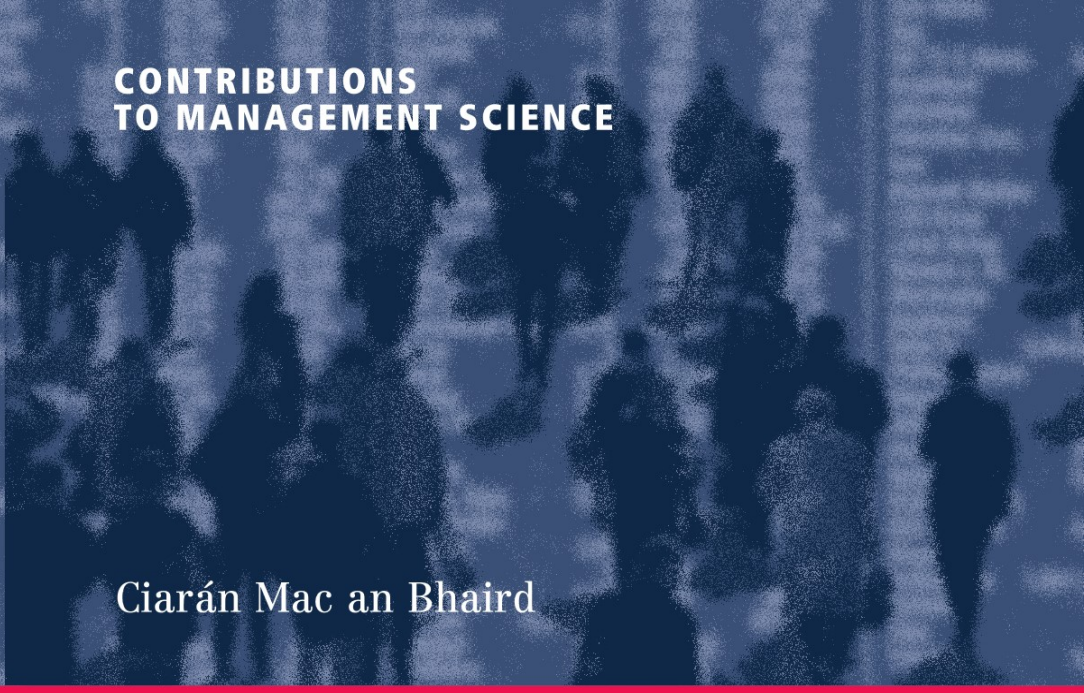

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Ciarán Mac an Bhaird

Resourcing Small and Medium Sized Enterprises

A Financial Growth Life Cycle Approach

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Ciarán Mac an Bhaird

Resourcing Small and Medium Sized Enterprises

A Financial Growth Life Cycle Approach

Physica-Verlag

Dr. Ciarán Mac an Bhaird
Fiontar
Dublin City University
Dublin 9
Ireland
ciaran.macanbhaird@dcu.ie

ISSN 1431-1941
ISBN 978-3-7908-2398-1 e-ISBN 978-3-7908-2399-8
DOI 10.1007/978-3-7908-2399-8
Springer Heidelberg Dordrecht London New York

Library of Congress Control Number: 2009939438

Cover design: SPi Publisher Services

Printed on acid-free paper

Physica-Verlag is a brand of Springer-Verlag Berlin Heidelberg
Springer-Verlag is a part of Springer Science+Business Media (www.springer.com)

"..... I was brought up on the theory of the "economics of scale" – that with industries and firms, just as with nations, there is an irresistible trend, dictated by modern technology, for units to become even bigger. Now, it is quite true that today there are more large organisations and probably also bigger organisations than ever before in history; but the number of small units is also growing and certainly not declining in countries like Britain and the United States, and many of these small units are highly prosperous and provide society with most of the really fruitful new developments" (Schumacher 1973, p. 48).

Preface

The subject of this book, Small and Medium sized Enterprise (SME) financing, is one of the most pertinent topics in the present turbulent economic environment. As countries across the globe are confronted with an increasing number of challenges, including rising unemployment and falling growth rates, the economic contribution of SMEs is more important than ever. This importance is increased because of rationalisation programmes and downsizing by large corporations, emphasising the central role of the SME sector in the recovery and revitalisation of world economies. Development of a vibrant, sustainable small firm sector is dependent on sufficient resourcing of SMEs, particularly adequate capitalisation. This book provides a timely examination of SME financing, focussing on determinants of capital structure.

Although the study of SME financing is in its infancy, one may question the need for another book on the subject. This text differs from previous tomes, which typically focus on the "problem" of small firm financing and apparent gaps in supply of finance to the sector. Employing financing data from a survey of Irish SMEs, this book affords the reader a novel perspective on firm financing in which financial resources employed by firms are modelled across a financial growth life cycle. This approach facilitates identification of resource and management issues at various points in a firm's life cycle. Another notable feature of this study is the methodological approach adopted in examining SME financing. Analysis of stated financing preferences and objectives of SME owners is combined with results of statistical analysis of firm characteristics in exploring holistic explanations for observed capital structures. The uniqueness of this approach is in the contribution of data on financing preferences to supplement and contextualise results of bivariate and multivariate statistical tests. This methodology extends the SME literature, as previously published studies considered multivariate analysis of quantitative data (Hall et al. 2004), or an examination of "qualitative data" concerning firm owners' preferences and motivations (Michaelas et al. 1998), but rarely a combination of both. The approach adopted in this book overcomes the concern of Curran and Blackburn with researchers employing solely quantitative techniques, explicitly

recognising "...the key importance of owner-managers in the decision making processes of the small firm" (Curran and Blackburn 2001, p. 99).

Whilst this book is predominantly academic in character and orientation, it addresses a number of important practical and policy issues. Firstly, it presents and analyses fresh and original data on the financing of an important sector of the Irish economy. This is significant, as much academic and media attention over the past decade has focussed on Multinational Enterprises and patterns of Foreign Direct Investment, particularly in the Irish context. A second important contribution of this book, typically neglected in previous academic and policy studies, is the presentation and analysis of data on the personal contribution of the firm owner in resourcing the firm. This contribution is noteworthy, not only because it is extremely difficult to obtain this sensitive information, but also because of the importance of these resources in financing SMEs. A third contribution of this study is the inclusion of empirical data on the provision of collateral in sourcing finance. Employing data on firm owners' collateral contributes to a deficit in the literature highlighted by Hall et al. (2004, p. 717), "....[capturing] the use of private collateral provided by the owner". Additionally, inclusion of collateral as an explanatory variable addresses the assertion of Berger and Udell (2006, p. 2,947), that "...asset-based lending has a significant presence in only four nations, Australia, Canada, the UK, and the US".

This book is based on a questionnaire survey of a sample of Irish SMEs. An account of the methodology employed in the study, along with a detailed description of respondent firms is provided in appendix A. Throughout the book, capital structures of respondent firms are described and analysed with reference to previous theoretical and empirical work. A comprehensive review of previous literature is provided in appendix B. An awareness of these theories and accumulated evidence contextualises this book, and provides the perspective from which the study was approached.

In conducting the primary research for this book, I received invaluable advice, support and assistance from my colleagues at Dublin City University and Trinity College Dublin, for which I am extremely grateful. I am also thankful for the considered comments and suggestions proffered by participants at conferences hosted by the Centre for Small and Medium Sized Enterprises at the University of Warwick, 2006, the Academy of Entrepreneurial Finance, 2006, the Centre for Economic and Business Research at Copenhagen, 2006, Infiniti Conferences on International Finance at Trinity College Dublin, 2006–2009, Conferences of the Institute for Small Business and Entrepreneurship, 2007–2008, the Midwest Finance Association, 2008, and at workshops conducted by the Gate 2 Growth academic organisation. I gratefully acknowledge financial assistance from the social science publication scheme of the OVPR department at Dublin City University. Buíochas ó chroí do mo thuistí, Eibhlín agus Mícheál, do mo chéile, Deirdre, d'Fhiachra agus Naoise as ucht na cabhrach agus inspreagadh a thug siad dom, agus as ucht a gcuid foighne liom i gcaitheamh na tréimhse taighde. I express

wholehearted gratitude to the firm owners and chief financial officers who freely devoted time to completing questionnaire surveys and participating in interviews. Their interest and enthusiasm was central to completion of this research, and bodes well for future studies.

September 2009 Ciarán Mac an Bhaird

Contents

Abbreviations

AIM	Alternative Investment Market
Anova	Analysis of Variance
BAN	Business Angel Network
BES	Business Expansion Scheme
BVCA	British Venture Capital Association
CSO	Central Statistics Office
ENSR	European Network for SME Research
ESRC	Economic and Social Research Council
EU	European Union (27 countries)
EVCA	European Venture Capital Association
GVA	Gross Value Added
HPSU	High Potential Start-up
IEX	Irish Enterprise Exchange
IPO	Initial Public Offering of Common Stock
IVCA	Irish Venture Capital Association
LSE	Large Sized Enterprise
MNE	Multinational Enterprise
NACE	Nomenclature Generale des Activites Economiques dans l'Union Europeenne
NAICS	North American Industry Classification System Codes
NESC	National Economic and Social Council
NPV	Net Present Value
NSSBF	National Survey on Small Business Finances
NTBFs	New Technology Based Firms
OLS	Ordinary Least Squares Regression
PLC	Publicly Listed company
R&D	Research and Development
SCF	Survey of Consumer Finances

SME	Small and Medium Sized Enterprise
SUR	Seemingly Unrelated Regression
UK	United Kingdom
USA	United States of America
VC	Venture Capital

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Chapter 1
The Role of SMEs in Western Economies

. . .it is clear that SMEs are central to any post-war OECD economy, and that their influence has grown dramatically in the post-war period

(Karmel and Bryon 2002, p. 27)

1.1 Introduction

Prior to the 1970s the focus of governments, practitioners, and academic researchers was primarily confined to large corporations, as it was considered that large enterprises were the key to economic growth. A notable development in the mid to late part of that decade was the increased attention of authors and scholars to the small business sector. The publication of "Small is Beautiful" by E.F. Schumacher in 1973 was characteristic of this change, and although he did not explicitly champion the SME business sector, his promotion of "smallness within bigness" marked a less enthusiastic attitude to large organisations than heretofore. A defining moment in the emergence of SMEs as a focus of the attention of policy makers and academic scholars was the publication of Birch's (1979) paper entitled "The Job Generation Process." Prior to this study, authors had concentrated on large publicly quoted corporations, which were considered the most important source of employment generation. Although it has since been criticised, primarily on methodological grounds (Storey 1994b), Birch's study highlighted the contribution of SMEs in terms of employment, which was a serious concern for governments at the time. Increased interest by academics and policy makers in the sector resulted in a proliferation of publications and the implementation of many and varied policy initiatives. This phenomenon was not evident worldwide, however, and the burgeoning literature that emerged originated predominantly in the US and UK. Notwithstanding an increase in the geographical range and number of publications in the past two decades, the subject of SME research is still in its infancy.

C. Mac an Bhaird, *Resourcing Small and Medium Sized Enterprises*,
Contributions to Management Science,
DOI 10.1007/978-3-7908-2399-8_1, © Springer-Verlag Berlin Heidelberg 2010

The role of SMEs in national economies has many dimensions. Firstly, the SME sector comprises the vast majority of firms in many economies in terms of absolute numbers. For example, over 99% of enterprises in the EU and US are classified as SMEs (Karmel and Bryon 2002). This statistic gives an indication of the structural composition of the macroeconomy, rather than a precise measure of the number of firms in the SME sector, which is "... difficult to estimate at any one time" (Storey 1994b, p. 8). This figure, although impressive, may give an exaggerated sense of the importance of the sector in real terms. A more proportionate measure of the contribution of the sector to the macroeconomy may be gained by examination of numbers employed, output, or Gross Value Added at factor cost (GVA), which take scalar effects into account. The SME sector is also important in terms of innovation and regional development, a contribution that is more difficult to quantify.

The importance of the sector in terms of numbers employed has been well documented, especially in Western economies (Storey 1994b; Karmel and Bryon 2002). Extensive empirical evidence indicates the job generation importance of SMEs (Birch 1979; Davidsson et al. 1999), leading Chichilnisky (2005, p. 5) to remark that "... small companies are the closest thing there is to a 'job creation machine.'" In a study of firms in the 1980s, Storey (1994b) found that small firms were faster and more consistent creators of jobs than larger firms. Even though there are also higher gross job destruction rates in the sector (Klomp and Thurik 1999) because of higher failure rates (Cressy 2006b), the share of employment accounted for by small firms has been remarkably constant (Brown et al. 1990). The latest data published by Eurostat documents that 67% of the non-financial business economy workforce in the EU were employed in SMEs (Eurostat 2008) (Table 1.1).

The employment factor has an even deeper resonance in Ireland among those who remember unemployment rates of up to 20% in the mid-to-late 1980s. The SME sector accounts for 67.5% of total employment in the Republic of Ireland (Eurostat 2008), a contribution that has traditionally been overlooked. Irish industrial policy over the past three decades has concentrated on attracting Foreign Direct Investment (FDI) (Ó Gráda 1997), particularly from the US (O' Gorman and Fitzsmions 2007). Persistently high growth rates in Irish GDP over the past decade have been largely attributed to the success of this policy (Burnham 2003; Barry and Kearney 2006), and therefore academic and government sponsored research, along with mainstream and business media, has focussed on the corporate sector.

The proportion of the share of non-financial business economy employment for each size category of SME in a number of European countries is presented in Figs. 1.1–1.3. Analysis of the employment contribution of SMEs across firm size reveals significant cross-country differences in relative importance. For example, micro enterprises are relatively more important in Greece and Italy, and medium sized enterprises less so. The opposite is true for Luxembourg and Ireland. In the Irish context, medium-sized enterprises are relatively most important, comprising 24% of non-financial business economy employment, which is significantly above the EU average of 17%. The size profile of the sample of firms examined in this study are predominantly medium-sized (58%), and the remainder are small (42%).

