

**LIQUIDITY CONSTRAINTS UPON START-UPS WITH NEW PRODUCTS: A
STUDY OF REASONS FOR FAILING TO ACCESS FINANCE USING GLOBAL
ENTREPRENEURSHIP MONITOR (GEM, 2005) UK DATA ***

By

Brooksbank, D. J. Jones-Evans, D. Kwong, C. C. Y. Thompson, P. and

Ullah, F.*

National Entrepreneurship Observatory of Wales (NEO)

Business School

The University of Glamorgan

Treforest, Pontypridd,

CF37 1DL

United Kingdom

E-mail: fullah@glam.ac.uk

Tel: + 44 (0)1443 483 370

Fax: + 44 (0)1443 483 650

* Corresponding author

**Although data used in this work are collected by the GEM consortium, their analysis and interpretation are the sole responsibility of the authors.*

Liquidity Constraints upon Start-ups with New Products: A Study of Reasons for Failing to Access Finance using GEM UK (2005) data

Abstract

The possibility of differing reasons for finding finance between innovative and non-innovative start-ups is examined using data from the Global Entrepreneurship Monitor (GEM) for the UK. A sample of 140 start-ups who reported they had problems in accessing one or more sources of funding was subdivided into start-ups intending to produce new products, and those producing established products. The sources of finance used by, and refused access to, by these groups of start-ups were examined, along with the reasons for failing to access sources of funding. It appears that those attempting to provide a new good or service often *rush in* without full preparation, more often suggesting that the reason for failing to access finance was due to *not being investor ready* and having *inadequacies in the business plan* than those intending to sell established products. The implication being that in order to encourage innovation it is necessary for policy makers to ensure that innovative entrepreneurs are provided with the business skills required to ensure that their ideas make it to the market place, rather than being aborted due to a lack of finance.

Keywords: Innovation, start-up, finance, Venture Capital, Business Angels, Entrepreneurs

1. Introduction

The importance of small and medium sized enterprises (SMEs) and particularly the Technology-based small firms (TBSFs) has been increasingly recognised in replacing the old industrial base of the UK and other industrial economies of the world. The UK which was once known as the workshop of Europe has been going through a major creative destruction and economic reshuffle in the past forty years. Consequently, this economic restructuring and renewal has resulted into the emergence of unprecedented new and novel business ideas. As a result we have seen a major upsurge in the creation of SMEs and TBSFs in the UK and elsewhere.¹ They are the source of most new jobs and make significant contributions to innovation and high technology employment. They are also crucial for regional development and social integration. Nevertheless, less than one-half of small firm start-ups survive for more than five years, and only a fraction develop into high performance firms (OECD, 2000). Whereas large firms may find finance relatively easier to come by, it is the SMEs who are faced with the greater financing constraints, that are the firms free of the organisational rigidities associated with larger firms, which thwart innovation (Tourigny and Le, 2004). Financiers such as banks, venture capitalists and business angels justify their risk-averse behaviour by the higher failure rates among small firms.

In spite of this confusion and misunderstanding among the small business starters and existing owners, the UK central and regional governments, financiers and development agencies are attempting to overcome the funding gap. This public interest in small firms funding gap is not a recent phenomenon. Bolton (1971) and Wilson (1979) presented their reports on finance for small firms. Bolton (1971) reported that there was no institutional deficiency in the financial markets for small firms in the UK and hence did not justify government intervention in the finance markets for small firms.

The Wilson (1979) report did not find any evidence that suggested a general shortage of finance for small firms in the UK but suggested that some small start-up firms might experience problems in raising amounts of up to £10,000 and small development firms may find it difficult to raise finance in the range of £15,000 to £150,000. All these public enquiries took a holistic approach rather than focusing in more detail on a particular group of the SMEs population. The first public enquiry that is of direct relevance to the financing of innovative

high growth firms in the UK is that of the Advisory Council on Science and Technology (ACOST) in 1990. This enquiry focused on TBSFs finance and the financial constraints that these firms encounter at earlier critical stages of development. Due to the higher risk associated with TBSFs and difficulties of assessing technology and innovativeness, this enquiry found that institutional investors particularly banks, were hesitant to provide financial assistance. In this paper we are concerned specifically with the financing environment for small innovative entrepreneurs who are either (a) introducing a completely or partially new product (b) process innovation with new production technologies being used.

In either case it is envisaged that entrepreneurs with new business ideas encounter many problems particularly in raising finance at the earlier stages of their business development. Literature review in section 2 suggests that these funding problems are more acute if the new product or service is based on an innovative idea emanating from academic or scientific research undertaken in the universities or other research organisations.

2. Literature overview

In its simplest form the term innovation means that those entrepreneurs/firms which introduce a new idea into the marketplace in the form of a new product or service or an improvement of an organization or process are called innovative entrepreneurs/firms. Koberg, Uhlenbruck and Sarason (1996) suggest that small firms due to their informal structure are more innovative than the large firms with formal and mature structure. In this context our sample firms have either introduced completely new products/service or alternatively made use of new production technology.

The development of innovative products/services is often constrained by the lack of finance, particularly in the case of growing technology-based small firms (Pissarides, 1999; Harrison and Mason, 2004). The majority of small firms finance usually comes from family sources (Bates, 1997), but the traditional sources of finance from family and friends, business angels and banks are often inadequate to fund the new innovative products at the early stages of business development. Although small firms have the comparative advantage of dynamism and flexibility than large firms, they are constrained in securing funds for the growth of their innovative products/services. This is more acute for TBSFs than the conventional SMEs, which generally stay small. High growth firms need to grow in order to respond to the changing environment around them. This involves developing new innovative products and diversifying the existing ones to follow the market trends, and it is these processes that may be hindered by the lack of finance at early stages of business development.

Consensus suggests that access to appropriate finance at the appropriate time (particularly at the earlier stages) of business development is considered as a key element in the successful development of a new business idea. This is specifically true if the firm is operating in the high technology sectors (Westhead and Storey, 1997).

