

Entrepreneurial growth versus sustainability issues in small firms.

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Introduction

Over the past two decades, the role of entrepreneurship and innovation in business and economic growth has become increasingly prominent in the competition and economic development policies of developed, emerging and less developed economies. In Europe, this has taken place in the framework of the European Commission's upgraded Lisbon Programme (EC, 2005). The Lisbon Agenda, as it is also called, has the clear aims of both increasing the numbers of entrepreneurial small firms and of raising their potential and actual rates of economic growth. Over the same period, policy responses to increased concern over the sustainability of the world's eco-system in the face of growing volumes of emissions mainly from energy, industrial and transport industries, have also become more powerful. The year 2005 also saw the Kyoto Protocol to the [United Nations Framework Convention on Climate Change](#) (UNFCCC) come into force and the launch of the EU's carbon emission trading systems. Since then, environmental issues and eco-friendly business practices have also increasingly influenced enterprise and innovation policies, as well as wider public discourse. All EU member states, current financial crises notwithstanding, pursue similar policies (DTI, 1998; 2005) as do members of the Organisation for Economic Cooperation and Development (OECD) and many emerging economies (OECD, 2001; 2004; 2005). In developing and emerging economies, where labour costs are generally lower and the main policy emphasis is on reducing barriers to business and growth, current enterprise policies in most sectors are also driven by a desire to improve innovation and productivity in order to compete more effectively and efficiently in the global economy (UN, 2004).

In Europe and elsewhere, growth strategies are strongly linked to the increased adoption and use of information and communications technology (ICT) applications by small and medium enterprises (SME), - those that employ fewer than 250 workers. Initially, these policies appeared to have been working – at least up until the current banking crises, budget

deficits, austerity cuts and revolutionary shocks to the global and local economic systems. Although the objectives of the Lisbon Agenda had to be re-adjusted downwards in 2005 to take into account increasing unemployment, annual sales in Western Europe's ICT sector had doubled to \$1 billion in 2008 (IHS, 2009). Over the same 2002-2008 period, the number of small and medium enterprises (SMEs) in Europe grew by 2.4 million, adding some 9.4 million new jobs to the EU workforce (EC, 2010). In the US, where a weak recovery does appear to be under way, real manufacturing value-added increased by more than 20% from the depths of the recession in 2000 till 2007 (Galston, 2011).

However, there were storm clouds on the horizon. Despite the increase of value-added in manufacturing in the US, employment in the manufacturing sector actually fell 19% from 17.3 million to 13.9 million. By 2008, the recession had begun to bite in Europe (EC, 2010). SME take-up of high-speed broadband, e-business applications and ICT services has not been as swift as policy makers would have liked. The drive for more effective SME use of ICT applications is associated with productivity increases in the US and with the potential for more effective networking and business services in Europe. Increased use of ICT is also associated with 'cleaner' more efficient production and fewer emissions (eWatch, 2008; Environment Agency, 2009; Calogirou, 2010; Carbon Trust, 2011). However, any such gains that have been achieved do not appear to have yet staved off the effects of widespread liquidity squeezes and austerity measures aimed at reducing budget deficits. Furthermore, looking beyond the adverse effects on SME finances and growth, nor do any internal SME productivity and efficiency gains appear to have yet stemmed external increases in noxious emissions or global warming.

Over the same time period, global concentrations of the 'greenhouse gas' carbon dioxide (CO₂) continued to rise steeply. The majority of the world's informed scientific opinion links this directly to human activities related to business growth and the combustion

of fossil fuels like coal, coke and oil (USNAS, 2008). Indeed, the 2000-2009 decade was the warmest ever recorded (Voiland, 2010). The main future entrepreneurial challenges may involve a widening from a narrow focus on innovation, productivity, profits and growth to include addressing issues concerned with immediate survival and longer term sustainability. For example, with respect to very small firms and the self-employed, this implies the need for a higher awareness of *personal carbon quotas* (the maximum quantity of CO₂ each individual may emit into the atmosphere per year without increasing the level of current global emissions) and of the firm's overall 'carbon footprint' (Eid, 2009). Environmental and energy related regulations that affect all firms, including SMEs, are already increasing. As the Carbon Trust (2011) has indicated, many more entrepreneurial opportunities in the future are likely to arise in relation to green challenges.