Table 1.1 Size indicators of SMEs in the non-financial business economy

	Number of enterprises (thousands)	Number of persons employed (thousands)	Share of SMEs in national total (%)	
			Number of enterprises	Number of persons employed
Belgium	395	1,602	99.8	66.6
Czech Republic	878	2,461	99.8	68.9
Denmark	202	1,129	99.7	66.0
Germany	1,654	12,357	99.5	60.6
Ireland	85	654	99.5	67.5
Greece	820	2,031	99.9	81.9
Spain	2,542	10,538	99.9	78.7
France	2,274	8,834	99.8	61.4
Italy	3,819	12,182	99.9	81.3
Latvia	62	469	99.7	75.6
Lithuania	93	619	99.7	72.9
Hungary	556	1,783	99.8	70.9
Netherlands	492	3,146	99.7	67.6
Austria	272	1,589	99.7	67.4
Poland	1,405	5,289	99.8	69.8
Portugal	848	2,676	99.9	82.0
Romania	410	2,463	99.5	60.8
UK	1,535	9,636	99.6	54.0
EU (27 countries)	19,602	85,000	99.8	67.1
US[a]	6,080	16,100	99.9	50.9

Source: Eurostat (2008); [a]Small Business Administration (2007)

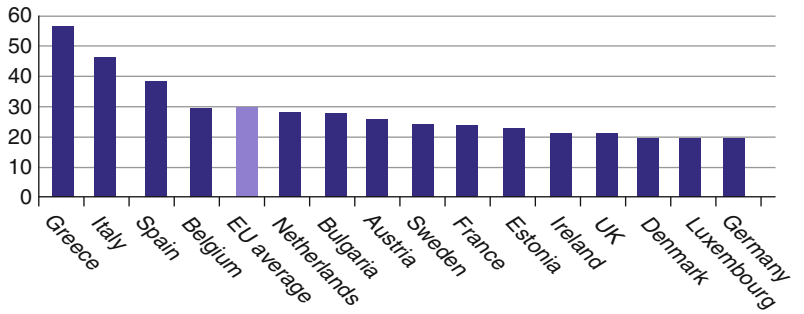

Fig. 1.1 Micro enterprise share of non-financial business economy employment in the European Union 2005 (%)
Source: Eurostat (2008)

This study, therefore, investigates the financing of the most important size categories of Irish SMEs, as classified by the European Commission (2003) definition.

The economic contribution of the SME sector in terms of employment is not confined to absolute numbers employed. Increased outputs, the taxation contribution, the resultant reduction in the dependency ratio, and other associated benefits are rarely cited. Whilst it is difficult to calculate precise values for these contributions, the myriad social and economic benefits provided by SMEs are extensive.

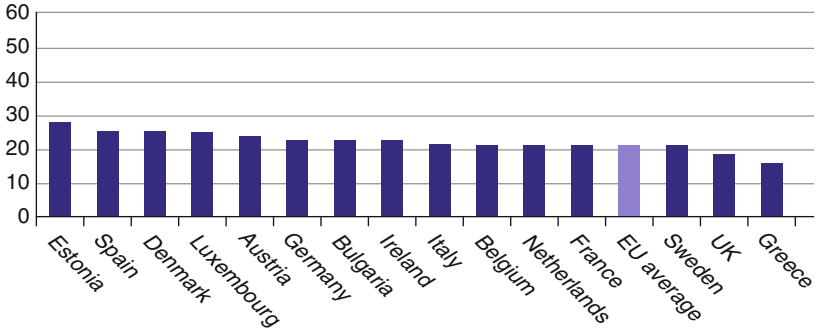

Fig. 1.2 Small enterprise share of non-financial business economy employment in the European Union 2005 (%)
Source: Eurostat (2008)

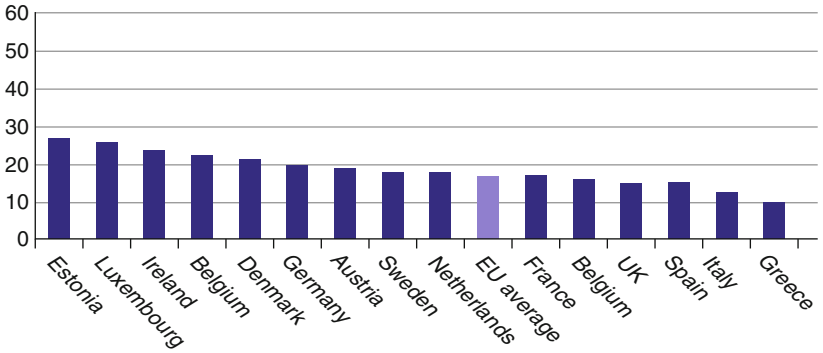

Fig. 1.3 Medium-sized enterprise share of non-financial business economy employment in the European Union 2005 (%)
Source: Eurostat (2008)

In common with similar accounts of the importance of the SME sector in terms of employment, the preceding analysis is necessarily concise. As evidenced in employment-specific studies, the subject is much more complex, concerning issues such as the quality of jobs provided by SMEs (Atkinson and Storey 1994), the higher job generation and destruction rates in SMEs (Klomp and Thurik 1999), levels of training and recruitment (Storey 1994b), and the high use of temporary employees (Kitching 1994). Notwithstanding the relatively greater contribution to absolute numbers of employees and value added by the SME sector, labour productivity per person is greater in Large Sized Enterprises (LSEs). This reflects the progressively greater increases in productivity, moving along the spectrum from micro, through small and medium, to large sized enterprises, as is evident from data presented in Table 1.2.

Significant structural differences are also evident in distribution of firm size across industry sectors. The utilities sector, for example, is dominated by large

Table 1.2 Key indicators for enterprises in the non-financial business economy in the European Union, 2005

	Micro	Small	Medium	SMEs	Large	Total
Number of enterprises (millions)	18.04	1.35	0.21	19.6	0.04	19.65
Share in total (%)	91.8	6.9	1.1	99.8	0.2	100.0
Persons employed (millions)	37.5	26.1	21.3	85.0	41.7	126.7
Share in total (%)	29.6	20.6	16.8	67.1	32.9	100.0
Value added (€billion)	1,120	1,011	954	3,090	2,270	5,360
Share in total (%)	20.9	18.9	17.8	57.6	42.4	100.0
Apparent labour productivity (€1 000 per person employed)	29.9	38.7	44.8	36.4	54.4	42.3
Relative to total (%)	70.7	91.5	105.9	86.1	128.6	100.0

Source: Eurostat (2008)

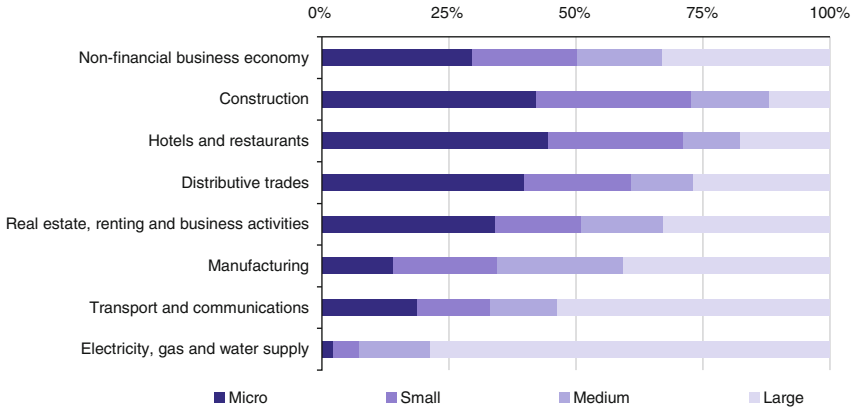

Fig. 1.4 Employment share by enterprise size class in the European Union 2005 (%)
Source: Eurostat (2008)

firms, possibly reflecting barriers to entry to the sector because of greater capital costs and the presence of a number of large natural monopolies. Sectors dominated by SMEs are predominantly in the services, hotel and restaurant, and construction sectors. Differences in the composition of industry sectors across firm size reflect the importance of financial resources and resource acquisition to entering an industry. The existing composition of a sector in terms of firm size may, in turn, influence the rate and quantity of start-ups in a sector. The latest data on composition of sectors by firm size is presented in Fig. 1.4.

Another means of measuring the economic contribution of SMEs is the contribution to Gross Value Added at constant factor cost (GVA). This statistic provides a more accurate measure of the sector's contribution;

> The small business share of value added is the best measure of the relative importance of small business in the economy. Sales tend to understate the importance of small business, and employment tends to overstate the importance of small businesses because they are more labour intensive than large businesses
>
> (Acs et al. 1999, p. 7).

Table 1.3 Value added by SMEs in the non-financial business economy in the European Union, 2005

	Value added (€ billion)	Share of SMEs in national total (%)
Belgium	83	57.8
Czech Republic	30	56.7
Denmark	67	64.8
Germany	553	53.2
Ireland	53	58.2
Greece	44	69.6
Spain	339	68.5
France	412	54.2
Italy	420	70.9
Netherlands	146	61.5
Austria	76	60.0
Poland	59	48.4
Portugal	47	67.8
Finland	40	53.9
Sweden	83	55.6
UK	501	51.0
EU (27 countries)	3,090	57.6

Source: Eurostat (2008)

The veracity of this statement is borne out by analysis of EU data presented in Table 1.3. The average percentage of GVA added by SMEs is lower than the employment contribution, comprising 57.6% of national totals. Notwithstanding this difference, SMEs are the most important sector in the economy in terms of GVA. Contribution of SMEs to GVA in the Irish context is slightly higher than the EU average, at 58.2%. Investigation of data from the Central Statistics Office (CSO), including the Annual Services Enquiry (CSO 2007b) and the Census of Industrial Production (CSO 2007c), indicates that the contribution of SMEs in terms of GVA varies across sectors and ownership structure. For example, the contribution of the services sector is much greater than the contribution of the manufacturing sector relative to that of LSEs. A greater concentration of SMEs in the services sector, depicted in Fig. 1.4, thus reiterates the importance of the sector to economic growth.

The role of SMEs in developing innovations and introducing technological changes has been highlighted in recent studies (Acs and Audretsch 2003), although the traditional view was that LSEs have advantages in pursuit of innovation because of greater market power;

> The monopolist firm will generate a greater supply of innovations because there are advantages which, though not strictly attainable on the competitive level of enterprise, are as a matter of fact secured only on the monopoly level
>
> (Schumpeter 1942, p. 101).

Empirical evidence confirms the advantage that large firms have in devoting greater resources to the pursuit of innovation. Research and development inputs increase more than proportionately with firm size (Acs and Audretsch 2003), and greater profits are generated from innovations by larger firms because of economies of

scale in promotion and distribution (Scherer 1991). Small firms are therefore perceived as at a disadvantage in engaging in innovative activity because of scale economies, due to the high fixed costs of research and development work and the considerable resources required.

The counterargument is that SMEs have a number of advantages in pursuing innovative activity. Firstly, because of a less complicated bureaucratic structure, there are less obstacles to blocking new, risky projects (Scherer 1991). Secondly, large firms may not be interested in pursuing some innovations because, although absolute return on investment is significant, it is not considered adequate. Empirical evidence suggests that SMEs have a relatively greater role in generating innovations (Scherer 1991; Aghion et al. 1999; Acs and Audretsch 2003), and have ". . . . [an] important seed-bed role in technological change and industry evolution" (Cosh et al. 1999, p. 355). The importance of SMEs in this regard is increasing, as ". . . changes in the economic and social environment have shifted the advantage of innovation towards SMEs" (Acs and Audretsch 2003, p. 73).

Given the characteristics of SMEs, it is unsurprising that firms in the sector perform an important role in regional development, particularly in peripheral regions (Giaoutzi et al. 1988). One of the reasons for this is that SMEs are ". . . firmly rooted in the economic structure of a region and constitute part of its indigenous development resources" (Giaoutzi et al. 1988, p. 11). The organisation of regional economies is typically composed of SMEs, often forming clusters of specialisation (Porter 1998). Synergies amongst these local firms in district economies may lead to fast innovation processes (Camagni 1995). Whilst empirical evidence indicates the importance of SMEs in sustaining regional economies, a number of studies show that the effect of new firm formation may not have a positive effect on regional development in all regions over time. Results from studies in a number of countries indicate that the impact of new firm formation is positive in areas of high-enterprise (Mueller et al. 2008), high labour-productivity (Fritsch and Mueller 2008) and of greater urbanisation (Van Stel and Suddle 2008). These studies indicate that new firm formation has a negative effect for low-enterprise counties (Mueller et al. 2008), and in areas of low-productivity (Fritsch and Mueller 2008). Therefore, whilst the presence of SMEs in regional economies contributes substantially to the development of the regions and may facilitate increased innovation, empirical evidence suggests that the effect of new firm formation is not always positive.

A further contribution of SMEs is in the supporting role they play to LSEs, and in particular the role they played in attracting Multinational Enterprises (MNEs) to Ireland (O' Malley and O' Gorman 2001). Factors cited by MNEs in attracting them to Ireland were "(1) indigenous firms acting as sub-suppliers in the software translation industry, and (2) the role played by indigenous firms in developing and upgrading the labour skills in that sector" (O' Gorman and Fitzsmions 2007, p. 31). The contribution of SMEs in this regard is important, but difficult to calculate precisely. Whilst it is possible to evaluate the GVA, it is more difficult to determine a value for levels of upskilling and competencies developed.