Although other arguments that have been put forward one of the main explanations for small firms funding gap is that there exists an agency conflict, where the entrepreneurs and financiers interact, but with conflicting interests (Jensen and Meckling, 1976; Myers and Majluf, 1984; Amit, Glosten and Muller (1990); Chan, Seigel and Thakor, 1990; Admati and Pfleiderer, 1994; Cable and Shane, 1997; Bergemann and Hedge, 1998; Hart and Moore, 1998). To explain this situation, Admati and Pfleiderer (1994), and Hart and Moore (1998) outline an ideal financial contracting problem which involves an entrepreneur with an idea, but lacking capital to put the idea into practice. Admati and Pfleiderer (1994) also assume that the project goes through certain stages of development, and at each stage the project should be assessed, and decisions made on whether the project is feasible enough to go ahead, or should be abandoned. If the project is viable and is continued, the additional amount of capital required must also be determined. It is also assumed that at each stage the

entrepreneur observes private information about the profitability of the project and that this information is not observed by outside investors and therefore cannot be observed at the outset. This asymmetry of information between entrepreneurs and the finance providers consequently give rise to other aspects of financing problems such as moral hazard and adverse selection.² Empirical studies including; Himmelberg and Petersen (1994), Berger and Udell (1998), Wright and Robbie (1998), Jordan, Lowe and Taylor (1998) confirm that informational asymmetry is the most important factor in constraining small business finance, and this is more acute in the case of TBSFs.

Closing this information gap is difficult given the cost of information relating to small firms, which means the information gap and resultant funding gap remain (Stiglitz and Weiss, 1981). Jensen and Meckling (1976) suggest that it is generally impossible to expect entrepreneurs to be honest at zero cost. Although the involvement of external financiers within a firm such as venture capital firms (VCs) will make accessing additional funds easier as the level of moral hazard from the agency problem is reduced (Dewatripont and Tirole, 1994), as such venture capital financing is one of the most important sources of finance for technology-based start-ups particularly in the US (Bergemann and Hedge, 1998). Cable and Shane (1997) suggest that greater co-operation between entrepreneurs and VCs is indispensable for successful business growth.

The small firms finance problems is not just due to the shortage of funds. Governments in many countries are quite often trying to increase the supply of funds, but it is suggested that in addition to the supply-side financial constraints there are demand-side financial constraints (Cressey and Oloffson, 1997). A supply-side financial constraint constitutes a capital market imperfection that leads to a socially incorrect supply of funds to projects, or an incorrect interest rate charged on funds. On the other hand a demand-side financial constraint is a capital market imperfection in which the performance of a firm is adversely affected by a factor internal to the firm. For example if a firm's owner wants to grow the firm but the only way to grow is to relinquish equity and he/she do not wish to do so. In such a situation they suggest the firm is finance constrained due to demand-side factors.

In terms of what is the most appropriate source of finance for SMEs and in particular TBSFs, Berger and Udell (1998) suggest that in a firm's life cycle different financial structures are optimal at different points, so that capital structures change with firm size and age. Private markets tend to provide finance to informationally opaque small businesses, while public markets fund businesses which are large and more transparent. Berger and Udell (1998), suggest that financial intermediaries, such as VCs, play an important role in screening, contracting with, and monitoring small businesses, which helps reduce information opacity. VCs collect information about the business, potential markets, collateral, and the management team of small businesses. Small businesses remain informationally opaque even after some experience is gained as compared to large firms because their activities are largely invisible. TBSFs which carry high risk but exhibit high growth quite often receive external equity (venture finance) while those which are low risk and low growth, in other words, conventional SMEs, more often obtain external debt (bank finance). Venture finance becomes available in most cases after firms receive one or two rounds of angel finance while bank finance often comes after firms assets becomes more tangible and could be offered as collateral (Berger and Udell, 1998).³ Berger and Udell (1998) suggest that moral hazard problems occur when larger amounts of external finance are needed relative to internal finance.⁴ To keep control of the business, entrepreneurs may choose external debt and to share risk they may choose external equity. Himmelberg and Petersen (1994) suggest there is a 'pecking order' regarding the most sought after sources of finance.

According to Pecking Order Hypothesis (POH) firms exhaust internal sources first (personal savings, family and friends and retained earnings) followed by debt finance

(usually from banks) and finally equity or risk capital (Venture Capital finance). However, this pattern does not hold true for TBSFs, as studies of TBSFs find a greater preference for equity finance, and little desire for debt finance, due to a mix of greater perceived informational asymmetries on the part of banks, than equity investors, and because of different motivations of owners (Roberts, 1991; Hogan and Hutson, 2005). For innovative products, or new ideas, which are typically characterised by information opacity, VC finance is considered to be the most appropriate (Gompers, 1995; Wright and Robbie, 1998).⁵ However, Landstrom (1993) suggests that this ideal source of finance seems to be short in many countries.⁶ MacMillan, Siegel and Narasimha (1985), and Muzyka, Birley and Leleux (1996) discuss the use of different criteria by VCs to select projects for financing. MacMillan, Siegel and Narasimha (1985) find from a survey of 100 VCs that the most frequently used criterion is the quality of the entrepreneur, with five of the top ten most important criteria relating to the entrepreneur's experience and personality. They question why there is so much emphasis on the business plan by VCs as a business plan hardly reflects the characteristics of an entrepreneur. Muzyka, Birley and Leleux (1996) find that VCs prefer to select an opportunity that includes a good management team, reasonable financial and product-market characteristics.

Previous studies show that it appears that the greatest constraint on the supply side of the financing of SMEs is the informational asymmetry that exists between the financier and the entrepreneur. This problem is greater when the product in question is new and unproven and therefore it would be expected that the firms within this study attempting to sell completely new products, will have greater difficulty in convincing external sources of finance of the merits of their start-ups' opportunities. On the demand side firms constrain themselves by appearing to be unwilling to access debt financing, which would suggest that those firms with innovative products in our sample will show a preference for equity finance either from venture capital firms or business angels.