This paper, makes use of a range of current secondary data from sources such as the UK Office of National Statistics (ONS), the European Union (EU), United Nations (UN) and other multi-lateral agencies to identify the opposing forces associated with, on one hand, business growth, economic development, employment and entrepreneurship and, on the other hand, ecological sustainability and the longer term business and economic environment. Primary data gathered in Britain through the *Quarterly Survey of Small Business in Britain*, is used to identify how these how the contradictory forces impact on SMEs and to identify the types of SME that are likely to be in a position to resolve them, taking into account the effects of firm-size and use of ICT. The paper mainly focuses on how these issues are reflected in the behaviour of small firms in Britain and Europe but the findings have relevance for SMEs and policymakers elsewhere.

SME employment and entrepreneurship

The policy focus on SMEs is understandable .The vast majority (99 per cent) of the 25 million or so firms in Europe are SMEs. These are defined in Europe as those that employ

fewer than 250 people. They account for two-thirds of jobs in the EU and 55% of the total sales turnover (EC, 2010). They make a larger net contribution to the creation of new jobs compared with large firms though the largest SME segments are the self-employed without employees (68 per cent of all firms) and microfirms with less than 10 employees (25 per cent), which are also the slowest growing and suffer higher exit and failure rates (Schorr, 2007). An increasing priority, which is moving higher up the agenda, is the creation of new jobs to counteract rising unemployment. Already a growing problem in most EU member states, unemployment has been exacerbated now by the effects of recent banking and financial crises plus the need to reduce very high national debts and budget deficits.

Indeed, although entrepreneurship models are very context-bound and there is no universally accepted definition or theory of entrepreneurship, the major entrepreneurship theories share a focus on competitiveness and growth. These are linked to the successful exploitation of business opportunities (Kirzner, 1982), many of which now derive from the adoption, creation and diffusion of innovations and new technologies (Schumpeter, 1934). Certainly, the current dominant Schumpeter model of entrepreneurship stresses the importance of competitive edge that entrepreneurs gain from applying different innovations in their pursuit of growth and the opportunities arising from the 'creative destruction' of rivals, their older technologies and their outmoded working practices (Drucker 1985; EC, 2003; Schumpeter 1934; 1942). Other emerging models of business development such as the resource-based view of the firm (Penrose, 1959) and knowledge management ideas of 'core competencies' also focus on innovation-driven growth. However, except in a few cases, the entrepreneur-led model of economic development has not been seriously criticised (Rae, 2010).

In the light of the 'credit crunch' of 2007 and the related series of economic crises which followed with their exposure of widespread unsustainable growth and reckless banking

practices, some questioning of current economic growth models might have been expected. Instead, major UK environmental bodies like the Carbon Trust (2011) point to new business opportunities of £112 billion in the UK and £3.2 trillion worldwide created by consumer pro-green attitudes and the need to comply with recent environmental practices regulations. With unemployment in the public and many traditional sectors on the rise, this is welcome but hardly challenges the current economic system. Indeed, after current short and mid term opportunities have been exhausted, competition for 'green' jobs may only postpone the underlying need to plot paths between the potentially conflicting pressures of business growth and sustainability. For longer term and more radical solutions policy makers may need to turn to the noted flexibility and innovativeness of entrepreneurs themselves.

Most SMEs are very small and under-resourced, employing just themselves or only a few other people. They tend to be growth averse, suffer low productivity and are non-entrepreneurial no matter what definition is applied. Indeed, because of their high rates of activity and sheer numbers, the SMEs sector overall is responsible for two-thirds of the total environmental impact in Europe, including greenhouse gas emissions (Calogirou *et al.* 2010). These smaller microfirms with less than 10 employees are also least likely to be aware of environmental legislation and regulation and least likely to have introduced energy-saving and waste-management systems into their businesses (EA, 2009).