Notwithstanding well documented economic benefits of SMEs in terms of employment, GVA, and innovation, a number of important characteristics of the

sector have implications for practitioners and researchers. Firstly, empirical evidence does not suggest that greater rates of start-up activity imply greater wealth, nor is there a clear link between the relative importance of SMEs in an economy and either wealth or growth rates (Karmel and Bryon 2002). Secondly, despite the enduring importance of SMEs in providing employment, SMEs are not the "silver bullet" solution to unemployment as data in relation to employment suggests (Atkinson and Storey 1994). Additionally, growth in employment in the sector is accounted for by a small number of SMEs; for example, Storey et al. (1987) discovered that 4% of firms were responsible for over 50% of employment generated. Thirdly, the importance of SMEs may be cyclical; whilst in the EU and US SMEs grew in importance compared with LSEs from the post-war period through the early 1990s, the productivity of LSEs in the twenty-first century is growing more quickly than that of SMEs (Karmel and Bryon 2002).

These factors make the SME sector an interesting and challenging subject of research. A growing realisation of the importance of SMEs to national economies and levels of economic growth has resulted in increased focus on the sector. Scholars conducting research encounter a number of challenges. Some are attributable to the emerging nature of the subject; and others are subject specific, such as the lack of publicly available detailed data on firms in the sector. In positioning this research, it is first necessary to define the subject of analysis within specific parameters. Definitions of what constitutes an SME vary significantly in earlier studies, although more standardised classifications have emerged in recent years, as detailed in the following section.

1.2 Definitions in SME Financing Research

A commonly discussed issue in introductory paragraphs of early small firm financing studies concerned definitional aspects, which are especially complicated due to the heterogeneity of firms in the sector. This is reflected in the very different parameters employed by researchers in earlier studies. For example, in the summary of studies by researchers on the Economic and Social Research Council (ESRC) Small Business Initiative provided by Storey (1994b), definitions based on number of employees range from less than ten employees to less than 300 employees, and many measures in-between. These studies also employ definitions based on turnover and whether a firm used venture capital. This phenomenon was probably symptomatic of the "newness" of the subject of research, as it took time to develop the field of study and establish accepted definitions.

One of the earliest and most detailed attempts at devising a definition of SMEs was that specified by the Bolton Committee (1971). In attempting to account for the heterogeneity and diversity of firms in the sector, both economic and statistical aspects of SMEs were combined in an all-encompassing definition. The economic definition specified that a firm should have (1) a relatively small share of the market, (2) be managed by its owners in a personalised way, and not through a formalised

Table 1.4 Statistical definitions of small firms employed by the Bolton Committee (1971)

Industry	Statistical definition adopted by the committee
Manufacturing	200 employees or less
Construction	25 employees or less
Mining/quarrying	25 employees or less
Wholesale trades	Turnover £200,000 p.a. or less
Motor trades	Turnover £100,000 p.a. or less
Miscellaneous services	Turnover £50,000 p.a. or less
Retailing	Turnover £50,000 p.a. or less
Road transport	Five vehicles or less
Catering	All excluding multiples and brewery-managed public houses

Source: Bolton Committee (1971, p. 3)

management structure, and (3) be independent and have owner-managers free from outside control in making their decisions. The statistical definition employed by the Bolton committee (1971) varied according to sector. The committee adopted an employee upper limit of 200 for the manufacturing sector, and "... a series of more or less arbitrary definitions in terms of whatever measures appear appropriate for other trades" (Bolton Committee 1971, p. 2), and are reproduced in Table 1.4.

Although painstaking attempts by the Bolton Committee (1971) attempted to account for issues of heterogeneity among firms in the sector, Storey (1994b) detailed a number of criticisms of this approach based on the multiplicity of criteria used to define "smallness," and the complexity of definitions that make international comparisons difficult.

A definition increasingly adopted by European researchers is that based on classifications determined by the European Commission (2003). A recommendation adopted by the commission in 1996 was replaced by an amended version in 2003, which took account of economic changes and developments in the interim. Although the most commonly used measure is size in terms of numbers employed, the definition has three units of measurement:

> The category of micro, small and medium-sized enterprises (SMEs) is made up of enterprises which employ fewer than 250 persons and which have an annual turnover not exceeding 50 million euro, and/or an annual balance sheet total not exceeding 43 million euro
> (European Commission 2003, L 124/39).

The commission recommends that

> ...the criterion of staff numbers remains undoubtedly one of the most important, and must be observed as the main criterion; introducing a financial criterion is nonetheless a necessary adjunct in order to grasp the real scale and performance of an enterprise and its position compared to its competitors. However, it would not be desirable to use turnover as the sole financial criterion, in particular because enterprises in the trade and distribution sector have by their nature higher turnover figures than those in the manufacturing sector
> (European Commission 2003, L 124/36).

A further stipulation of the European commission definition of an SME is that the enterprise is autonomous. Autonomy is defined as: (1) being totally independent, or

(2) the firm owner holding less than 25% of the capital or voting rights (whichever is higher) in one or more other enterprises and/or outsiders do not have a stake of 25% or more of the capital or voting rights (whichever is higher) in the enterprise. Even if the 25% threshold is reached or exceeded, the firm is still considered autonomous if the following investors have a stake of no more than 50% in the firm; public investment corporations, venture capitalists and business angels, universities and non-profit research centres, institutional investors, and autonomous local authorities (European Commission 2003).

The definition formulated by the European Commission (2003) was designed to implement efficient measures and programmes to support the development and success of SMEs. Increasingly adopted by academic researchers in seeking a common acceptable definition, it is especially beneficial in conducting cross-country European studies. Whilst use of this definition can be criticised on the basis that it is primarily based on employment criteria and "... all-embracing" (Storey 1994b, p. 14); and that it ignores much of the inter- and intra-industry variation that the Bolton Committee (1971) statistical approach attempted to capture; it provides a "workable," straightforward, uncomplicated definition. Additionally, it is generally easier to access employment data than more sensitive information, such as profitability or gross sales turnover. A summary of parameters of the definition is outlined in Table 1.5.

Even though researchers in the European context generally employ the definition formulated by the European Commission (2003), these parameters are not adopted by researchers worldwide. The Small Business Administration (SBA) in the US, for example, classifies small business size standards by North American Industry Classification System Codes (NAICS). Size standards are determined by two measures; annual receipts in millions of dollars, or number of employees. Whilst there are differences depending on NAICS code, a commonly used measure is an upper limit of 500 employees (Berger and Udell 1998). Further diversity in definitions is observed in other countries. For example, in Australia a small firm is variously defined as having up to 20 employees in the services sector, but up to 100 employees in the manufacturing sector. Consequently, it is difficult to make precise international comparisons employing country-specific studies.

Table 1.5 Classification of non-primary enterprises by size in the European Union

Size Class	Number of employees	Annual turnover	Annual balance sheet total
Micro	0–9	≤ €2 million	≤ €2 million
Small	10–49	≤ €10 million	≤ €10 million
Medium	50–249	≤ €50 million	≤ €43 million
Large Sized Enterprises (LSEs)	250+		

Source: European Commission (2003)

The emergence of standard parameters within which SMEs are defined in the European Union has greatly improved research in the field, particularly in terms of cross-country comparability of results. It also alleviates the distraction of having to engage in long discussions in journal articles regarding the precise definition of an SME. These definitions are not static, however, and will change constantly to reflect changes in economic conditions, productivity, and technological change. Storey (1994b, p. 16) concludes by saying that "... there is no uniformly satisfactory definition of a small firm," and that "... in practice, researchers have to tailor their definitions of a small firm according to the particular groups of small firms which are the focus of their interest." In common with recent and current literature in the field, the definition employed in this book is the recommendation of the European Commission (2003).

1.3 Emergence of the Research Subject

A belated realisation of the significant economic contribution of SMEs has resulted in increased attention focussed on the sector from policy makers and academics. The earliest studies investigating SME financing predominantly comprised government sponsored surveys and reports, concentrating largely on potential deficiencies and obstacles to the sustainability and development of the sector. Policy makers were interested in implementing initiatives to boost levels of entrepreneurship and increase the number of start-ups. These studies were not implemented uniformly across countries, and research was predominantly concentrated in the US and UK. Research on SME financing in the UK, for example, has a relatively long history. Successive governments have shown a commitment to researching the sector, evidenced by detailed and comprehensive reports such as the report of the MacMillan (1931), the Radcliffe Commission (1959), the Bolton Committee (1971) and the Wilson Commission (1979). These reports addressed the provision of finance to firms in the sector, among other issues, and identified a shortage of financing for start-ups and those firms wishing to expand, what was later termed a "financing gap" in the sector. Whilst conclusions of these reports differed – the MacMillan Commission (1931) maintained that SMEs had difficulty in acquiring small amounts of equity, although the Bolton report (1971) explicitly stated that it did not support the provision of finance to small firms at subsidised rates, apart from four exceptional cases – they were instrumental in shaping and influencing policy.

Academic research on SME financing is a relatively more recent topic of investigation, and extends over a wide range of disciplines, including geography, economics, entrepreneurship, finance, industrial organisation, and psychology. Research on the subject over such a breadth of disciplines reveals the complexity and multi-faceted nature of SME financing, although a consequence of this interdisciplinarity is that research is extensive and somewhat disjointed. Emergence of SME financing as an established field of academic research is witnessed by the

growing number of journals dedicated to publishing articles on the subject, including *Small Business Economics, The Journal of Entrepreneurial Finance, Venture Capital: An International Journal of Entrepreneurial Finance, The Journal of Business Venturing*, *The Journal of Small Business Finance,* and *The Journal of Entrepreneurial Finance and Business Ventures*. Articles on small business financing also feature regularly in journals such as *The International Small Business Journal, The Journal of Small Business Management, The Family Business Review, Entrepreneurship Theory and Practice, Entrepreneurship and Regional Development,* and *The International Journal of Entrepreneurial Behaviour and Research*. The financing of SMEs and related topics are also addressed in established journals such as *The Academy of Management Review, Financial Management, The Journal of Financial Economics, Applied Financial Economics, The Review of Economics and Statistics, The Journal of Economic Surveys, The International Journal of Industrial Organisation, The Review of Economics and Statistics, Economics Letters,* and *The Journal of Corporate Finance*. Occasionally a finance journal special issue is devoted to the subject of SME financing, such as the *Journal of Banking and Finance (1998)*, 22 (6–8). Expansion of the breadth and scope of small business research is also evident in the growth of dedicated annual SME conferences worldwide, hosted by organisations such as the Institute for Small Business Research, the International Small Business Congress, the American Organisation for Entrepreneurial Finance, the RENT (Research in Entrepreneurship and Small Business) conference, and the Babson conference hosted by Kelley Business School. This recent expansion in research activity in the field has resulted in a significant corpus of material on the subject, although this in itself has introduced issues regarding quality, coherence, and comparability.

The earliest academic papers concerning SME financing were largely descriptive, and primarily considered differences between SMEs and large firms (Walker and Petty 1978; Bates and Hally 1982; Ang 1991). These papers described general differences between small and large firms, including ownership and management structures, financing and access to capital markets, and were not concerned with theory generation or theory testing, per se. Literature that subsequently emerged was dominated by issues related to the supply of adequate finance to the sector (Hall 1989; Levenson and Willard 2000). These papers commonly made reference to the relative disadvantages faced by SMEs in raising debt or equity finance compared with large companies (Reid and Jacobsen 1988). Provision of debt finance to SMEs has been the subject of many studies, and debate regarding the supply of adequate debt to the sector has polarised into two opposing perspectives. Stiglitz and Weiss (1981) propose that there is inadequate supply of debt finance to the sector, and resulting underinvestment means that equity is the equilibrium source of finance. Conversely, De Meza and Webb (1987) contend that overlending results in investment in excess of socially efficient levels, and that debt is the equilibrium source of finance. Numerous studies have empirically investigated the presence or otherwise of a market failure in debt markets, or credit rationing, and conflicting evidence supports both standpoints. Parker (2002) considers both views at length, concluding that:

> While credit rationing is impossible to reject on theoretical grounds, human ingenuity at devising rich and specialised contracts can be expected to reduce the scope for its emergence; and its empirical relevance appears to be rather limited at best
>
> (Parker 2002, p. 189).

Quoting a high variation between rates of venture capital investment in the UK and US, Parker (2002) suggests that instead of market imperfections in the supply of debt to the sector, there may be an insufficient supply of equity to the sector. This was suggested as far back as the report by the MacMillan (1931), although Storey (1994b) contends that the sums of money involved are actually much less today. Storey (1994b) concludes that government intervention in equity markets is neither justified nor necessary as there is little evidence of market failure. This view is shared by the British Venture Capital Association (BVCA) (2003);

> The BVCA asserts that there is a deficiency of compelling evidence to demonstrate the existence of a market failure in the VC market and contends that the real problem is not a lack of capital, but a lack of 'investor ready' companies appropriate for venture capital
>
> (British Venture Capital Association, 2003).

Much previous research on the financing of SMEs, therefore, is focussed on the provision of adequate finance to the sector, addressing the role of exogenous agents and factors in financing the firm. Whilst consideration of the issue of supply of finance is interrelated with factors endogenous to the firm, such as creditworthiness (Levenson and Willard 2000) and the substitution of human capital for financial capital (Reid 1996), a substantial number of studies investigating the financing of the sector concentrate on supply-side issues. The collective evidence from these academic and policy studies resulted in the provision of supports, such as the introduction of the Loan Guarantee Scheme (LGS) in the 1980s (Hughes 1997), for example.

The lack of attention afforded explanations for observed financing choices ignores potentially important aspects of financing SMEs that could mean improvements in the efficient and effective supply of resources to the sector. Essentially, an understanding of determinants of sources of finance employed by SMEs could greatly improve knowledge of the sector, and improve provision of finance. Furthermore, consideration of a firm's financing requirements and preferences at various stages in its development, or along its life cycle, could promote rates of survival in the sector and improve sustainability. Indeed, the critical issue may not be how to increase the supply of finance to SMEs, but to examine "... why they choose to seek external finance in the first place" (Berggren et al. 2000, p. 233).