3. Data and Research Methodology

This paper examines the reasons that nascent entrepreneurs identify for failing to access funding comparing those introducing *new products* into the market with those who attempt to provide *established goods and services*.⁷ The data used in this study is from the GEM (2005) survey for the UK which was collected through telephone interviews during spring and early summer of 2005 using a standardised questionnaire. It is a large sample with a total of 31,649 randomly selected individuals being questioned on their involvement or lack of involvement in enterprise activities. This sample includes a total of 602 nascent entrepreneurs (individuals actively involved in a business start-up which has not paid wages or made profits for three or more consecutive months). Of these nascent entrepreneurs 140 start-ups who had reported that they had previously had problems in accessing one or more sources of funding were identified and are used in this study. In order to provide a simple indication of whether start-ups are providing an innovative drive to the economy, respondents were asked whether they intended to sell new or existing products to the market and how long the production technology they intended to use had been available for. From the sample 20 start-ups suggested they will provide a good or service completely new to their customers (innovative product) and 46 will provide goods or services that are new to some of their customers (partially new product). The sample was also classified according to whether the start-ups intended to use production technology that had been available for (a) less than one year (new technology), (b) between one and five years (partially new technology) and (c) more than five years (existing technology).

The nascent entrepreneurs were asked in the GEM survey a number of questions relating to the types of finance they have utilised but also those that they had attempted to

access but failed. Data for successful (the ‘seek-and-succeed’ rate) and unsuccessful attempts (the ‘seek-and-fail’ rate) made on each type of external finance source is available in the GEM UK dataset. Two extra variables are calculated for this study. They are (a) the attempt rate and (b) the rejection rate. The attempt rate is the number of firms attempting to use each source of finance calculated by adding the rates of successful and unsuccessful attempts in gaining finance minus double counting. The rejection rate is simply the percentage of attempts which are unsuccessful. In addition, reason for failure to access finance is also recorded if available.

4. Characteristics of Innovative Entrepreneurs

New and existing product entrepreneurs have distinctively different motives for starting businesses (Table 1). When compared to *existing product* entrepreneurs *innovative product* and *partially new product* entrepreneurs are more likely to start a business due to *the challenge of leading their own businesses* (71% for new, 77% for partially new and 64% for old) and *to pursue an idea innovation or hobby* (61.3% for new, 65.2% for partially new and 47.2% for old). This corroborates Hogan and Hutson (2005) who finds that the main motivation for TBSF start-ups is to introduce new ideas about products or services. *Innovative product* entrepreneurs are also less likely to start their business due to *dissatisfaction in their previous job* (16% for new and 27% for old). This suggests that *innovative product* entrepreneurs are passionately attracted to entrepreneurship rather than being pushed into it by necessity.

Table 1 Motivation for starting a business by product innovation*

		Innovative	Partially new	Existing	Total
The challenge of leading own business	Number	44	104	161	309
	%	71.0	77.0	63.9	68.8
To pursue an idea, innovation or hobby	Number	38	88	119	245
	%	61.3	65.2	47.2	54.6
Dissatisfied in current job	Number	10	38	68	116
	%	15.9	28.1	26.9	25.7
Have difficulty finding paid employment	Number	4	13	17	34
	%	6.3	9.6	6.7	7.6
None of these	Number	3	7	32	42
	%	4.8	5.2	12.6	9.3

* Respondents are allowed to select more than one motivation, and therefore percentages do not sum to one hundred.

As *innovative product* entrepreneurs are often drawn into entrepreneurship as a result of inspiration rather than necessity, they are usually more ambitious than *existing product* entrepreneurs. *Innovative product* entrepreneurs tend to require a larger amount of start up funds when compared with *partially new product* and *existing product* entrepreneurs. The median average funds required for starting-up a business is £20,000 for *innovative product*, £13,000 for *partially new product* and £10,000 for *existing product*.⁸ However, the average median amount of investment that *innovative product* entrepreneurs invested personally was only £10,000, which means that 50% of the funds required for the business start-up needs to be acquired externally. On the other hand the average median of personal start-up investment for *existing product* entrepreneurs is £9,300. Although this is marginally smaller than the amount *innovative product* entrepreneurs invested, this covered 93% of the total fund required to start a business. Thus the funding gap for *existing product* entrepreneurs is arguably smaller.

Innovative product entrepreneurs also have high expectations. The average median *innovative product* entrepreneur expects his/her annual turnover to rise from £60,000 to

£250,000 within three years. This represents an increase of 138% per annum. In contrary the average *existing product* entrepreneur only expects their annual turnover to rise from £45,000 to £75,000, representing an increase of just 20% per annum.

Such optimistic expectation of future prospect may or may not be justifiable. However, it is hard for assessors to know this as there is no precedent to follow. When such expectation is incorporated into the business plan, banks and other financial investors are likely to question such high expectations of return.

Table 2 Mean and median characteristics of the sample by product innovation*

	Innovative	Partially new	Existing	Total
Start up funds required (£)	101,256 (20,000)	71,293 (13,000)	85,588 (10,000)	83,683 (13,000)
Start up funds required from external sources (£)	39,148 (10,000)	16,375 (7,500)	33,169 (9,300)	29,167 (9,057)
Estimated annual turnover (£)	391,940 (60,000)	1,060,340 (50,000)	272,945 (45,000)	526,427 (50,000)
Estimated annual turnover in three years' time	1,071,259 (250,000)	2,108,955 (80,000)	2,043,521 (75,000)	1,889,408 (98,500)
Current employees	9.9 (0)	66.9 (3)	17.5 (0)	35.6 (1)
Expected employees in 5 years time	28.4 (6)	23.8 (6)	14.6 (4)	19.6 (5)

* Median characteristic values shown in parenthesis

Table 3 suggests that there is indeed a funding problem for *innovative product* entrepreneurs. Only 31.6% of *innovative product* entrepreneurs feel that there are adequate external funding compared to 33.3% for *partially new product* entrepreneurs and 40.5% for *existing product* entrepreneurs.

Table 3 Whether respondents feel that there is lack of external funding available by product innovation

	Innovative	Partially new	Existing	Total
No.	12	24	34	70
%	63.16	53.33	45.95	50.72

5. Financing channels of innovative entrepreneurs

The rest of this study looks at the liquidity problem more closely by breaking down external finance into smaller categories, then examining each source of finance entrepreneurs attempted to obtain, both successfully and unsuccessfully. Data for successful and unsuccessful attempts made on each type of external finance source is available in the GEM UK dataset. Two extra variables are calculated for this study. They are, the attempt rate (Table 4), and the rejection rate (Table 5).