At the other end of the SME scale, though, there is growing interest in high impact, fast growth, very innovative and, usually, more experienced and larger SMEs (Acs & Mueller, 2008; Acs, Parsons & Tracy, 2008; Henrekson & Johansson, 2010) which are more innovative but also much fewer in absolute numbers. It is from some of these high-performing 'gazelles', as they are now often called, that the future's new and pioneering low energy or even carbon-absorbent actions may come. In Britain, analysis of some 1.5 million firms conducted by the large business database and services firm Experian (2011) confirms this

approach and suggests that economic change and development policies should not focus on new start-ups and today's growth-sectors but on the existing high-growth medium-sized SMEs irrespective of sector. The EU's review of the Lisbon Programme has little room for doubting current development models but did concede that issues other than entrepreneur-driven growth are also important, acknowledging that '...most SMEs are committed to corporate social responsibility, which allows them to improve their performance and competitiveness while having a positive impact on the local community and the environment.' (EC, 2005 p. 3). If this is not exactly a ringing endorsement of the need to address green and sustainability issues in SMEs, it reflects the start of a change in approach in linking these issues to local economic development as part of the SME role in the future.

Entrepreneurship and environmental issues

The concept of entrepreneurship can trace its roots back to Richard Cantillon (1756), an Irishman living in France who saw the entrepreneur's role as that of a risk-taker and facilitator of deals and transactions by taking (*prendre* in French), at a price, goods or services between (*entre*) two parties. In one guise or other, entrepreneurs had been around a long time before that and have been going strong ever since. Within fifty years of the term being coined, however, concerns that many resources are finite and that there may be natural limits to growth were already being raised by Thomas Malthus (1798) in relation to growth and food-production constraints caused by over-population. These concerns, however, made little impact on the unbridled force of industrialisation and early stage capitalism, even though public concern over the effects of the 'dark satanic mills' was also growing and producing occasional social reforms.

As industrial capital ceded more and more ground to financial capital and the services industries displaced heavy industry in the developed economies, further swelling the ranks of the middle classes, champions of the environmental causes became more vociferous. In the 1970s, two very influential publications - *Limits to Growth* (Meadows et al, 1972) and *Small*

is Beautiful (Schumacher, 1973) – extended the neo-Malthusian analysis to all finite resources, especially in the sphere of energy, and attacked the sustainability of current economic models. Politically, this has given impetus to increasingly significant ‘green’ movements throughout the world and has fed into vital debates on global warming and weather-change. However, when presented with the spectre and the reality of mass unemployment, environmental initiatives tend to get sidelined. Energy efficient projects tend not to be large-scale employers.

Consequently, there remains large unresolved issues of how policies designed to promote growth and a significant numbers of new active businesses and employment, which are associated with increases in energy consumption and harmful ‘greenhouse’ gas emissions, can be reconciled with goals and policies aimed at reducing carbon emissions and creating sustainable economies. Not surprisingly, the increasingly large ICT industry strongly advocates more use of energy-saving ICT applications and systems. Indeed, large programmes to improve the efficiency and costs of renewable energy sources are able to do so mainly because of their applications of ICT solutions. This is an important part of the Lisbon Agenda and later EU policies and programmes. A number of EC programmes have tried to encourage tele-working and other forms of e-working to provide the flexible new jobs and the ‘paperless’ offices that may be required in the future. There have even been a number of attempts to introduce electronic ‘virtual’ money.