The paucity of research investigating determinants of SME financing has been somewhat satisfied in recent years. Similar to the emergence of policy research, these studies first emerged from the UK (Chittenden et al. 1996) and the US (Balakrishnan and Fox 1993), and in recent years studies have been conducted in Portugal (Esperanca et al. 2003), Belgium (Manigart and Struyf 1997; Heyman et al. 2008), Spain (Sogorb Mira 2005; Garcia-Teruel and Martinez-Solano 2007), Italy (Giudici and Paleari 2000), Sweden (Cressy and Olofsson 1997b; Berggren et al. 2000), Taiwan (Fu et al. 2002), India (Ghosh 2007), Germany (Fritsch 1993;

Audretsch and Elston 1997; Elsas and Krahnen 1998), Australia (Cassar and Holmes 2003; Fitzsimmons and Douglas 2006), Greece (Daskalakis and Psillaki 2008) and Ireland (Mac an Bhaird and Lucey 2010). These empirical studies typically investigate firm characteristic determinants of SME financing by testing propositions of capital structure theories developed in the field of corporate finance. Results from these studies suggest a number of similar cross-country factors in financing SMEs, although combined results have not yielded a comprehensive explanation of capital structure choice. Alternative approaches examine the influence of strategic and managerial choice on the sources of financing employed (Barton and Gordon 1988; Scott and Rosa 1996). This approach propounds that firm-owner centred factors, such as characteristics, motivations, and preferences have a significant bearing on the capital structure of the firm. Whilst this method may provide more complete explanations for financing choice in SMEs and increase understanding of SME capital structure, published studies exploring this angle are rare (Michaelas et al. 1998). Studies employing a combination of both approaches are even more uncommon (Jordan et al. 1998).

There are two points of note about the "state of the art" in the field; firstly, a consistent, accepted theoretical explanation for firm financing has not emerged from "firm characteristic" multivariate investigations. Secondly, a lack of published studies combining the latter approach with investigations of the influence of firm owner preferences and motivations means that a satisfactory explanation for SME financing has not been developed. There is thus a gap in the literature for a study combining these two approaches, i.e. there is a need to combine results of multivariate statistical tests at the level of analysis of the firm with evidence from the level of analysis of the firm owner, focussing on firms from the same sample. This book aims to partly reduce this deficit in the literature by considering results of multivariate statistical tests in combination with evidence of financing preferences and objectives to investigate a holistic explanation of observed capital structures.

1.4 Previous Research on Financing Irish SMEs

The level of research on financing the SME sector in the Republic of Ireland is not commensurate with its relative macroeconomic significance. A number of reports recognise the importance of developing and supporting a strong, well-financed, independent SME sector. The National Economic and Social Council (NESC), in its review of "Policies for Industrial Development" stated that "... industrial policy should focus on promoting the development of businesses which would have the capacity to survive and grow in internationally competitive markets" (NESC 1984, p. 3). They identified the "... lack of a strong indigenous internationally traded industrial base," which they attributed partly to the financial structure of firms (NESC 1984, p. 3). Additionally, the relative dependence of the Irish economy on Foreign Direct Investment (FDI) reflects the economic vulnerability (especially of the manufacturing sector) in the event that these firms choose to relocate to

countries with more attractive economic conditions, such as lower wages. Policy makers identified the development and sustainability of a strong, independent SME base as an essential element in developing an alternative source of export income and in reducing dependence on the FDI sector for growth in employment and GVA. This factor was highlighted in the Culliton report (1992), and has even greater relevance today;

> Growth at macro-economic level is strengthened by heterogeneity at the micro-level. Economies and industries which are characterised by large numbers of small firms are found to be more reactive, innovative, competitive, and less volatile
>
> (Fitzpatrick et al. 2001, p. 6).

Similar to the trend of research in other states, the earliest studies of SME financing in the Irish context consisted of publicly sponsored surveys and investigations administered by government departments. One of the first such studies was the National Economic and Social Council (NESC 1984) report entitled "The role of the financial system in financing the traded sector." Focussing on the financing and financial structure of firms in the traded sector, it concluded that firms had difficulty in raising finance, particularly small amounts of equity capital. Thus, similar to the findings of the MacMillan report (1931) in the UK, the NESC 1984 report identified an "equity gap" in the sector. Findings of subsequent government investigations, namely the Department of Enterprise, Trade and Employment Equity capital surveys (1992, 1995, 2002) and the SME equity finance survey (Forfás 2006), reinforced and confirmed the view that firms experienced difficulties in sourcing relatively small amounts of equity capital. On the other hand, evidence supplied in a recent report by Mulcahy (2005) does not support these survey results and conclusions. Mulcahy (2005, p. 44) states that there is "... no compelling or quantitative evidence that an 'equity gap' exists." Citing five quantifiable indicators that the "equity gap" does not exist in Ireland, she contends that not only should there be no public intervention in the private equity market, but that the government should desist from its present practice of participating directly in the venture capital industry (by providing equity supports to client firms of government agencies). There has been no policy response to these conflicting findings, and neither has the policy of provision of direct and indirect supports changed in light of these findings. The net result is that government policy of providing supports for firms with the potential for high growth in employment and exports continues, regardless of potential deadweight or displacement effects (Lenihan 2002).

Whilst government sponsored surveys of the traded sector are conducted at regular intervals, academic studies on financing the sector are less numerous and less regular, and have concentrated on specific sectors. The two most notable Irish studies are an examination of fast growth firms by Kinsella et al. (1994), and an investigation of the financing of New Technology Based Firms (NTBFs) in the software product sector by Hogan and Hutson (2005). The study by Kinsella et al. (1994) replicates an earlier study by Storey et al. (1989) in the North-East of England, and investigates the financing (among other issues) of fast growth firms by comparing 40 fast-growth firms with 40 match firms in the Republic and North

of Ireland. Hogan and Hutson (2005) investigate financing in NTBFs by examining the financing preferences of 117 firms in the Irish software product sector. A number of other studies in the Irish context contain sections focussing on aspects of financing (Kennedy and Healy 1985), although no published study specifically examines the financing of the Irish SME sector employing a sample not confined to sector or geographical location. This deficiency was highlighted by Jones-Evans (1996) over a decade ago, but aside from Hogan and Hutson (2005), it has not been significantly addressed in the interim. The aim of the present study is to partly address this gap in the literature by investigating determinants of capital structures in Irish SMEs, employing a sample of firms representing a broad range of business activities.

1.5 Sources of External Finance Available to Irish SMEs

One of the potential impediments to the development of a strong, vibrant SME sector identified in the literature is the lack of access to external funds. This may arise because the "... domestic financial market contains an incomplete range of financial products and services" (OECD 2006). In addressing this question, it is instructive to briefly consider the Irish context and describe a number of external sources of finance accessible for investment projects. Although external sources of financing available to SMEs in the Republic of Ireland do not differ considerably from those available in other European countries, this brief account demonstrates the range of financial products available.

Debt finance: Sources of debt finance available to SMEs typically comprise short-term debt and long-term loans or mortgage finance from financial institutions with a high-street presence. The banking sector in the Republic of Ireland has undergone significant changes in the past decade. Prior to the 1990s, the Irish commercial banking market was dominated by a small number of domestic banks. The entry of a number of foreign financial institutions has increased competition in the sector, although this has not necessarily translated into a greater supply of finance, lower rates of interest, or less onerous collateral requirements (McCarthy et al. 2002). Possibly of greater impact is the recent Irish Banking Federation Business Account Switching code (IBF 2006) that came into operation in July 2006. Short-term financial products offered by financial institutions to SMEs typically include bank overdrafts and invoice discounting. Short-to-medium products include term loans, bridging finance, and leasing options, and long-term funding typically comprises commercial mortgages and loans collateralised with fixed assets. It is difficult to ascertain an exact figure for SME lending, as publicly available Central Bank data does not categorise commercial lending by size of enterprise. More importantly, official records do not include the personal short- and long-term debt of the firm owner and other sources of bootstrap finance which account for a substantial portion of SME funding (Winborg and Landstrom 2001; Ekanem 2005). Short-term sources of personal debt commonly employed by firm

owners to fund SMEs include personal credit and debit card accounts of the firm owner. Long-term personal debt supports to the firm include provision of personal assets and personal guarantees to secure business debt. The present study addresses this deficit by collecting data on personal sources of equity of the firm-owner invested in the firm, as well as data on personal assets provided as collateral for business loans. A further source of debt finance for SMEs are loans provided by external investors. Whilst this informal source of funding generally does not appear on the firm's balance sheet, it may have similar features of debt finance from financial institutions as it is repayable with interest. In this way, it differs from equity injections from informal investors, friends, and family.

External equity finance: External equity finance available to SMEs in the Republic of Ireland includes formal and informal sources. Formal sources include: obtaining a stock market listing, sourcing equity from private funders, such as venture capitalists, business angel or private investor networks; or sourcing equity from public sources of venture capital, such as government grant and support programmes. Informal sources of equity typically comprise finance sourced from friends and family, and exceed "classic" venture finance as the main source of capital for start-up companies, even in the US which is considered the most advanced economy in the world in the provision of venture capital (Bygrave and Quill 2007). Informal sources of investment finance equalled approximately 1% of Ireland's GDP in 2006, and friends and family (or "f" connections) were the most important sources of informal equity (Fitzsimons and O' Gorman 2007). This pattern is detailed in Table 1.6, and is similar to that of other countries.

Formal sources of equity funding from business angel and private investor networks are often the most significant and critical sources of financing at the seed and early stages of business development (Sormani 2006). The small number of formal Business Angel Networks (BANs) operating in the Republic of Ireland, such as the Halo Business Angel Partnership, suggest that they are not as important in the Irish context as they are in other countries, such as the UK for example. The opinion of Morgan Pierce, founder of the "Horsepower Funding" business angel network which closed down in early 2000, is that as Ireland is such a small market "... that it was easy for those people who needed funding to get to the people they need to get to" (Sormani 2006, p. 55). Furthermore, there are alternative means of investment for private investors, such as the Business Expansion Scheme (BES), which may be more attractive than a BAN because of the tax advantages it conveys to financiers. Individual investors in the BES scheme can obtain income tax relief

Table 1.6 Informal investor's relationship to investee in the Republic of Ireland, 2006

Close family	48%
Other relative	12%
Work colleague	10%
Friend or neighbour	24%
Stranger	5%
Other	2%
Total	100%

Source: Fitzsimons and O' Gorman (2007, p. 11)

on investments up to a maximum of €150,000 per annum in each tax year up to 2013 (Irish Revenue Commissioners 2007). SMEs engaging in specified sectors and activities qualify for the scheme, and the maximum investment in any one company or group of companies is €2 million. In the 10 years to May 2007, 1,364 firms sourced capital for expansion from over 24,000 investments (Mc Nally 2007). It is, therefore, an important source of equity capital for specific categories of Irish SMEs.

Another formal source of equity funding is venture capital advanced by private funds. Notwithstanding the frequent observation that European venture capital markets are less well developed than the venture capital market in the US, there are a large number of formal sources of venture capital available to Irish SMEs, a number of which are listed in Table 1.7. Whilst the amount of equity capital available for investment in the sector is prone to fluctuations (such as the decrease in funds available in the post dot-com boom in 2001, for example), evidence suggests that equity funding is readily available for "viable" positive NPV investment projects. Irish venture capitalists have a preference for investing in the technology sector, and investments made in high-tech companies as a percentage of total venture capital averaged 70% in the period 1998–2002 (Mulcahy 2005), 90% in 2004 (Pricewaterhouse Coopers 2005), and 96% in 2005 (IVCA 2006). Irish venture capitalists also invest a greater percentage of funds in seed and early-stage companies (an average of 50%), compared with firms in Europe (45%) and the US (39%) (Mulcahy 2005).