Table 4 Attempted source of finance by respondents by product innovation

		Innovative	Partially new	Existing	Total
Friends and Family	No.	32	77	146	255
	%	25.4	32.1	35.3	32.7
Business Angels	No.	26	51	56	133
	%	20.6	21.3	13.5	17.1
Unsecured Bank Loan	No.	15	24	77	116
	%	12.0	10.0	18.6	14.9
Bank Overdraft	No.	18	52	120	190
	%	14.3	21.7	29.0	24.4
Non-Bank Unsecured Loan	No.	5	35	20	60
	%	4.0	14.6	4.8	7.7
Mortgage	No.	6	26	62	94
	%	4.8	10.8	15.0	12.1
Venture Capital	No.	12	21	23	56
	%	9.5	8.8	5.6	7.2
Government Grants	No.	21	56	49	126
	%	16.7	23.3	11.8	16.2
Credit Cards	No.	24	37	56	117
	%	19.0	15.5	13.5	15.0

Table 5 Rejection rate by product innovation

		Innovative	Partially new	Existing	Total
Friends and Family	No.	8	6	12	26
	%	25.8	7.8	8.2	10.2
Business Angels	No.	11	17	21	49
	%	42.3	33.3	37.5	36.8
Unsecured Bank Loan	No.	3	7	26	36
	%	18.8	29.2	33.8	30.8
Bank Overdraft	No.	3	8	19	30
	%	16.7	15.4	15.8	15.8
Non-Bank Unsecured Loan	No.	2	8	9	19
	%	33.3	22.9	45.0	31.1
Mortgage	No.	4	8	21	33
	%	66.7	32.0	33.9	35.5
Venture Capital	No.	7	5	6	18
	%	58.3	25.0	25.0	32.1
Government Grants	No.	10	13	19	42
	%	47.6	23.2	38.8	33.3
Credit Cards	No.	6	5	9	20
	%	25.0	13.5	16.4	17.2

(i) Friends and Family

Table 3 shows that *friends and family* is the most popular source of finance sought after by *innovative product* entrepreneurs as would be expected following the POH where internal sources of funding are utilised before looking for external sources of finance (Myers, 1984; Myers and Majluf, 1984). However, when compared with other types of entrepreneurs the attempt rate for friends and family loan is much lower from *innovative product* entrepreneurs (25.4%) than from *partially new product* (32%) and *existing product* (35%) entrepreneurs. In addition *innovative product* entrepreneurs also have the highest rejection rate of all types of entrepreneurs using this channel of finance. The rejection rate is 26% for *innovative product* entrepreneurs which is much higher than that of *partially new product* (8%) and *existing product* (8%) entrepreneurs. Although there may be a self-selection problem, these data largely indicate that it is generally more difficult for *innovative product* entrepreneurs to obtain finance from their *friends and family* than by entrepreneurs using older products. This indicates that *innovative product* entrepreneurs have difficulties to convince their *friends and family* that their product will be a sell-out. This is mainly due to the problem of lack of information. It is most likely that their friends and family had never heard of their product. As

there is no precedent regarding the product, it is also very difficult for them to make a prediction on the likely reaction from the market and the demand for the product. This is not helped by the fact that friends and family do not normally ask for a formal business proposal which make it even more difficult for them to make a rational decision regarding their investment behaviour.

On the other hand the *seek-and-succeed* rate for *partially new product* entrepreneurs from *friends and family* is very similar to the rate for *existing product* entrepreneurs (32% compared to 34%). In addition both types of entrepreneurs have much lower rejection rate than *innovative product* entrepreneurs. This indicates that friends and family are almost indifferent between lending to *partially new product* and *existing product* entrepreneurs. In fact a *partially new product* is most likely to be an *in* product that is proven to be a market success. There may possibly be a large amount of media coverage surrounded the product due to aggressive advertisement strategy promoted by some pioneer companies. Thus there are more knowledge and facts for *friends and family* investors to base their decision on. In addition the fact that it is a new product may possibly create a *thrill* effect that may well reduce the level of rejection. In other words *friends and family* investors do not mind a product being exotic as long as it is not too exotic. Data also indicates that *friends and family* are often treated as the last resort for funds as 38% who reported to have unsuccessfully obtained finance from friends and family also have successfully obtained finance from friends and family, in other words multiple attempts are often made upon this source of finance.

(ii) Equity Finance

Business angels are the second most popular source of finance sought after by *innovative product* entrepreneurs with 20.6% of respondents reported to have sought finance from this channel. *Venture capital* receives less attention from *innovative product* entrepreneurs with 9.5% of respondents attempted to seek finance through it. However, the attempt rates for both *business angel* and *venture capital* are higher from *innovative product* than *existing product* entrepreneurs (13.5% for *business angel* and 5.6% for *venture capital*) suggesting that equity finance is relatively more popular amongst *innovative product* entrepreneurs as had been found by previous studies. This is possibly due to the fact that TBSF owners feel *venture capitalists* understand their businesses better than banks (Gompers and Lerner, 2003; Hogan and Hutson, 2005) or specialise in certain fields (Dahlstrand and Cetindamar, 2000). Preconceptions such as these could explain the higher attempt rates by *innovative product* entrepreneurs particularly as it has been shown that TBSF owners are more willing to give up control in order to pursue greater innovation (Berggren *et al.*, 2000) or greater growth to achieve financial reward on exit (Cressey and Olofsson, 1997). Although it is true that equity financiers are likely to be less risk averse than debt financiers as they share in upside in the business but this does not by any means suggest that they are reckless in making business decisions. As a matter of fact the rejection rates by both *venture capital* and *business angels* are much higher for *innovative product* than for *existing product* entrepreneurs (58.3% compared to 26% and 42.3% compared to 37.5% respectively). This suggests that poor business ideas with inadequate planning are still likely to be rejected by equity financiers.