However, there are many more studies that have revealed ICT skills shortages among SMEs (eWatch, 2008). ICT solutions to SME problems or challenges are often not immediately successful because of very strong firm-size effects on the adoption and use of more advanced ICT applications (OECD, 2004;.EC, 2008; e-Watch 2009). The take up of most SME policy initiatives in many areas generally show a familiar pattern of inverse relationship with size of firms, especially when measured by number of employees. With

respect to the adoption of ICT applications and, incidentally, the use of environmental management practices and systems, the rates of adoption among the very small microfirms and single self-employed is significantly lower than those in the small firm sector which again is significantly lower than among medium or large sized firms. The main reason for this is lack of resources, especially time, in the smallest organisations and a related lack of knowledge of modern competences and skills. In technical terms, the smaller the organisation the lower appears to be its absorptive capacity - the prior or existing experience and knowledge that enables the small firm to understand and exploit the newly introduced process or technology (Cohen and Levinthal, 1990). As this paper will show, the effects of firm-size limits on absorptive capacity have to be taken into account when determining how or whether ICT applications be regarded as 'green' or 'clean' bridges between growth and sustainability. Thus the focus of this paper is on the entrepreneurial small firms in Britain which are responding to these issues and managing the apparent contradictions between entrepreneurial growth-oriented business models and increasing pressures on entrepreneurs to develop successful ecologically sustainable businesses..

Methodology

These key issues are explored through an analysis of recent relevant secondary data in a number of mainly policy related studies and of primary data from the findings of recent national quarterly surveys of small UK firm owners conducted regularly by the Open University Business School (OUBS) since 1984. Each quarter more than 800 microfirm and small business owners from across Britain complete performance measurement indicators, rate their firms on a 10-point entrepreneurship scale, and respond to questions that monitor small firm management and strategic issues. Roughly 75% of each quarter's 800+ respondents are drawn from a structured telephone sample that reflects the sector distributions of small firms in Britain that have annual sales of £50K - £1 million. One quarter are online

respondents from the OUBS database of SMEs which functions like a panel in that many of these respondents respond to successive surveys thus providing regular longitudinal data. There are also questions on a special topic each quarter, including the SME owner-mangers’:

- growth motivation and targets (2009 Q2 - 848 respondents);
- use of ICT applications (2010 Q2 - 833 respondents);
- carbon footprint and sustainability issues (2010 Q4 - 819 respondents).

The findings and re-analysis of the data from these surveys were used to determine the links between SME:

- size of firm effects (as measured by workforce size);
- self-rated entrepreneurship propensity of the firm;
- projected and actual growth objectives and performance;
- the use of ICT applications to substitute for labour and other operating costs;
- ecological awareness, including the monitoring of carbon emissions;

Findings

The Quarterly Surveys have been monitoring small and medium enterprise (SME) growth intentions regularly since 1991. However, it is worth noting that these and other similar surveys conducted at UK, EU and wider levels often find that only a minority of SMEs express an intention to grow or set themselves growth targets. Table 1 shows the changes in growth-orientation among SMEs in the UK 1991 – 2009, measured as a growth-orientation balance (percentage positive on growth less percentage negative).

Table 1. SME growth intentions and performance 1991 – 2009 (column percentages)

	1991 Q3	1995 Q1	1996 Q4	1999 Q4	2004 Q1	2005 Q1	2006 Q2	2009 Q2
Growth-oriented	37	62	33	41	48	34	54	45
Exit/merge	25	9	30	36	23	20	12	8
Growth averse	38	30	37	23	29	44	29	47
Growth balance	-1	32	-4	18	19	-10	25	-2
Sample size (n)	1719	2517	753	1121	808	652	638	848

Source: Quarterly Survey of Small Business in Britain 12.4; 15.4; 18.3; 20.1;21.1; 22.2; 25.2.

The trends across time reveal the effects on SMEs of the external economy and business climate. In 2009, the effects of the recession are clear. In terms of disruption to trade

and supplies and sudden reduction of economic activity, the external shock of a profound recession resembles some of the effects of severe environmental disasters (such as the *tsunamis*, volcanic ash and violent storms experienced over the past year or so). There has been a sharp 18 per cent increase in growth-averse firms since before the recession in 2006 and a less dramatic drop (on balance +9 per cent) in growth-oriented owner-managers. The recession seems to have had a dampening effect on the entrepreneurial firms that wanted to expand significantly. The sales balances of these potential gazelles fell from 11% in 2006 to 8% in 2009 though this was mild compared with the overall 2009Q3 negative sales balance of -29% (the lowest point up in the 26 year history of these quarterly surveys). Generally, growth-oriented firms have been more successful in their sales performance than other small firms and have maintained a positive sales balance (+12%) even in the depths of recession.