A notable feature of investment practices of Irish venture capitalists is the relatively small amounts of equity capital in the investment range. Mulcahy (2005) contends that Ireland has one of the smallest deal sizes (approximately €750,000), compared to the European average (€2.5 million) or the US average (€10 million). During 2007, for example, 48% of financing transactions of Irish Venture Capital Association (IVCA) firms were for amounts less than €750,000 (IVCA Techpulse 2007). Mulcahy (2005) concludes that Irish firms are more successful at raising small amounts of risk capital relative to firms in other markets. Other formal sources of venture capital available to Irish SMEs are funds from Enterprise Ireland and Invest Northern Ireland. Enterprise Ireland provides venture capital funding to firms directly in exchange for ordinary or preference shares, and also indirectly by investing resources into domestic venture capital funds through seed and venture capital programmes (effectively "buying in" investment expertise). Under the seed and venture capital programme 2000–2006, Enterprise Ireland committed €98 million to 15 funds to develop the venture capital market for SMEs. Since the establishment of the 2001–2008 venture capital scheme, the partnership funds have invested €250 million in 116 companies, with 81% of the total capital invested in companies at the seed and early-stages of development. Enterprise Ireland has committed to investing a further €175 million in the venture capital sector for the period 2007–2012 (Enterprise Ireland 2006). Along with providing venture capital both directly and indirectly to SMEs, Enterprise Ireland provide grants and financial support to manufacturing and internationally traded services companies linked to growth in exports, productivity and employment. Firms

Table 1.7 Sources of venture capital in Ireland, 2007

Fund	Fund size	Investment range	Sectors
4th Level Venture University Seed Fund Limited Partnership	€17 m	€75,000–€500,000	Life sciences, technology, and ICT
ACT Venture Capital Ltd.	€200 m	€750,000–€15 m	ICT, medical devices, life sciences
AIB Seed Capital Fund	€30 m	Up to €500,000	Seed and early stage companies
Alchemy Partners	€1.4 bn	€25 m +	All
Anglo Irish Capital Partners Ltd	€50 m	€1–€5 m	MBOs, MBIs
Atlantic Bridge Ventures	€100 m	Up to €15 m	Semiconductor technologies
Bank of Scotland Venture Capital	Unlimited	€1–€10 m	All sectors
Clarendon Fund Managers	£10 m and £3 m	£50,000–£700,000	High-growth sectors
Crescent Capital	£36.5 m	£250,000–£1.5 m	Manufacturing, tradeable services and IT
Delta Partners	€250 m	€0.5 m +	ICT and health care
Dublin Business Innovation Centre	€36.5 m	Up to €250,000	Technology-led IT, telecoms
Enterprise Equity Venture Capital Group	€22 m	€250,000–€1.5 m	All sectors except property
Enterprise Equity Venture Capital Group AIB Seed Capital Fund	€30 m	€250,000–€500,000	All sectors except property, retail and hotels
ETV Capital Ltd.	€150 m	€1–€15 m	Life sciences, material sciences
EVP Early Stage Technology Fund	€10 m	€400,000–€800,000	HPSU's in ICT sector
Glanbia Enterprise Fund	€6.5 m	€250,000–€500,000	Food related sectors
Growcorp Group	N/A	Up to €10 m	Life/biosciences
Intel Capital	No limit	€1–€500 m	Communications, enterprise platforms.
Ion Equity Ltd	Bespoke fund	€50–€500 m	Energy, Infrastructure, General
Kernel Capital Managers	€100 m	€750,000–€10 m	All, except property
NCB Ventures	€27 m	€500,000–€1.25 m	ICT, life sciences
Powerscourt Investments	N/A	€250,000–€5 m	Communications, General
Qubis Ltd.	N/A	£10,000–£50,000	Early stage technology
Seroba Bioventures	€20 m	Up to €3 m	Therapeutics, biotechnology
TVC Holdings Plc	N/A	Up to €40 m	All
University Challenge Fund	£2.75 m	£50,000 to £100,000	Seed-technology related
UU Tech Ltd.	N/A	£20,000–£250,000	Incubators and IP
Western Development Commission	€34.4 m	€100,000–€1 m	All

Source: Information extracted from "A guide to venture capital," 4th Edition (IVCA 2007)

targeted for this investment include High-potential Start-Up companies (HPSUs) and SMEs building international competitiveness. Similar state supports are provided to firms in the mid-West by Shannon Development and in Gaeltacht regions by Údarás na Gaeltachta. Additional grants and financial supports are provided under various categories by a range of agencies and government departments.

The abovementioned detail suggests that SMEs wishing to employ external equity have access to a wide variety of indigenous private and public sources of venture capital. Despite the availability of equity funds, investment of venture capital in Ireland is relatively low by international standards (O' Brien and O' Loughlin 2006), totalling an average 0.11% of GDP for the period 2001–2004 (Pricewaterhouse Coopers 2005). (A number of reasons for this seeming aversion to use of formal sources of external equity were divulged by firm owners, and are presented in Chap. 4).

A further source of equity capital is to seek a stock exchange listing. This source of finance is typically accessed after a number of rounds of equity financing from a venture capitalist or other private equity source. Public markets most commonly accessed by SMEs in the Republic of Ireland are the Alternative Investment Market (AIM), a sub-market of the London Stock Exchange, and the Irish Enterprise Exchange (IEX). Obtaining a stock exchange listing is a relatively costly means of raising finance, and is even more costly for SMEs (Ibbotson et al. 2001). The "new" markets (AIM and IEX) are more attractive for SMEs, as the cost and regulatory requirements for obtaining a listing are less onerous. The AIM, launched in 1995, is a highly liquid market and has been an important source of capital for Irish SMEs going public. For example, between 2000 and 2004 14 Irish companies listed on AIM (Walsh 2005). This was partly due to the lack of a similar Irish index, and the IEX was launched on 12th of April 2005 by the transfer of 8 firms from the Exploration Securities Market (ESM) and the Developing companies market (DCM) of the Irish stock exchange. The IEX is designed especially for SMEs, and it has grown to 30 firms since inception, including eight new entries in 2007 (Irish Stock Exchange 2007).

1.6 Conclusion

A primary rationale for conducting research on firms in the SME sector is their significant economic contribution in terms of number of enterprises, employment, regional development, innovation, and GVA at factor cost. The employment contribution is particularly resonant in the Irish context given high unemployment rates in the 1980s, and rapidly increasing unemployment rates at present. Maintenance of a strong and sustainable small business sector is desirable for the many positive economic benefits it bestows and has been a focus of governments concerned with employment, innovation, and economic growth. Development and expansion of a strong SME base is dependent on adequate financing and capitalisation of firms in

the sector. Academic and policy literature has been primarily concerned with the efficient provision of resources to the sector, and studies frequently refer to the difficulty of SMEs in sourcing adequate finance. The focus of research on market efficiency and supply of finance to the sector has resulted in less attention afforded to determinants of capital structures, including requirements and preferences of firm owners. Consideration of these factors could promote sustainability and rates of survival in the sector, and result in more appropriate targetting of supports to SMEs, if indeed such support is appropriate or necessary.

This study investigates the financing of the small business sector from the perspective of the firm owner, describing and analysing resources employed, as well as detailing funding preferences and requirements. The research objectives of this study are summarised in three specific research questions posed at the outset: (a) Do sources of finance employed by SMEs change across age profiles?; (b) Are sources of finance employed by SMEs determined by firm characteristics?; and (c) What are firm owners' goals and preferences when considering the financing decision?. This book is organised according to the research questions raised, with each question addressed in successive chapters. These questions are revisited at the end of the book in appraising research findings with reference to the original research objectives.

Chapter 2
SME Financing: A Life Cycle Approach

Small business may be thought of as having a financial growth cycle in which financial needs and options change as the business grows, gains further experience, and becomes less informationally opaque. [This is modelled] in a stylized fashion in which firms lie on a size/age/information continuum

(Berger and Udell 1998, p. 622)

2.1 Introduction

The means of finance employed for positive net present value (NPV) projects has important implications for the firm. The cumulative effect of these discrete financing decisions results in the capital structure of the firm, composition of which has long been a focus of research in the corporate finance discipline. Theoretical discourse on the subject originates from the irrelevance propositions of Modigliani and Miller (1958), stating that the capital structure of the firm is independent of its cost of capital, and therefore of firm value. This has spawned a substantial body of theoretical literature and empirical tests, which have focused primarily on the decision to employ debt or equity for investment projects. These studies focus on subjects of agency, signaling, and taxation, typically examining the incremental financing decision.

Researchers conducting empirical investigations of SME capital structures adopt theoretical approaches developed in the field of corporate finance. These studies commonly examine determinants of financial resources employed by firms, linking them to firm or owner characteristics (See Appendix B for a review of this literature). Data employed in empirical tests is typically cross-sectional, and firm financing is modelled as a continuous process. Whilst these approaches are valuable, they largely ignore the issue of the sources of finance employed by a firm at various stages of its life cycle, and how the combination of financing changes and evolves across stages of development. This is a very important omission, as a firm's funding requirements

C. Mac an Bhaird, *Resourcing Small and Medium Sized Enterprises*,
Contributions to Management Science,
DOI 10.1007/978-3-7908-2399-8_2,

vary significantly over the course of its life cycle, along with access to various sources of financing. An advantage in adopting this approach is that it details the most important sources of finance at each stage of a firm's life cycle, facilitating identification of potential funding gaps at various points in a firm's development.

In this chapter, the financial growth life cycle model is described, and empirically examined by conducting a number of bivariate statistical tests. Capital structures of 275 firms are categorised by five sources of equity and two sources of debt, and presented across six age groups. This statistical treatment facilitates an examination of changes in sources of financing employed over time, particularly changes in proportions of finance sourced "inside" and "outside" the firm as it develops and matures. Furthermore, comparison of sources of finance employed at start-up with those employed at present illustrates how respondents' capital structures evolve over time. In employing a combination of statistical tests on firms' capital structures, the concern of testing a life cycle effect with cross-sectional data is partly ameliorated. Data and results are presented in tabular form throughout the chapter. A detailed profile of respondent firms is provided in Appendix A, contextualising results and analysis presented in this chapter.

2.2 Life Cycle Theory of the Firm

The stage model or life cycle theory of the firm originates in economics literature (Penrose 1952, 1959; Rostow 1960), and is commonly used to describe the progression of the successful firm through growth phases. A biological analogy is sometimes used to describe "...the cyclical quality of organisational existence. Organisations are born, grow, and decline. Sometimes they reawaken, sometimes they disappear" (Kimberly and Miles 1980, p. ix). Penrose (1952, p. 806) disagrees with applying biological analogies to the life cycle theory of the firm, however, as "... the development of firms does not proceed according to the same 'grim' laws as does that of living organisms". The stage model or firm life cycle approach describes the development of the firm as a linear sequential process through a number of stages. Numerous stage models have been developed, particularly in the management and organisational studies literature. As evidenced by summaries presented in D' Amboise and Muldowney (1988) and Poutziouris (2003), the number of stages is not standardised. For example, Steinmetz (1969) proposes a model based on three phases of growth, whilst Greiner (1972) proposes a five-stage "evolution-revolution" model, with each stage separated by "revolutionary change". In deriving a taxonomy of growth stages for high-technology organisations, Hanks et al. (1994) identify common developmental stages based on the comparison of a number of stage models, namely start-up, expansion, maturity, diversification, and decline stages. Specifying age categories for each developmental stage in a universal life cycle model is difficult because of intra industry differences. Attempts to assign specific age groups thus tend to be confined to particular sectors (Hanks et al. 1994).

Table 2.1 The financial life cycle of the firm

Stage	Sources of finance	Potential problems
Inception	Owners' resources	Undercapitalisation
Growth I	As above plus: Retained profits, trade credit, bank loans and overdrafts, hire purchase, leasing	Overtrading, liquidity crises
Growth II	As above plus: Longer term finance from financial institutions	Finance gap
Growth III	As above plus: New market issue	Loss of control
Maturity	All sources available	Maintaining Return On Investment (ROI)
Decline	Withdrawal of finance: Firm taken over, share repurchase (US), liquidation	Falling ROI

Source: Weston and Brigham (1970, p. 157)

Similar to the stage model developed in organisational studies literature, the financial life cycle theory of the firm developed in corporate finance identifies a number of stages in a firm's development. Presented as a descriptive concept in early textbooks such as Weston and Brigham (1970), it outlines sources of finance typically available at various growth stages of the firm, along with potential financing problems that may arise at each stage, and is reproduced in Table 2.1. The financial life cycle model incorporates elements of trade-off, agency, and pecking order theories, and describes sources of finance typically advanced by funders at each stage of a firm's development.

At start-up, the commonly held view is that firms have difficulty accessing external finance due to information opacity (Huyghebaert and Van de Gucht 2007). The most important and commonly-used sources of finance at this stage are personal savings of the firm owner, and finance from friends and family members (Ullah and Taylor 2007). The contribution of the firm owner in nascent firms is not confined to equity, but commonly includes the provision of quasi-equity in the form of personal assets used as collateral to secure business debt (Basu and Parker 2001). Whilst a firm may obtain sufficient capital to initiate trading, a lack of planning may lead to problems of undercapitalisation in the earliest stages. In extreme cases, particularly in the face of competition, the firm may not be able to continue in business (Cressy 2006b).

As successful firms survive nascent and start-up phases, and mature through growth stages, personal funding becomes relatively less important as investment finance is increasingly sourced from retained profits. Furthermore, accumulation of a trading history facilitates access to increased sources and amounts of external financing, particularly bank financing and trade credit. Rapidly expanding firms lacking adequate working capital to meet increased costs may experience liquidity problems at this stage (Bates and Bell 1973). Firms faced with the problem of overtrading often seek to alleviate these liquidity problems by increasing their overdraft facility. Thus, it is common for SMEs to have high levels of short-term debt (Michaelas et al. 1999; Ayadi 2008). Short-term debt is neither sufficient nor appropriate for firms requiring large amounts of additional external finance for

investment, however. These requirements are more suitably fulfilled by long-term debt, or by raising external equity through a private placement or an initial public offering of common stock. Firms requiring large amounts of external equity are characterised by the pursuit of a high growth strategy, and may be involved in the development of products or services based on new technology, such as NTBFs for example (Ullah and Taylor 2005). A consequence of the sale of firm equity for the owner is loss of control and managerial independence, although a number of authors indicate that this outcome may be compatible with the firm owner's goals (Berggren et al. 2000; Hogan and Hutson 2005). On reaching maturity, firms have acquired a trading history, and typically have access to a broad range of financing sources. Sources of finance accessed at this stage are generally determined by preferences of firm owners, rather than supply side restrictions. A number of firms may then enter a stage of decline due to diminishing returns (Steinmetz 1969), whereupon the firm may be liquidated or taken over.

2.3 Application of the Life Cycle Approach to the SME Sector

The financial growth life cycle model developed by Berger and Udell (1998) presents firms on a size/age/information continuum, and describes the increasing array of financing options available to the firm as it grows. Reproduced in Fig. 2.1, the model incorporates changes in availability of information and collateral in describing sources of finance available to firms over time. Berger and Udell (1998) thus conceptualise the sequencing of funding over the life cycle of the firm centred on information opacity and following a financial pecking order. Smaller, more informationally opaque firms are depicted to the left side of the continuum relying on "... initial insider finance, trade credit, and/or angel finance" (Berger and Udell 1998, p. 622). As firms advance along the continuum, they gain access to increased sources of external debt and equity capital. Ultimately, firms may access greater amounts of capital in public debt and equity markets. Similar to earlier approaches, the model does not specify age categories for each stage of development, nor does it consider truncation at any point in the life cycle. Unlike models such as Weston and Brigham's (1970), it does not specify stages of development of the firm, and whilst it includes a number of sources of external equity and debt not included in previous models, retained profits are not incorporated into the model.