(iii) Bank and other financial loans

The attempted usage of banking and other related financial products is low amongst *innovative product* entrepreneurs with the attempt rates being 12% for unsecured bank loan, 5% for secured bank loan and 4% for non-bank unsecured loan (the respective rates for *existing product* entrepreneurs are 18.6%, 4.8% and 15%). Consequently, the *seek-and-succeed* rate for bank and other financial loans is relatively low amongst *innovative product*

entrepreneurs ranging from 3.2% for non-bank unsecured loan to 11% for unsecured bank loan. The *seek-and-succeed* rates for *innovative product* entrepreneurs are much lower than that of *existing product* entrepreneurs and in the case of mortgage and non-bank secured loan also lower than *partially new* products, confirming the findings of Hogan and Hutson (2005). *Innovative product* entrepreneurs also have the highest rejection rate of all types of entrepreneurs using mortgage and non-bank unsecured loan at 67% and 40% respectively. For mortgage the rejection rate is twice as high as *partially new products* and *old products* entrepreneurs.

These figures indicate that debt finance is not popular amongst *innovative product* entrepreneurs and there is a high rejection rate for those who choose to use this method of finance. The self-exclusion with this method of finance is likely to be due to entrepreneurs' perception of the low likelihood of success due in part to the intangible nature of much of the *new product* entrepreneurs' assets (Myers, 1977; Hogan and Hutson, 2005). Bank lending is often based on formal business assessment. However, constructing a business plan for new product is highly difficult. Market reaction and demand for new product is simply impossible to predict which makes the self-assessment of *innovative product* entrepreneurs hard to validate. Thus lending to *innovative product* entrepreneurs can be a very risky business for banks and financial institutions even if the idea seems likely to succeed particularly as debt financiers would not share in any upside.

Banks are found to be more likely to cater for *partially new product* entrepreneurs. When the product is new to some but not to everyone it is found that bank *seek and succeed* rates for bank-related sources are higher than average while the rejection rates are lower than average. This is because bank assessors are likely to have heard of a partially new product due to their job nature and therefore are able to assess the potential of the product. Bank lending is also found to be keener on *partially new products* over *existing product* both in terms of lower rejection rates. This is because partially new products have potential to expand while a market for an old product is often saturated.

(iv) Government Grants

According to the figures government grant is most sought after by *partially new product* entrepreneurs (23.3%) followed by *innovative product* entrepreneurs (17%) and *existing product* entrepreneurs (12%). However, when it comes to rejection rate it is the *innovative product* entrepreneurs who suffered with 48% of funding requested being rejected. This is by far the largest rejection rate with *existing product* entrepreneurs being a remote second at 39%. The *partially new product* entrepreneurs on the other hand have the lowest rejection rate at 23.2%. The finding indicates that like banks and other formal financial institutions, government grants have the reputation of lending largely to *partially new products* entrepreneurs rather than the brand new product entrepreneurs. Thus although the government often tries to promote innovative enterprise development, they prefer to assist *proven* innovations that are already tested by the public. To support a new innovation is probably too risky for the government and can lead to political backlash when attacked by the public.

(v) Short-term Debt Financing

Although it may come as a surprise, many entrepreneurs have used credit cards and overdraft to fund their business venture. 19% of *innovative product* entrepreneurs have attempted to use credit card while 14% have used overdraft. These informal loans are more popular than other bank loans due to the relatively less formal application procedures (relatively hassle free) and relatively low rejection rates. The rejection rates for overdraft and credit card are

17% and 25% respectively which are amongst the lowest of all financial sources. They are therefore, often used by entrepreneurs as a last resort when all other methods failed.

6. Financing channels of new technology entrepreneurs

This study also looks at the financing channels of *new technology entrepreneurs*. Although the overall picture is less clear, the high usage of *friends and family* and short term debt finance and the low usage of formal financial channels suggest that *new technology products* may find it even more difficult to finance their product through external sources. *Friends and family* is the most popular source of finance sought after by *new technology entrepreneurs* with 39.4% of respondents reported to have used finance from these channels. *Bank overdraft* and *credit card* come remote second and third with 17.4% and 15% of respondents respectively reported to have used these informal channels. Formal financial channels appear to be less popular with *new technology entrepreneurs*, with none of the usage rate exceeds 15% from *new technology entrepreneur* respondents.

Table 6 Attempted source of finance by respondents by production innovation

		<1 Year	1-5 Years	5> Years	Total
Friends and Family	No	43	53	159	255
	%	39.4	31.9	31.5	32.7
Business Angels	No	8	40	85	133
	%	7.4	24.1	16.8	17.1
Unsecured Bank Loan	No	14	33	69	116
	%	12.8	20.0	13.7	14.9
Bank Overdraft	No	19	57	113	189
	%	17.4	34.3	22.4	24.3
Non-Bank Unsecured Loan	No	8	17	36	61
	%	7.3	10.2	7.1	7.8
Mortgage	No	12	24	58	94
	%	11.0	14.5	11.5	12.1
Venture Capital	No	9	23	24	56
	%	8.3	13.9	4.8	7.2
Government Grants	No	15	28	83	126
	%	13.8	16.9	16.4	16.2
Credit Cards	No	16	37	65	118
	%	14.7	22.3	12.9	15.1

High rejection rates are found amongst *new technology entrepreneurs* using formal financial channels. 75% of *new technology entrepreneurs* who have attempted to use *non-bank unsecured loans* failed to access funding through this channel while 67% of those who tried to use *business angel* finance and *mortgages* failed. The rejection rates for *new technology entrepreneurs* are over one and a half times higher than *existing technology entrepreneurs* in all three cases. Unsurprisingly the rejection rate from *friends and family* is relatively low with only 16.3% of those who used this channel failed. Nevertheless, the rejection rate from *friends and family* is higher for *new technology* than for *old technology entrepreneurs* suggesting that they are relatively less keen on lending to *new technology entrepreneurs* possibly due to higher risk involved in their ventures. Except government grant, the rejection rates are higher for *new technology* than for *old technology entrepreneurs* for all other sources. This suggests that like *innovative product entrepreneurs*, there is a financing problem for *new technology entrepreneurs* when starting a business.