This suggests that entrepreneurial growth-oriented firms adopt quite different business strategies and are likely to be better resourced. To examine what distinguishes these entrepreneurial firms in more details, the surveys have a self-rating 10-point entrepreneurial scale which reveals a number of significant differences in business strategies between business owners who rate their firms as high or low on the entrepreneurship scale (Table 2).

Table 2. Entrepreneurial differences in recession strategies 2010 Q3 (column %)

Strategy	Low entrepreneur.	High entrepreneur.	All
Speed late payments	27	52	42
Reduce overheads	27	39	35
Cut personal pay	32	34	30
New markets/business	9	41	28
Cut marginal activities	12	29	27
Freeze staff pay	23	24	27
Increase marketing	12	35	23
Cut staff	17	30	26
Cut marketing	18	17	20
Cut R&D	10	9	10
Invest in ICT to cut costs	2	13	9
Total sample size (n)	113	178	832

Source: Quarterly Survey of Small Business in Britain 26.3

The most obvious point to note is that entrepreneurial businesses are much more active in all counter-recession activities and strategies. While they are twice as likely to take a

personal cut in earnings and to intensify the pressure on slow payments, the entrepreneurial firms also appear to be more likely to confront the recession head on in a very Schumpeterian way. They are much more likely to move into new markets and new lines of business while cutting their own current activities that have become marginal. The entrepreneurial firms are also much more likely to introduce new ICT applications in order to cut their costs. They are likely to have a similar pro-active and open approach in their strategies for dealing with environmental challenges. To examine the level of resources effects, firm-size as measured by the number of full-time equivalent employees was used as the preferred proxy of organisational size and complexity. Firms with more specialisation of labour and more key competences are able to identify and exploit more opportunities than smaller firms, as the findings in Table 3 show.

Table 3. Firm-size differences and recession strategies 2010 Q3 (column %)

Strategy	Sole trader	Micro I (<5)	Micro II (5 – 9)	Small (10 – 19)	Medium (20 +)	All
Speed late payments	34	35	37	50	49	42
Reduce overheads	22	33	36	44	43	35
Cut personal pay	43	36	39	37	23	30
New markets/business	24	23	29	36	42	28
Cut marginal activities	24	19	22	29	19	27
Freeze staff pay	7	23	29	37	42	27
Increase marketing	15	19	23	33	35	23
Cut staff	9	25	27	35	32	26
Cut marketing	13	22	19	22	16	20
Cut R&D	4	9	10	13	11	10
Invest in ICT to cut costs	3	7	7	13	18	9
Total sample size (n)	68	326	233	124	74	832

Source: Quarterly Survey of Small Business in Britain 26.3

Speeding up late payments and reducing overheads costs is clearly much easier for firms big enough to have administrative systems and backup facilities to support regular invoicing and price comparisons between potential suppliers. Few microfirms and even fewer self-employed sole traders have such resources. A similar point could be made about support for increased marketing and activities involved in trying to move into new markets. Where there is an interesting effect of firm-size which seems to be in addition to any entrepreneurship effect is in the greater use of ICT applications to save labour and costs (and,

by implication, emissions). This observation was confirmed in the survey for the first quarter of 2011, which looked at ICT usage by SMEs (including awareness and use of cloud computing and smartphones). The most obvious feature of the findings in the ICT survey (reported below in Tables 4) and in the recession strategies as reported above, is how much more active are the small and medium firms (more than 10 employees) than other SMEs. And, how even more active and wider ranging the entrepreneurial firms are compared with low entrepreneurial firms. Table 4 contrasts high and low entrepreneurship firms with respect to their adoption and use of different ICT applications.