Employing data from the 1993 National Survey on Small Business Finances (NSSBF), Berger and Udell (1998) present a description of US small business financing categorised by age and size groups, although they do not empirically test the financial growth life cycle model *per se*. Published empirical tests of financial life cycle models are rare, with a couple of notable exceptions (Fluck et al. 1998; Gregory et al. 2005). The former study finds that, contrary to predictions of the financial growth life cycle model, external sources of finance exceed internal sources for the youngest firms.

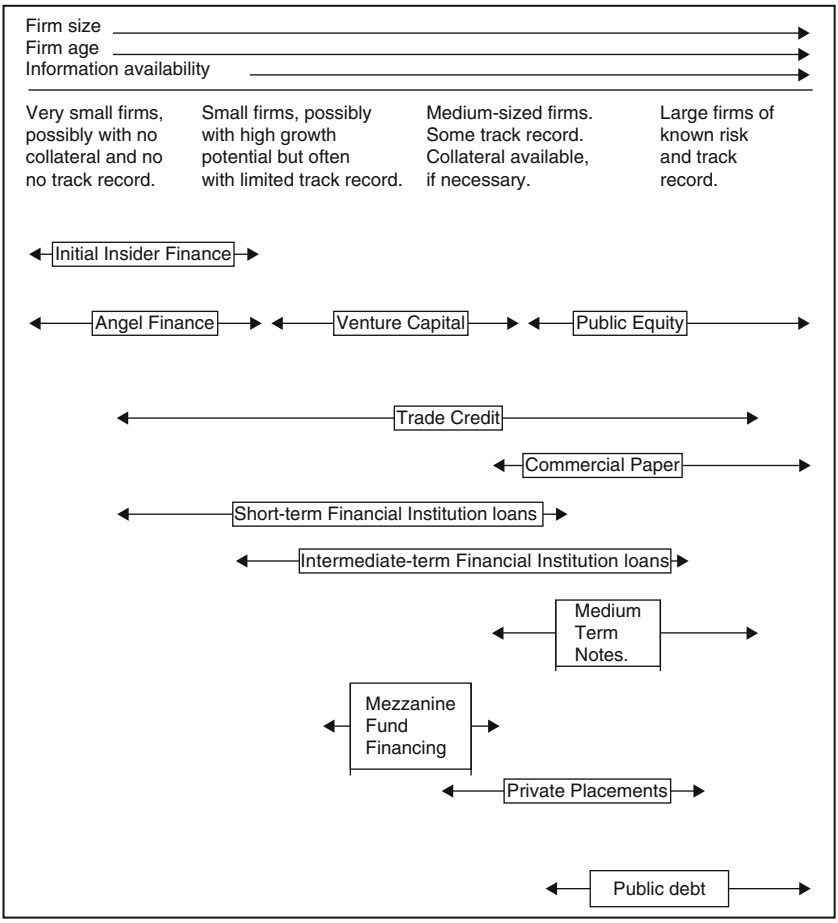

Fig. 2.1 Firm continuum and sources of finance
Source: Berger and Udell (1998, p. 623)

Furthermore, Fluck et al. (1998) find that the contribution of the firm owner increases initially and then decreases in firms over 12 years old. The initial increase in use of insider financing is explained by firm owners employing retained earnings for investment because of potential difficulties in raising external finance explained by the monopoly-lender theory (Rajan 1992). The subsequent decrease in use of internal sources is explained by older firms sourcing increasing amounts of external debt due to reputation effects (Diamond 1989). Gregory et al. (2005) conduct an empirical examination of Berger and Udell's (1998) model by testing a multinomial logistic regression model employing data collected in the 1998 NSSBF. Results from this study partially support the model, although Gregory et al. (2005) conclude that the financial growth life cycle of SMEs cannot be encompassed in a "one size fits all" universally applicable model.

2.4 Empirical Examination of the Financial Growth Life Cycle Model

In this section, financial and collateral resources employed by a sample of 275 firms are conceptualised through a financial growth life cycle model, and are presented and analysed employing a combination of bivariate statistical tests. Financing data of respondents is categorised by two sources of internal funding and six sources of external funding, and presented as a one-way Anova in Table 2.2. This data was requested in percentage form for a number of specific sources of finance, and yielded a high response rate of 275 useable responses from a total of 299 replies. This statistical treatment facilitates empirical testing of the financial growth life cycle proposed by Berger and Udell (1998, p. 623), and is similar to their presentation of capital structures, although they report absolute dollar amounts employing different age categories. The statistical significance of the independent variable, age, is assessed by examining the significance level of the F-test for the Anova. This test was similarly employed by Chandler and Hanks (1998) in examining differences in sources of finance employed across business sectors. Significance values less than 0.05 indicate that firms in at least one age category differ from other age categories in use of that source of funding. Precisely which age categories differ is explored further by means of one-way Anova post-hoc analyses in a following section.

One-way Anova analysis is based on two assumptions; firstly, that data (means) are normally distributed, and secondly, homogeneity of variances. Before conducting the Anova, a number of tests are performed on the data to examine the validity of these assumptions. Analysis of skewness and kurtosis values for sources of financing employed by firms (reported in Table 3.3) indicate that they are not symmetrically distributed. A one-sample Kolmogorov-Smirnov test was conducted to test the distribution of the data for normality. The Kolmogorov-Smirnov test compares an observed cumulative distribution function to a theoretical cumulative distribution, in this case the normal distribution. Significance values greater than 0.05 indicate that the observed distribution corresponds to the theoretical distribution. The significance values for this test were less than 0.001 for all sources of finance, indicating that the means of financing across age groups are not normally distributed. Violation of this primary assumption of Anova when analysing small samples means that a nonparametric alternative to the one-way Anova should be employed, such as the Kruskal Wallis Chi-Squared test. This is not necessary when using larger samples, because the central limit theorem states that the sampling distribution of the mean approaches a normal distribution as the sample size increases. Sample size in this study is 299 out of an eligible population of 702. Thus, although means are not normally distributed, a one-way Anova is an appropriate test to determine if means of financing differ between age groups.

The second assumption of Anova, homogeneity of variances, is examined by observing the significance value for the Levene statistic. Significance values greater than 0.05 imply that variances are equal and the assumption is justified. Results for

Table 2.2 One-way Anova of the sources of financing employed by respondents across age categories

Firm age (n = 275)	Internal sources of financing (%)		Total internal financing	External sources of financing (%)								Total external financing
	Personal savings of founder(s), funds from friends and family	Retained profits		Venture capital	Business Angels and private investors	Govt. grants and equity	Total external equity	Short-term bank loans and overdraft	Long-term debt	Total debt	Off balance sheet financing (leases,etc)	
<5 years	22	9	31	15	17	5	37	11	18	29	3	69
	(0.31)	(0.16)	(0.32)	(0.33)	(0.35)	(0.13)	(0.44)	(0.19)	(0.31)	(0.34)	(0.05)	(0.38)
5–9 years	15	27	42	16	8	5	29	19	7	26	3	58
	(0.22)	(0.34)	(0.36)	(0.29)	(0.18)	(0.08)	(0.35)	(0.32)	(0.15)	(0.33)	(0.08)	(0.39)
10–14 years	11	32	43	10	4	1	15	30	6	36	6	57
	(0.21)	(0.39)	(0.40)	(0.27)	(0.14)	(0.04)	(0.32)	(0.36)	(0.19)	(0.37)	(0.13)	(0.41)
15–19 years	12	43	55	4	2	0	6	24	10	34	5	45
	(0.26)	(0.40)	(0.41)	(0.14)	(0.07)	(0.01)	(0.15)	(0.27)	(0.26)	(0.36)	(0.08)	(0.37)
20–29 years	11	50	61	2	1	2	5	22	6	28	6	39
	(0.23)	(0.40)	(0.36)	(0.11)	(0.06)	(0.04)	(0.13)	(0.26)	(0.17)	(0.30)	(0.20)	(0.31)
>30 years	7	47	54	0	7	1	8	26	7	33	5	46
	(0.19)	(0.40)	(0.40)	(0.00)	(0.21)	(0.02)	(0.21)	(0.32)	(0.15)	(0.34)	(0.09)	(0.36)
Total	11	40	51	5	5	2	12	22	9	31	6	49
	(0.22)	(0.39)	(0.39)	(0.19)	(0.17)	(0.05)	(0.26)	(0.30)	(0.19)	(0.34)	(0.13)	(0.37)
One-way Anova F statistic	0.340	0.000***	0.005***	0.001***	0.060*	0.001***	0.000***	0.043**	0.014*	0.460	0.176	0.020*

***, **, * statistically significant at the 99%, 95% and 90% level of confidence respectively. Standard deviations in parentheses

the present study indicate significance values less than 0.03 in one case, and less than 0.001 in all other cases, indicating that the assumption of homogeneity of variance is violated. In this case, the Welch and Brown-Forsythe statistics are alternatives to the usual F test. As explained in the previous paragraph, as the sample size increases the distributions of these statistics converge to an F distribution. A one-way Anova was conducted rather than a non parametric technique because the sample size invokes the implications of the central limit theorem. A further consideration in using Anova is that it is quite insensitive to departures from normality and homogeneity of variances (Hair et al. 2006, p. 410).

Significance values less than 0.05 for the Anova F statistic indicate differences in sources of financing employed by one or more age groups. Analysis of F-test significance values in Table 2.2 indicate a statistically significant linear or non-linear relationship between age categories and all sources of finance except two, namely "personal savings of founder(s) and 'f' connections" and "off balance sheet financing". F-test significance values for all other sources of financing indicate differences in means of financing between age groups at the 95% level of confidence, signifying that at least one age group differs from the others. These differences are investigated further by conducting post-hoc multiple comparisons in a following section.

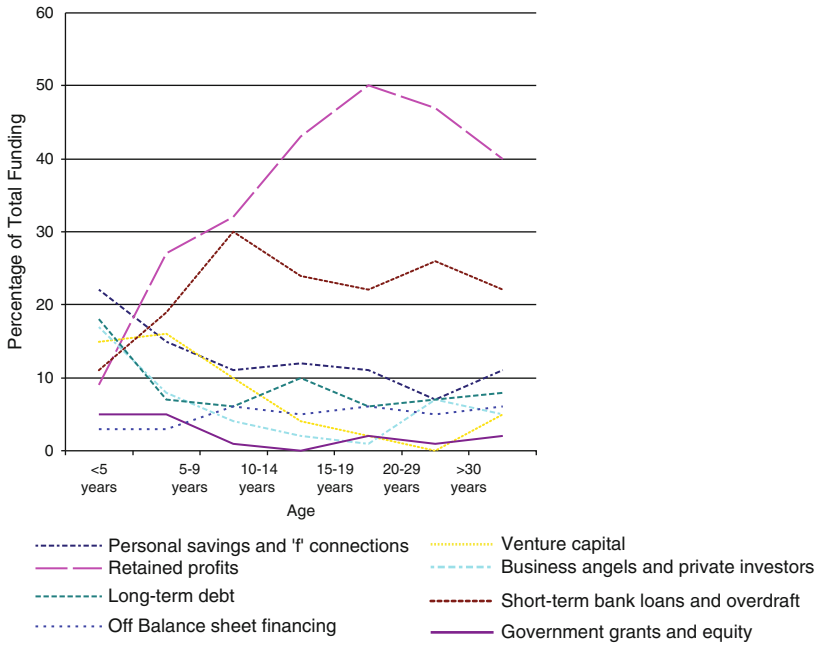

Fig. 2.2 Sources of finance presently employed by respondents

2.5 Distribution of Debt and Equity Across Age Groups

Data reported in Table 2.2 reveal distinct differences in sources of financing employed across age profiles. The proportion of financing sourced from internal and external sources is approximately equal for the total sample, an almost identical profile to that presented by Berger and Udell (1995). In this section, each source of finance is discussed in turn, along with how its use changes across age profiles.

The single most important source of capital for firms in the youngest age category are personal savings of the firm founder, and funds from friends and family. This finding is consistent with evidence detailing the importance of personal funds of the firm owner for nascent and early-stage firms (Berger and Udell 1998; Ullah and Taylor 2007). Respondents report a diminishing reliance on this source as age profiles increase. Proportionate use of personal savings and "f connections" is 50% lower in firms over 10 years old than it is among firms in the youngest age category. Decline in use of personal savings and "f" connections as a proportion of financing among respondents over time is accompanied by an increasing reliance on accumulated retained profits. Respondents' use of personal sources of funding of the firm owner is consistent with previous empirical evidence (Berger and Udell 1998), and emphasises two distinct features of SME financing; the importance of the owner's personal resources in the nascent stages of a firm's development (Fairlie 1999), and the significance of the risk taking propensity of firm owners in resourcing the sector.

Progressing through age categories, retained profits become a proportionately more important source of funding for respondents, and are the single most important source of finance for all firms except those in the youngest age category. Use of retained profits as a proportion of financing increases threefold from the youngest to the second-youngest age profile. Its use increases as a proportion of total financing for all firms less than 30 years old, peaking for firms aged between 20 and 29 years. Use of retained profits falls slightly as a proportion of financing for firms older than 30 years. The latter pattern may be attributed to declining profit margins for the most mature respondents. This result is consistent with empirical evidence from previous studies (Howorth 2001; Vos et al. 2007; Cole 2008), reiterating the primary importance of profitability in financing SMEs.