Table 7 Rejection rate by production innovation

		<1 Year	1-5 Years	5> Years	Total
Friends and Family	No	7	7	13	27
	%	16.3	13.5	8.2	10.6
Business Angels	No	6	12	31	49
	%	66.7	30.0	36.9	36.8
Unsecured Bank Loan	No	7	4	24	35
	%	50.0	12.1	34.8	30.2
Bank Overdraft	No	6	3	22	31
	%	31.6	5.2	19.3	16.2
Non-Bank Unsecured Loan	No	6	0	13	19
	%	75.0	0.0	35.1	31.1
Mortgage	No	8	3	22	33
	%	66.7	13.0	37.9	35.5
Venture Capital	No	3	7	8	18
	%	37.5	30.4	33.3	32.7
Government Grants	No	4	11	27	42
	%	25.0	39.3	32.5	33.1
Credit Cards	No	3	5	11	19
	%	20.0	13.5	17.2	16.4

The results presented in this Section and the proceeding section confirm the results found by other studies that the POH does not hold for TBSFs with a greater preference found for equity finance than debt finance. The remainder of this study will explore a different aspect of the funding problem, the reasons that entrepreneurs themselves feel have resulted in the failure to gain finance. Given the similarity in the characteristics of *new product* and *new technology entrepreneurs* with regard to choice of finance sources in order to preserve space the rest of the analysis of this study will focus on *innovative product entrepreneurs* rather than *new technology entrepreneurs*.

7. Main barriers to obtain finance for innovative entrepreneurs

The high rejection rate amongst *innovative product entrepreneurs* should be a major cause for concern given the importance of innovative entrepreneurs in the development of a vibrant and technologically-advanced economy. As such, higher rejection rates can act as a major hindrance for potential *new products entrepreneurs* attempting to start a business which can reduce the level of entrepreneurship and the level of economic activity particularly in areas of high potential growth. Therefore, there is a need to examine the causes of the high rejection rates in more detail. This study tries to look at this problem from the point of view of the entrepreneurs. The GEM UK survey asks the entrepreneurs who had been unsuccessful in obtaining finance, their opinion as to the reason for their attempts being unsuccessful. Results suggest that two of the most common causes for failing to access funding are *not being investor ready* and *inadequacies in the business plan* with over 50% of unsuccessful respondents in each case citing them as the main barriers. These are followed by *the high cost of finance* (45%), *nature of business* (37%), *fear of debt* (37%), *unwillingness to share ownership of the business* (35%) and finally *weak management team* (10.5%).

Table 8 Reasons for failing to access funding, by product innovation

		Innovative	Partially new	Existing	Total
Not Investor Ready	No.	11	22	20	53
	%	57.9	47.8	26.7	37.9
Nature of Business	No.	7	10	19	36
	%	36.8	22.2	25.7	26.1
Inadequacies of business Plan	No.	10	6	14	30
	%	52.6	13.0	18.7	21.4
Business too small	No.	1	17	19	37
	%	5.0	37.8	25.3	26.4
Fear of Debt	No.	7	18	24	49
	%	36.8	40.0	32.4	35.5
Unwillingness to share business	No.	7	5	15	27
	%	35.0	11.1	20.3	19.4
Cost of finance too high	No.	9	17	17	43
	%	45.0	37.0	22.7	30.5
Weak management team	No.	2	8	3	13
	%	10.5	17.4	4.1	9.4

(i) Inadequacy in terms of preparation

As mentioned earlier, inadequacies in terms of preparation either as *not being investor ready* or *inadequacies in the business plan* are cited by *innovative product entrepreneurs* as the most common reason for failing to access finance. Their respondent rates are much higher than that for *partially new product* and *existing product entrepreneurs* with *innovative product entrepreneurs* being twice as likely to cite these reasons than *existing product entrepreneurs*. The relatively high percentage of people citing inadequate preparation as their reason for failing to access funding suggests that there is a tendency for *innovative product entrepreneurs* to rush their products into the market without fully considering their viability. They appear to feel that there is a need to push the idea into the market as quickly as possible before someone else replicates their ideas and reduce their share of profits. This leaves them with little time to prepare for a business plan that is of an adequate standard.

Many innovative entrepreneurs are likely to be inventors of the new product themselves. They are often very gifted in science and technology but possibly lack the skills to transform their idea into a viable business. Consequently, they may have poorer business skills than other entrepreneurs. Table 8 shows that larger number of *innovative product entrepreneurs* are found to have problems with developing a strong management team than *existing product entrepreneurs* (10.5% compared to 4%). As human nature tends towards the familiar, *innovative product entrepreneurs* may be more willing to welcome like-minded individuals that are competent scientists and engineers but poor business planners into their inner circle within the business. From the other side of the argument, they may be reluctant to introduce business-minded individuals into their team due to difficulties in understanding and culture clashes that are likely to occur. This makes it harder for *innovative product entrepreneurs* to present their idea in front of business-minded bank managers and potential stakeholders.

Consequently, preparation is often beneath the required level. Potential problems arise such as lack of market research, costing strategy, patent and copyright and failure to produce a final product. Business plan preparation in particular is a major problem as 53% of *innovative product entrepreneur* respondents found it a major barrier as opposed to 19% for *existing product* respondents. As mentioned earlier, the inadequacies in the business plan may reflect the fact that the business is not ready to be invested in. At the same time it is also a lot harder to write a business plan about new innovative products. Banks and investors are less likely to be convinced by their forecasts on market size, growth potential, expected profit margins and level of job creation. As a result, many of these proposals are not perceived by banks and investors as legitimate.

These unsolved obstacles make it less likely for potential investors to be interested in investing in new innovative products. This is particularly the case for formal financial

institutions that require formal business proposal and conduct their own assessment through specialised in-house credit experts. Entrepreneurs themselves are aware of the problem and therefore, a large proportion of them at the end resort to informal finance and private investors rather than formal financial institutions. *Friends and family* and *short-term debt financing* are highly popular amongst *innovative product entrepreneurs*. *Equity finance* is also highly popular amongst *innovative product entrepreneurs* as it is believed that these private investors do not ask for formal business assessment. However, despite the relatively soft image, high rejection rate from equity financiers indicates that these lenders also make stringent assessment before they provide finance.

(ii) Inadequacy in terms of cost of finance

Innovative product entrepreneurs have great difficulty in obtaining affordable finance. 45% of *innovative product entrepreneur* respondents found *high cost of finance* as a major barrier to access finance compared to 23% for *existing product entrepreneurs*. The high cost of finance reflects the risky nature of their business as investors are more likely to raise the interest rates to compensate for the higher risk involved in innovative ventures.