Table 4. Entrepreneurial differences and ICT adoption 2011 Q1 (column %)

ICT activities	Low entrepreneur.	High entrepreneur	All
Create/update website	27	62	44
New hardware	31	49	37
Update existing software	28	45	36
Update existing hardware	23	33	26
Use social media	13	39	22
Install faster broadband	17	30	19
Use new smartphones	7	33	17
New business software	9	22	13
Use cloud-computing	2	15	8
<i>No investments planned</i>	41	20	30
Total sample size (n)	150	120	826

Source: Quarterly Survey of Small Business in Britain 27.1

More sophisticated and effective use of business websites by active SMEs has grown over the past decade. Clearly, with the use of smartphones and very high speed broadband which can now be easily accessed by mobile technologies means that the scope not only for substituting technology for labour has increased but also the nature of work in many jobs can be organised to involve far less travel and to absorb far less energy. This has the potential to increase business efficiency plus thus reduce emissions significantly. Also, less entrepreneurial firms are twice as unlikely to be investing in ICT applications yet even a majority of these firms do intend to invest when required. Again, the conflict between green and entrepreneurial may be more apparent than real. Indeed, the survey for the last quarter of 2010 explored SME response to environmental issues and found that just under 30% of UK

small firms reported spending something on their environmental impact. Table 5 shows this was particularly high for the medium firms with 20 or more employees, as was the spending on ICT applications.

Table 5. Firm-size differences spend on ICT and Environment 2010 Q3; 2011 Q1 (column %)

Strategy	Sole trader	Micro I (<5)	Micro II (5 – 9)	Small (10 – 19)	Medium (20 +)	All
Create/update website	25	39	50	53	55	44
New hardware	31	32	37	38	53	37
Update existing software	21	34	36	44	49	36
Update existing hardware	22	23	28	32	43	27
Use social media	12	17	25	26	33	22
Install faster broadband	19	15	19	22	29	19
Use new smartphones	14	16	17	15	29	17
New business software	5	10	14	16	45	13
Use cloud-computing	5	9	7	8	11	8
<i>Spend on environment</i>	<i>19</i>	<i>21</i>	<i>31</i>	<i>37</i>	<i>45</i>	<i>29</i>
Total sample size (n)	81	313	227	117	80	826

Source: Quarterly Survey of Small Business in Britain 26.3

The strong firm-size effects were very clear, with almost half (45%) of medium firms paying out costs or investment in equipment to manage the impact of their business on the environment (mainly to reduce costs or because of the entrepreneur's own personal commitment to green issues). This compared with just 20% of the very small sole-traders and microfirms. Indeed, if Britain's small firms are to comply or to participate in carbon emission (greenhouse gas) trading schemes in order to offset their costs by selling their emissions credits to larger polluting organisations, their first step must be to measure their own carbon footprints. The vast majority of SMEs (80%) are either ignorant of this or have no desire to find out how to measure their carbon footprints. However, the larger and more entrepreneurial firms have been more responsive. More than one third (37%) of entrepreneurial firms have invested in equipment to manage the impact of their business on the environment compared with only 16% of firms that rated themselves as low in entrepreneurship. Table 6 shows that even that low level of investment may be reluctant, prompted mainly by the requirement to comply with local or national government regulations.

Table 6. Entrepreneurial motivational differences in green-activities 2010 Q4 (column %)

Motive for green activities	Low entrepreneur.	High entrepreneur	All
Save energy/costs	33	46	36
Owner's personal commitment	14	20	32
Government regulations	43	17	20
Firm's reputation	0	13	9
Total sample size (n)	21	69	241
<i>Measure carbon footprint</i>	<i>4</i>	<i>16</i>	<i>12</i>

Source: Quarterly Survey of Small Business in Britain 26.3

Reassuringly for those seeking market-based solutions, the high entrepreneurial firms do seem to be driven by commercial cost-saving motives of saving costs, However, their firm's reputation and their own personal commitment to ecological and green issues also feature in their motivation. Overall, personal commitment is a strong driver but mostly among SMEs with above average but not top levels of entrepreneurship. It may be that these firms have already achieved an acceptable trade-off between an entrepreneurial drive for growth and the use of sustainable business practices.