Observed increasing reliance on internal equity is consistent with the pecking order theory (Myers 1984; Myers and Majluf 1984), suggesting that respondents have a preference for internal sources of finance, which becomes increasingly available through the accumulation of retained profits. Reported sources of financing emphasise the fundamental importance of profitability in funding firms in the sector. Most important in the earliest stages of the firm is the extent of the personal resources of the firm owner and "f" connections, highlighting the importance of the wealth of the SME owner revealed by Evans and Jovanovic (1989) and Fairlie (1999).

External sources of financing are classified by three categories of external equity and two categories of debt, along with off balance sheet financing. External equity comprises venture capital, government funding, business angels and private

investors, and is of greatest importance to firms less than 5 years old. Venture capital is an important source of finance for 7% of respondents. Its use is most prevalent in firms aged less than 10 years, comprising 15% of capital structures in this age group. The relatively high use of venture capital reported by firms less than 5 years old may be unexpected, as venture capitalists typically do not invest in products and services in the earliest stages of development (Smith and Smith 2004); although Gompers (1995) and Berger and Udell (1998) note that venture capital may be used to finance product development costs in some cases. Respondents' reported use of venture capital reflects the high rate of investment by Irish venture capitalists in early-stage companies relative to both Europe and the US (Mulcahy, 2005). Another explanation for the relatively high reported use of venture capital by firms in the youngest age category is that it is accounted for by two respondents, comprising 90 and 100% of their capital structures. As this category comprises fifteen firms, these outliers have a disproportionately large effect on the overall result.

Firms aged between 5–9 years and 10–14 years report sourcing 16% and 10% of capital structure respectively from venture capitalists. Observed use of venture capital is consistent with the view that venture capitalists invest in companies with proven technology to finance "... full-scale marketing and production" (Berger and Udell 1998, p. 623). Outside these age categories venture capital is used by only two firms.

Nine percent of respondents report sourcing finance from business angels and private investors. This source of finance is particularly important for firms aged less than 5 years, comprising 17% of capital structure for firms in this age category. This result is consistent with empirical evidence from previous studies detailing the importance of angel and private investor finance for nascent and start-up firms (Berger and Udell 1998; Smith and Smith 2004). Use of finance from this source diminishes considerably in respondents with older age profiles.

Government grants and equity are used as a source of finance by 16% of respondents. Funds from this source comprise relatively small amounts, typically less than 10% of respondents' capital structure. Firms in the "computer software development and services", and both manufacturing sectors comprise 80% of those employing government grants and equity. This source is most important for firms in categories less than 10 years old, comprising 5% of their capital structure. Respondents' use of government grants and equity suggest that it is used by specific sectors and age groups. As detailed in Chap. 1, government grants to the manufacturing sectors include capital grants, and grants to export oriented firms. Government grants to the "computer software development and services" sector include high-technology equity grants and grants to export oriented firms with high-growth potential. These grants are typically accessed by firms in the earliest stages of development. Reported capital structures of respondents are consistent with this profile.

Use of debt is observed in two categories, namely short-term bank loans and overdrafts, and long-term debt. Respondents report an increasing use of short-term debt as age profiles get older, comprising an average 22% of capital structure for the total sample. Short-term debt is the second-most important source of funding after

retained profits, excluding the youngest age category. Use of short-term debt by respondents is lowest for firms less than 5 years old, comprising 11% of capital structures for firms in this age category. Its use is greatest in firms aged 10–14 years, comprising 30% of their capital structures, thus following an approximately convex pattern over age categories. The significant rise in use of short-term debt in the first three age categories is consistent with reputation theory (Diamond 1989), suggesting that respondents gain greater access to short-term debt finance as firms grow and mature and information asymmetries dissipate.

Excluding the youngest age category, use of long-term debt follows an approximate convex pattern, averaging 9% of financing for the total sample. Reported use of long-term debt is similar to previous research, including the oft-quoted finding of Ray and Hutchinson (1983), that a majority of SMEs do not employ this source of finance. Over 80% of firms reporting no debt are in the older age categories, revealing an increasing reliance on retained profits over time as long-term debt is repaid. Consistent with the pecking order theory, reported use of long-term debt in age categories other than the youngest is negatively related with age.

Long-term debt comprises 18% of the capital structure of firms less than 5 years old. This finding is contrary to the conventional wisdom that financial institutions advance long-term debt to very young firms (Berger and Udell 1998), although it is consistent with empirical evidence from previous studies (Fluck et al. 1998). Firms in the youngest age category reporting a high proportion of debt indicate that it is secured on the personal assets of the firm owner, and to a lesser extent by "other guarantors" (this is described in greater detail in the following section). These firms are primarily in sectors typified by low levels of collateralisable assets, namely the "computer software development and services" and "other services" sectors. This result emphasises the importance of the personal wealth of the firm owner in the entrepreneurial process highlighted by Evans and Jovanovic (1989) and Fairlie (1999). Not only do firm owners provide equity in the form of personal funds to the firm, they also contribute "quasi-equity" by providing personal assets as collateral to secure business loans. This contribution is commonly under-emphasised as it is not recorded on the firm balance sheet.

Eighty three percent of firms employing long-term debt are in sectors with asset structures typified by a high proportion of collateralisable assets, namely the "distribution, retail, hotels and catering" and both manufacturing sectors. This result is not unexpected, as financial institutions commonly require collateral to secure long-term debt (Black et al. 1996; Bartholdy and Mateus 2008; Heyman et al. 2008), which may result in inter-industry differences in capital structure (Hall et al. 2000).

Respondents' use of total debt averages at 31% of capital structures. Short-term debt and bank loans is the most important component, and firms make increased use of short-term sources as they progress through the life cycle from start-up to maturity. Long-term debt is a relatively less important source of capital, averaging at 9% of capital structure for the total sample. The relatively high use of debt by firms in the youngest age category is explained by provision of personal assets of the firm owner to secure that debt.

Lease finance comprises a relatively small proportion of capital structures of respondents, averaging at 6% for the total sample, as evidenced in Table 2.2. 30% of respondents employ lease finance, and it generally involves a small percentage of capital structure. Two thirds of respondents employing lease finance report that it comprises less than 10% of financing. Reported use of lease finance also differs across age groups. It comprises 3% of capital structure for firms less than 10 years old, half of the average for the total sample. This is a surprising finding, because younger firms would not be expected to be restrained in access to lease finance, as problems of moral hazard should not apply because title of the machinery and equipment typically remains with the lesser. The lower use of lease finance as a proportion of capital structure by the youngest firms in this study may be accounted for by the fact that 50% of firms in the two youngest age categories are in the "computer software development and services" sector, and lease finance is generally not an important source for these firms.

Use of alternative sources of financing, such as deferred taxes and trade credit are not reported in this study, thus similar to Fluck et al. (1998), use of external finance is possibly underreported. There are contrasting views in the literature as to the importance of trade credit as a source of financing. Reporting findings from the Nottingham University Small Firms Unit (1984), Binks et al. (1986) state that 55% of respondents were consistently required to issue more trade credit than they received, whereas 10% of firms were "net receivers" of trade credit. This is consistent with the view that large businesses are able to take extended trade credit from SMEs, particularly new firms (Wilson and Summers 2002).

By contrast, other studies highlight the importance of trade credit as a source of finance (Robb 2002), particularly for firms operating in poorly developed financial markets (Fisman and Love 2003). In the present study, respondents were requested to indicate "other" sources of financing, which were reported as less than 2%. This may be an indication that respondents are net "givers" of trade credit rather than net "receivers", which is consistent with empirical evidence detailing the relatively poor performance of Irish firms in late payment (Rafuse 1996). This is confirmed by analysis of data from the Bureau van Dijk Amadeus database, which reveals that collection days are considerably greater than credit days for Irish SMEs during this period.

There are a number of limitations with the preceding analysis, both in terms of the statistical test used, and assumptions of the financial growth life cycle model. Firstly, the one-way Anova compares means of sources of financing across age groups, ignoring potential differences in sources of finance used within age groups. Secondly, use of age as an independent variable does not account for other variables such as inter-industry effects, which may have a significant influence on sources of financing employed. Thirdly, the one-way Anova is computed on cross-sectional rather than longitudinal data, thus ignoring potential effects of changes in the external environment on sourcing finance. A related issue is that the financial growth life cycle model assumes that firms have access to all external sources of financing when required. These supply-side factors may have a significant influence on the means of financing chosen. Fourthly, although the age categories employed are similar to those used in previous studies, such as in LeCornu et al. (1996), they

are arbitrary, and so a 4 year old firm is in a different category to a 5 year old firm. Finally, this model depicts the financing of firms across age groups as a constant linear process. In reality SME financing may be a more "lumpy" or stochastic process. A related drawback is that the financial growth life cycle model as proposed by Berger and Udell (1998) suggests that the growth cycle of SMEs can be represented in a single universal model, ignoring not only differences in growth rates, but also differences in the availability and use of sources of capital. Age categories do not incorporate varying rates and stages of development and corresponding financing requirements across sectors, because diverse inter- and intra-industry differences in opportunities and rates of growth preclude categorisation of all firms by discrete values.

2.6 One-Way Anova Post-Hoc Analysis

Results of the one-way Anova presented in Table 2.2 describe the distribution of dependent variables across age categories, but do not identify precisely which age categories differ significantly. Statistically significant inter-group differences are investigated by conducting a number of one-way Anova post-hoc tests to make multiple pairwise comparisons. Post-hoc tests can only be applied when the omnibus Anova is significant, thus they were not performed on three sources of financing, namely personal savings of the founder and "f" connections, total debt, and off balance sheet financing. The post-hoc tests performed were determined by the data. Firstly, a one-way Anova test for homogeneity of variances was conducted to examine if variances of the groups were equal. Significance values in all cases indicated that variances for the age groups were unequal at the 95% level of confidence. In rejecting the assumption of equal variances, post-hoc tests employed were Tamahane's T2, Games and Howell's pairwise comparisons test, Dunnet's C, and Dunnet's T3 tests. Analysis of test outputs reveals significant differences between age categories in use of retained profits, government equity, venture capital, and short-term debt, but not for long-term debt, and business angels and private investors.

Anova post-hoc tests list pairwise comparisons of group means, reporting mean differences and the significance or probability that the population mean difference is zero. Mean differences at the 95% level of confidence are reported as significant. Examination of these results for use of retained profits indicates significant differences between firms in both youngest age categories and firms in both oldest age categories, as evidenced by significant coefficients from the Tamahane, Games-Howell, Dunnet T3, and Dunnet C tests. Additionally, results from the Games-Howell test indicates significant differences in use of retained profits between firms less than 5 years and firms in age category 10–14 years and age category 15–19 years. These findings confirm evidence for the financial growth life cycle model discovered in the previous test and further emphasise the importance of profitability in financing the sector, although statistically significant inter-group differences are not observed between all age groups.

Use of government grants and equity differs significantly between firms aged 5–9 years and firms aged 15–19 years, as evidenced by results from the Tamahane, Dunnet T3, Games-Howell, and Dunnet C tests. Results from the latter two tests also indicate statistically significant differences between firms aged 5–9 years and firms in the oldest age category. Furthermore, statistically significant differences in use of venture capital between firms aged 5–9 years and firms in the oldest age category are evidenced by results from the Games-Howell and Dunnet C tests. These results provide evidence of the negative relationship between use of external equity and age of the firm, specifically between firms in the second youngest and oldest age categories.

Use of short-term bank loans and overdrafts differ significantly between firms aged 15–19 years and firms over 30 years, as evidenced by results from all four post-hoc tests. This result indicates that firms in the older age category make greater use of short-term debt than firms in the younger age category, which is contrary to the prediction of the financial growth life cycle model, (that use of short-term debt is negatively related with age). This finding may be explained by the temporary nature of short-term debt financing, i.e. it is used when retained profits are insufficient, regardless of a firm's age, which is consistent with the contention of Esperanca et al. (2003).

In summary, post-hoc Anova tests facilitate further investigation of the financial growth life cycle model by identifying statistically significant inter-age group differences in sources of finance employed. The statistically significant increase in use of retained profits as age profiles increase is confirmed by post-hoc tests indicating significant differences between both youngest age groups and four older age groups. Post-hoc tests also confirm significant inter-age group differences in use of government grants and equity, venture capital, and short-term bank debt. Post-hoc tests do not indicate significant inter-age group differences in use of funds from business angels and private investors, and long-term debt, notwithstanding statistically significant results for these sources in the one-way Anova. Whilst certain propositions of the financial growth life cycle model (Berger and Udell 1998) are supported for specific age groups, lack of statistical significance precludes acceptance of the model for all respondents.

2.7 Comparison of Sources of Finance Employed at Start-Up and at Present

A further statistical test that may be employed to investigate temporal differences in capital structures utilising cross-sectional data is the paired-samples t test. This test compares means for two variables that represent the same group at different times, or related groups. Significant differences between variables are indicated by low significance values for the t test and the absence of zero in confidence intervals. The paired-samples t test is conducted to compare means of sources of financing employed by respondents at start-up with those employed at present.

Firstly, paired-samples correlations were examined. Since the two variables represent the same firm at different times, the correlation should be fairly high and the significance value low. If the significance value is high, an alternative test to the paired-samples t test is more appropriate, such as the independent-samples t test. Data presented in Table 2.3 reveals high correlations among variables and significance values less than 0.05 in all cases, thus the paired-samples t test is employed.

Results presented in Table 2.4 reveal significant differences in sources of finance employed at start-up with those employed at present for all but two sources, namely long-term debt, and business angels and private investors. Consistent with the financial growth life cycle model, these results indicate that percentage of finance employed from all sources apart from the latter two changes significantly between start-up and the present day. Reiterating patterns observed in the previous section, personal sources of finance and government equity schemes are more important at the nascent and start-up stages of the firm, whilst retained profits, debt, and leasing become increasingly more important as firms get older. The largest difference observed is greater than minus 30% in use of retained profits. This pronounced difference is consistent with propositions of the financial growth life cycle model and the pecking order theory, and further emphasises the importance of profitability in financing the sector.