(iii) Unwillingness to share business

Innovative product entrepreneurs are also more reluctant to share their businesses with investors. 35% of *innovative product entrepreneurs* reported *unwillingness to share ownership of the business* as a major barrier to accessing finance compared to 20.3% for *existing product entrepreneurs*. As mentioned many *innovative product entrepreneurs* are likely to be passionate about their product as they may have been heavily involved in its development, it is their baby. They are therefore less willing to give up their sole ownership right as it represents losing control of the product's destiny.

8. Conclusion and discussion

Using GEM UK (2005) dataset, this study found that there is a liquidity constraint problem for start-up entrepreneurs using new products and technologies. The low attempt and high rejection rates for formal bank and other financial loans suggest that these sources are widely known by both *innovative product* and *new technology entrepreneurs* as difficult to obtain. At the same time the high attempt and high rejection rates for *innovative product* and *new technology entrepreneurs* for *business angel* and *venture capital* investors suggest that there is an incorrect preconception regarding the nature of these investors. We suggest that although these investors are likely to be less risk-averse when compared with formal financial institutions they are still cautious professional financial lenders who will examine the viability of their ventures thoroughly. Consequently, *innovative product* and *new technology entrepreneurs* are most likely to rely on informal source of finance such as friends and family, bank overdraft and credit card rather than formal sources of finance. The high attempt and low rejection rates amongst *innovative product* and *new technology entrepreneurs* for informal sources of finance suggest that they are rightly perceived as trouble-free uncomplicated sources of finance. However, while overdraft and credit card lending are costly, funds from friends and family can be relatively limited. Since the median required external start-up funds of *new product* and *new technology entrepreneurs* is higher than for those with established products and production technology this is likely to be major growth constraint. However, since GEM UK (2005) data does not provide information on the amount of loan required from each source of finance it is very difficult to assess the extent of the problem.

One policy implication of this study is that the government should re-consider their policy on enterprise training provision. According to GEM UK (2005) data, around a quarter

of the *innovative product entrepreneurs* have attended government enterprise training, which is consistent with the overall average figure. If as suspected *innovative product entrepreneurs* are less likely to have a business background it would be expected that participation in enterprise training schemes needs to be higher for this group. However, the relatively high rejection rates amongst *innovative product entrepreneurs* by formal financial lenders suggest that current government enterprise training programmes are either not taken up in sufficient numbers by *innovative product entrepreneurs* or where taken up do not cater specifically for these entrepreneurs.

This study suggests that *innovative product entrepreneurs* face very different financial obstacles when compared with entrepreneurs selling older products. In particular, their weaknesses in the business and management aspects of the production process should be a major cause for concern. *Innovative product entrepreneurs* are found less likely to possess the business skills required for start-ups and are less able to construct a management team capable of running business. In particular, lack of capability in writing business plan and proposal appears to be a major problem in obtaining finance. This may be due to their tendency to rush their products into the market without fully considering their viability or simply that they lack essential management skills to convince the investors. Further research is required to identify the source and the extent of the poor management problem.

Notes

¹ In terms of the whole population of small firms, there are approximately 3.7 million businesses in the UK and 99% of these businesses employ less than 50 employees. In other words less than one percent of all businesses (just over 31,000 firms) in the UK are not small or micro businesses, (Curran and Blackburn, 2001). They contribute 46% towards non-government employment and 42% towards turnover. In 1999 over 450,000 people started their own businesses or became self-employed and in the same year over 400,000 businesses ceased trading (OECD, 2000). Similarly, over 95% of enterprises in the OECD area are SMEs and they account for 60-70% of jobs in most countries.

² For example Amit, Glosten and Muller (1990) suggest that the entrepreneur's abilities such as talent, skills, experience, ingenuity and leadership allow them to combine tangible and intangible assets in a novel way to be deployed to satisfy customer needs in an extraordinary way, are very important for the future returns from the venture capital investment. However, these abilities are hidden from venture capital firms (VCFs), and are specifically known only to the entrepreneurs (Bergemann and Hedge, 1998). This inability of the VCs to assess the venture founder's skills and abilities may influence both the entrepreneur's decisions whether to involve VCs, or not, and the VCs whether to invest in such ventures, or not. This situation leads to the asymmetry of information, which results in to moral hazard and adverse selection.

³ Himmelberg and Petersen (1994) and Jordan, Lowe and Taylor (1998) suggest that in innovative small firms, collateral values are typically low since the key strategic resource is often the knowledge embodied in the firm's personnel, delaying access to some sources of finance compared to more conventional SMEs.

⁴ Internal finance sources can also include the personnel assets of the owner of the firm, as well as the assets held within the company.

⁵ However, according to BVCA (British Venture Capital Association) in 1994, later stage financing represented 94% of the total value of venture capital investments and 81% of the total number of projects financed. Similarly the EVCA (1995) states early stage and start-up funds, accounted for only 6% of the annual value of investments, whilst later stage financing accounted for 46% of funds invested.

⁶ Murray and Lott (1995) investigate the issue whether the UK venture capital firms have a bias against investing in TBSFs at their early stages. They find that US venture capital firms invest three times more than their UK counterparts in young new technology-based firms after excluding the Management Buy-in (MBI) and Management Buy-out (MBO) investments. In the US venture capital firms tend to invest more in the early stages of TBSFs whilst in the UK venture capital firms have a tendency to invest in MBOs/MBIs and in the later stages of TBSFs development.

⁷ Lethbridge (2003) suggests that it is comparatively harder for new innovative products based on new technology than established products based on known technology to get funding.

⁸ Although Table 2 shows the mean characteristics of nascent entrepreneurs' start-ups, due to the tendency to be strongly positively skewed, median characteristics may be more representative, and are therefore also presented.

