisting mid-size companies that have entered a fast growth phase, policy could be directed at identifying other companies that are several years on from launch and have unexplored potential for fast growth. While the case for assisting start-ups is undeniable, recent research highlights the substantial employment and output growth contribution from entrepreneurial businesses that have moved beyond the start-up phase.

Private equity funds have already discovered the high earnings-growth potential of channelling capital to such companies. With a similar shift of focus, public policy could further unlock their employment and GDP growth potential.

Encouraging entrepreneurship is particularly important in a context where employment in the public sector will be shrinking as the government seeks to restore its finances. The jobs created by entrepreneurs in the new economic upturn will be vital to reducing unemployment.

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