Conclusions

These patterns of behaviour with respect to green issues among the entrepreneurial firms are consistent with their responses to other key business behaviour and development issues as reported above. The firm-size effects on measuring the carbon footprints is even more evident with only 10% of sole-traders and small microfirms measuring emissions compared with almost one quarter of medium-sized firms, a finding that is also consistent with the 'gazelle' approach to enterprise development (Acs, Parsons & Tracy, 2008; Henrekson & Johansson, 2010). This suggests that the larger entrepreneurial SMEs, the gazelles, are more likely to be responding to green issues, making more creative use of ICT and seeking sustainable entrepreneurial solutions. The findings from these recent SME quarterly surveys confirm significant differences between growth-oriented entrepreneurial SMEs and non-entrepreneurial firms in terms of objectives, perceptions of problems and

performance. They also confirm strong size and industry effects with firms that employ more than 20 people being more likely to:

- rate themselves as entrepreneurial;
- set growth targets for their firms;
- Achieve growth in sales (despite economic climate);
- Make wider and more intense use of ICT applications;
- Monitor and invest more in managing green issues (including measuring their own carbon footprint).

The move out of marginal activities plus the cut-back in research and development (R&D) as a response to the recession is not very entrepreneurial but it does suggest a reduction in human activity (along with the cut in overheads and energy use). This is compatible with a reduction in emissions and smaller carbon footprints for those SMEs that do reduce their activities. Interestingly, it is the above average but not top entrepreneurs (self-ranked 6-7 on the entrepreneurship scale) who seek to reduce their activities in this way. These are the same ones who display the strongest personal commitment to finding sustainable solutions to green challenges. Furthermore, there is a much higher likelihood among the medium firms with 20 or more employees to use ICT applications to reduce their human activities and that these small and medium firms seem to be more prepared to cut staff. In a recession, this is clearly bad for efforts to reduce unemployment (and for the UK government's avowed policy to replace public sector staff cuts with jobs from SMEs in the private sector). It suggests, however, that there may not be such a strong clash between the green agenda and entrepreneurship, especially when the renowned flexibility of entrepreneurship is taken into account. Indeed, the larger and more entrepreneurial small firms are also more likely to have invested in equipment to help them manage their impact on the environment and to make

more use of ICT (including e-business applications such as paperless invoicing and e-payments).

Their main motivation reflects both the owners' personal commitment to address green issues and a practical desire to save costs (also a key anti-recessionary strategy). Their main source of information about sustainability issues and solutions are energy and equipment suppliers (29%), business associations (28%), and government services (24%). Generally in these surveys, the more active entrepreneurial growth-oriented SMEs tend to be a bit ambivalent about the use of government sources of information. In this case, perhaps because of the growing body of environment and sustainability regulations and government funded reports, there does seem to be a stronger role for a government in providing good quality advice and information on the cost saving and promotional aspects of adopting good sustainability practices. Bearing in mind that the evidence suggests that it is the larger small and medium firms (say, 10+ employees) that are most positive about adopting a 'green entrepreneurship' route, there also appears to be a strong role that chambers of commerce, trade associations and other similar bodies could play in raising SME awareness of how to measure and reduce personal and small firm carbon emissions while improving overall business efficiency. There are already some signs that firms that adopted a green sustainability framework were better able to survive the recession (Eid, 2009). Effectively drawing this to the attention of SME owner-mangers would be a very important step towards not only resolving entrepreneurship vs. sustainability tensions but also addressing wider issues concerning ethical aspects of green governance and the regulation of consumption that takes into account informed SME perspectives and positions.

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