References

- Admati, A. R. and Pfleiderer, P. (1994) 'Robust financial contracting and the role of VCs', *The Journal of Finance*, 49:2, 371-401.
- Advisory Council on Science and Technology (ACOST). (1990), *The Enterprise Challenge: Overcoming Barriers to Growth in Small Firms*, HMSO, London.
- Amit, R., Glosten, L. and Muller, E. (1990) 'Entrepreneurial ability, venture investments and risk sharing', *Management Science*, 36:10, 1232-1245.
- Bates, T. (1997) 'Financing small business creation: the case of Chinese and Korean immigrant entrepreneurs', *Journal of Business Venturing*, 12, 109-124.
- Berger, A. N. and Udell, G. F. (1998) 'The economics of small business finance: the roles of private equity and debt markets in the financial growth cycle', *Journal of Banking and Finance*, 22, 613-673.
- Bergemann, D. and Hedge, U. (1998) 'Venture capital financing, moral hazard and learning', *Journal of Banking and Finance*, 22, 703-735.
- Berggren, B. Olofsson, C. and Silver, L. (2000) 'Control aversion and the search for external financing in Swedish SMEs', *Small Business Economics*, 15:3, 233-242.
- Bolton, E. J. (1971) *Small Firms: Report of the Committee of Inquiry on Small Firms*, London, H.M.S.O.
- Cable, D. M. and Shane, S. (1997) 'A prisoner's dilemma approach to entrepreneur-VC relationships', *Academy of Management Review*, 22:1, 142-176.
- Chan, Y-S., Siegel, D. and Thakor, A. V. (1990), 'Learning corporate control and performance requirements in venture capital contracts', *International Economic Review*, Vol. 31, No. 2. pp. 365-381.
- Cressey, R. and Oloffson, C. (1997) 'European SME financing: an overview', *Small Business Economics*, 9, 87-96.
- Curran, J. and Blackburn, R. A. (2001) *Researching the Small Enterprise*, Sage, London.
- Dahlstrand, A. L. and Cetindamar, D. (2000) 'The dynamics of innovation financing in Sweden', *Venture Capital*, 2:3, 203-221.
- Dewatripont, M. and Tirole, J. (1994) 'A theory of debt and equity: diversity of securities and manager-shareholder congruence', *Quarterly Journal of Economic*, 109, 1027-1053.
- Gompers, P. A. (1995) 'Optimal investment, monitoring, and the staging of venture capital', *Journal of Finance*, 1:5 1461-1487.
- Gompers, P. and Lerner, J. (2003) 'Equity financing', In Acs, Z. J. and Audretsch, D. B. (Eds.), *Handbook of entrepreneurship research*, Kluwer Academic Publishers.
- Harrison, R. T., and Mason, C. M. (2004) 'Financial bootstrapping and venture development in the software industry', *Entrepreneurship & Regional Development*, 16, 307-333.
- Hart, O. and Moore, J. (1998), 'Default and Renegotiation: A Dynamic Model of Debt', *The Quarterly Journal of Economics*, 113:1, 1-41.

- Himmelberg, C. P. and Peterson, B. C. (1994) 'R&D and internal finance: a panel study of small firms in high technology industries', *Review of Economics and Statistics*, 76, 38-51.
- Hogan, T., and Hutson, E. (2005) 'Capital structure in new technology-based firms: evidence from the Irish software sector', *Global Finance Journal*, 15, 369-387.
- Jensen, M. C. and Meckling, W. H. (1976) 'Theory of the firm, managerial behaviour, agency costs and ownership structure', *Journal of Financial Economics*, 3, 305-360.
- Jordan, J., Lowe, J. and Taylor, P. (1998), 'Strategy and financial policy in UK small firms', *Journal of Business Finance and Accounting*, 25, 1-27.
- Koberg, C. S., Uhlenbruck, N., and Sarason, Y. (1996) 'Facilitators of organisational innovation: the role of life-cycle stage', *Journal of Business Venturing*, 11, 133-149.
- Landstrom, H. (1993) 'Informal risk capital in Sweden and some international comparisons', *Journal of Business Venturing*, 8, 525-540.
- Lethbridge, D (2003) 'Innovation in technology versus innovation in financing: two case studies', *Technovation*, 23, 869-878.
- MacMillan, I. C., Siegel, R. and Subbanarasimha, P. N. (1985) 'Criteria used by VCs to evaluate new venture proposals', *Journal of Business Venturing*, 1, 119-128.
- Murray, G. C. and Lott, J. (1995), 'Have UK venture capital firms a bias against investment in new technology-based firms?', *Research Policy*, 24, 283-299.
- Muzyka, D., Birley, S. and Leleux, B. (1996), 'Trade-offs in the investment decisions of European VCs', *Journal of Business Venturing*, 11, 273-287.
- Myers, S. C. (1977) 'Determinants of corporate borrowing', *Journal of Financial Economics*, 5, 146-175.
- Myers, S. C. (1984) 'The capital structure puzzle', *Journal of Finance*, 39:3, 575-592.
- Myers, S. C. and Majluf, N. C. (1984), 'Corporate financing and investment decisions when firms have information that investors do not have', *Journal of Financial Economics*, 13, 187-221.
- OECD Small and Medium-sized Enterprises Outlook, 2000 edition.
- Pissarides, F. (1999) 'Is lack of funds the main obstacle to growth? EBRD'S experience with small and medium-sized businesses in central and eastern Europe', *Journal of Business Venturing*, 14, 519-539.
- Roberts, E. B. (1991) *Entrepreneurs in high technology; Lessons from MIT and beyond*. Oxford University Press.
- Stiglitz, J. E. and Weiss, A. (1981) 'Credit rationing in markets with imperfect information', *American Economic Review*, 71:3, 393-410.
- Tourigny, D., and Le, C. D (2004) 'Impediments to innovation faced by Canadian manufacturing firms', *Economics of Innovation and New Technology*, 13:3, 217-250.
- Westhead, P. and Storey, D. J. (1997), 'Financial constraints on the growth of high technology small firms in the United Kingdom', *Applied Financial Economics*, 7, 197-201.

Wilson, H. (1979), *The Financing of Small Firms*: Interim Report of the Committee to Review the Functioning of Financial Institutions, London, H.M.S.O.

Wright, M. and Robbie, K. (1998) 'Venture capital and private equity: a review and synthesis', *Journal of Business Finance and Accounting*, 25:5/6, 521-570.