Table 2.3 Paired-samples correlations between sources of financing employed by respondents at start-up with those employed at present.

Source of financing	Correlation	Significance
Personal savings of founder(s), funds from friends and family	0.232	0.000***
Business angels and private investors	0.681	0.000***
Retained profits	0.130	0.024**
Government grants and equity	0.299	0.000***
Venture capital	0.628	0.000***
Short-term bank loans and overdrafts	0.242	0.000***
Off Balance sheet financing (leases, HP financing)	0.530	0.000***
Long-term debt	0.334	0.000***

***, ** Statistically significant at the 99% and 95% levels of confidence respectively

Table 2.4 Paired-samples t test comparing sources of financing employed by respondents at start-up with those employed at present

Source of financing	Mean (%)	Standard deviation	Significance (2 tailed)
Personal savings of founder(s), funds from friends and family	26.1	0.417	0.000***
Business angels and private investors	−0.1	0.141	0.870
Retained profits	−32.4	0.397	0.000***
Government grants and equity	1.2	0.094	0.027**
Venture capital	−1.8	0.149	0.040**
Short-term bank loans and overdrafts	−8.3	0.329	0.000***
Off Balance sheet financing (leases, HP financing)	−1.8	0.111	0.004***
Long-term debt	−1.9	0.223	0.143

***, ** Statistically significant at the 99% and 95% levels of confidence respectively

The second largest difference between sources of finance employed at start-up and at present is in use of personal savings of the firm owner and "f" connections, at 26%. This figure is consistent with previous empirical evidence (Ullah and Taylor 2007), and emphasises the importance of personal sources of finance at start-up. This result is also consistent with the life cycle model of financing, and confirms the findings of the one-way Anova analysis.

Paired sample means for short-term and long-term debt are negative, implying that respondent firms have greater access to, and make greater use of debt finance at present than at start-up. These negative values are inconsistent with predictions of the financial growth life cycle model, that use of debt decreases over time as it is repaid and the firm becomes increasingly reliant on retained profits. The value for long-term debt, although negative, is statistically insignificant. The value for short-term debt (−8.3%) is the third largest difference observed, suggesting that access to, and use of short-term debt increases as firms grow older and information asymmetries dissipate. This result is consistent with reputation theory (Diamond 1989), and emphasises the importance of short-term debt in the capital structures of respondents.

Results concerning use of sources of external equity are mixed. The co-efficient for use of government equity is positive and significant, supporting the proposition that use of external equity is negatively related with age. By contrast, coefficients for finance sourced from business angels and private investors, and venture capitalists are negative and apparently contradictory of results in the previous section. In the case of business angels and private investors, the coefficient is extremely small (−0.134%) and statistically insignificant. The value observed in use of venture capital finance is relatively small (−1.78%), and may be explained by the fact that over 70% of firms reporting use of this source are between 5 and 15 years old, resulting in the small negative value. This result is consistent with investment practices of venture capitalists.

There are a number of caveats with employing the paired samples t-test to investigate the financial growth life cycle, although it does not appear that they have been manifested in this study. Firstly, examining the financing of young firms at present is not analogous with examining the financing of today's older firms when they were young. A firm aged more than 30 years at present probably had access to different sources of funds at start-up than young firms today, due primarily to developments in venture capital and private equity markets. Secondly, because of advances in technology and production processes, capital requirements for firms at start-up today may be very dissimilar from those of start-up firms 20 or 30 years ago. Additionally, data reported for start-up may be prone to recall bias. This is tempered, however, by the fact that setting up a firm is a major event, and the firm owner is unlikely to forget sources of finance employed for such a momentous undertaking.

Despite these caveats, the paired samples t-test provides an important overview of changes in respondents' capital structures between start-up and present. Analysed in conjunction with results of the one-way Anova presented in Table 2.2, results suggest that firms source finance in a manner consistent with the financial growth life cycle model. Consistent with propositions of Berger and Udell (1998), importance of particular sources of finance vary depending on the location of

respondents on the firm continuum. Furthermore, results suggest support for a number of propositions of the pecking order theory (Myers 1984; Myers and Majluf 1984), in particular emphasising the importance of profitability in financing the sector.

2.8 Data on the Provision of Collateral by Respondents

The primary source of external financing for SMEs generally, and for this study in particular, is debt. Financial institutions commonly employ asset-based lending techniques when advancing debt, and numerous studies have documented the importance of collateral in securing debt (Berger and Udell 1995; Coco 2000; Bartholdy and Mateus 2008; Heyman et al. 2008). Collateral is typically required to secure commercial and industrial loans regardless of firm age (Heyman et al. 2008), with the requirement for collateral to secure debt finance relatively more pronounced in new firm formations (Hanley and Girma 2006). Founders of new and nascent ventures commonly provide personal assets as collateral to secure business loans in the absence of adequate firm assets (Fluck et al. 1998), a contribution referred to as "quasi-equity". The pervasive requirement for collateral to secure debt finance indicates its fundamental importance in financing SMEs, as firms with tangible assets are less likely to be financially constrained (Almeida and Campello 2007). (For a more comprehensive discussion on collateral and the importance of collateral in SME financing, see the "agency theory" section in Appendix B). Some authors propose that provision of collateral is the most important determinant of capital structure (Bartholdy and Mateus 2008), and therefore it seems pertinent to consider sources of collateral employed by respondents to secure firm debt. Data relating to collateral provision is presented in the following sections, employing similar statistical techniques as those used in the preceding consideration of sources of financing.

2.9 Comparison of Collateral Provision Across Age Groups

Data on sources of collateral provided to secure debt was requested from respondents in percentage form, and is presented as a one-way Anova in Table 2.5. Differences in means of collateral provision across age profiles of respondent firms are indicated by significant Anova F statistics. Use of collateral external to the firm to secure debt finance is most important for firms in the youngest age categories, as firms seek to overcome potential problems of moral hazard due to lack of a trading history. In firms less than 5 years old, 61% of respondents providing collateral to secure debt finance employ sources external to the fixed assets of the firm. This finding explains the relatively high use of debt finance (29% of total funding) by respondents in the youngest age categories reported in Table 2.2, and is consistent with patterns observed by Berger and Udell (1998) and Fluck et al. (1998).

Table 2.5 One-way Anova of the sources of collateral provided by respondents across age categories

Firm age (n = 297)	"External" sources of collateral (% of debt secured employing)				"Internal" collateral (%)
	Personal assets of the firm owner	Other guarantors	Other security at present	Total "external" collateral	Liens on the fixed assets of the firm
<5 years	32	24	6	61	39
	(0.38)	(0.35)	(0.14)	(0.44)	(0.37)
5–9 years	28	9	9	45	55
	(0.32)	(0.17)	(0.20)	(0.39)	(0.41)
10–14 years	27	3	9	39	61
	(0.33)	(0.09)	(0.23)	(0.39)	(0.45)
15–19 years	15	2	8	25	75
	(0.25)	(0.05)	(0.20)	(0.32)	(0.48)
20–29 years	16	1	7	25	75
	(0.24)	(0.06)	(0.21)	(0.31)	(0.45)
>30 years	8	3	9	20	80
	(0.19)	(0.10)	(0.21)	(0.29)	(0.47)
Total	17	5	9	30	70
	(0.26)	(0.13)	(0.20)	(0.34)	(0.45)
One-way Anova F statistic	0.128	0.001***	0.997	0.047**	0.032**

***, ** Statistically significant at the 99% and 95% level of confidence respectively. Standard deviations in parentheses

A notable sectoral difference is that "other guarantors" are used primarily by firms less than 10 years old in the "computer software development and services" sector. This result reiterates the importance of business angels and private investors to firms in the youngest age categories reported in Table 2.2, especially in sectors typified by a lack of tangible assets. The Anova F values reported in Table 2.5 indicate statistically significant differences in provision of collateral by "other guarantors" to secure firm debt across age groups. Differences in provision of owners' personal assets as collateral across age groups is not statistically significant at the 95% level of confidence, however.

Respondents report that fixed assets of the firm as a source of collateral become relatively more important as the firm ages. This result is consistent with the proposition of Berger and Udell (1998), that firms typically accumulate collateralisable assets in the form of premises, plant and equipment as they survive, grow, and mature. Additionally, this finding may be partly explained by the predominance of respondents in sectors typified by high levels of collateralisable assets, namely, "distribution, retail, hotels, and catering" and both manufacturing sectors, in the older age categories. This result suggests that financial institutions commonly require collateral for short-term bank loans and overdrafts, even in older, mature firms. Additionally, general use of collateral in the oldest age categories may be overstated, as it is accounted for by 2.5% of firms securing over 50% of debt using liens on the fixed assets of the firm.

Provision of collateral by respondents is consistent with theories based on information asymmetries. Differences in sources of collateral provided to secure firm debt across age groups reflect differences in respondents' access to collateral and sectoral differences in age profiles. Start-up and early stage firms are more reliant on external sources of collateral, such as personal assets of the firm owner and assets of other guarantors, at a stage when problems related to information opacity are greatest. Information asymmetries dissipate somewhat as firms grow and mature because of reputation effects (Diamond 1989), although observed collateral provision suggests that financial institutions continue to demand collateral even in older firms, providing empirical evidence of the reliance of financial institutions on asset-based lending techniques. Observed increased reliance on fixed assets of the firm as a source of collateral as age profiles of respondents increase may also be explained by the presence of older firms in sectors typified by a high level of fixed assets. Sectoral differences in collateral provision are investigated further in Chap. 3.

2.10 Comparison of Collateral Provision at Start-Up and at Present

Similar to the statistical analysis of sources of finance employed by respondents, the life cycle aspect of collateral provision is considered by comparing sources of collateral employed at start-up with those employed at present. Respondents were requested to provide details of sources of collateral provided to secure debt financing at start-up and at present. This data was examined by conducting a paired-samples t test. Firstly, an analysis of paired-samples correlations was conducted to ensure that correlation coefficients were satisfactorily high and significance values for each pair of variables were all very low (typically less than 0.05). This was the case for each pair of variables, as reported in Table 2.6.

Results of the paired-samples t test reported in Table 2.7 reveal a statistically significant difference in provision of collateral between start-up and at present in two cases; in personal assets of the SME owner provided as security, and in use of the fixed assets of the firm. As personal funds of the SME owner are an important source of finance for firms at start-up, so also are personal assets of the SME owner an important source of collateral on which to secure debt finance. The statistically significant positive coefficient of 11.8% indicates that personal assets of the firm owner are a more important source of collateral at the start-up stage for the total

Table 2.6 Paired-samples correlations between source of collateral employed at start-up and at present

Source of collateral	Correlation	Significance
Personal assets of the firm owner	0.395	0.000***
Other guarantors	0.527	0.000***
Other security	0.357	0.000***
Liens on the fixed assets of the firm	0.390	0.000***

***Statistically significant at the 99% level of confidence

Table 2.7 Paired-samples t test comparing source of collateral employed by respondents at start-up and at present

Source of collateral (n = 299)	Mean (%)	Standard deviation	Significance (2 tailed)
Personal assets of the firm owner	11.8	0.369	0.000***
Other guarantors	1.2	0.147	0.157
Other security	−2.2	0.205	0.068
Liens on the fixed assets of the company	−25.4	0.446	0.000***

***, ** Statistically significant at the 99% and 95% level of confidence respectively

sample. Employing personal assets to secure debt finance for the firm at start-up alleviates information asymmetries at the stage of greatest information opacity. This finding suggests that initial capitalisation of the firm is a function of the personal wealth of the SME owner at start-up (Evans and Jovanovic 1989; Avery et al. 1998), combined with his risk-taking propensity (Ang et al. 1995; Romano et al. 2001). Fixed assets of the firm are a more important source of collateral for respondents at present than they were at start-up, as indicated by the statistically significant negative coefficient of 25.4%. This result may be partly explained by the accumulation of collateralisable assets as firms grow and mature (Berger and Udell 1998). Another potential explanation for this result is the older age profile of firms in sectors with a higher percentage of fixed assets (all sectors except the "computer software development and services" and "other services" sectors).

Results from the paired-samples t test suggest a life cycle pattern in provision of collateral, as personal assets of the firm owner and other guarantors are more important at start-up than in later stages of development. Fixed assets of the firm are more important as a source of collateral in later years than at start-up, although this result may be partly attributed to the sectoral profile of the sample.

As with respondents' replies on sources of finance employed, data on provision of collateral must be approached with a degree of caution due to recall bias. This is tempered by the fact that, for a major event like starting a business, the firm owner is likely to remember the source of collateral employed to secure debt finance, particularly if personal assets were used as collateral. It is also important to note that significant sectoral differences in asset structure may influence the provision of collateral, but are not taken into account in the paired-samples t test. Sectoral differences are explored later in Chap. 3. Finally, personal guarantees of the firm owner and other guarantors are not considered in this study, but may be important in securing business debt (Avery et al. 1998).

2.11 Conclusions

Observed capital structures suggest that respondents source finance in a manner consistent with propositions of the pecking order theory (Myers 1984; Myers and Majluf 1984), broadly following a financial growth life cycle model. Internal equity

becomes the most important source of financing over time, as firms increasingly employ retained profits. This source is augmented by short-term debt, which, consistent with Diamond's (1989) reputation theory, is employed progressively more as age profiles increase. Increasing use of these two sources reduces reliance on personal sources of funding of the firm owner over time, although the owner may continue to provide personal assets and guarantees to secure debt financing for the firm. A small number of respondents source equity from venture capitalists, business angels, private investors, and government grants. Results suggest that these sources of external equity are generally employed by firms in specific sectors with a defined profile, and are most important for firms in the youngest age groups. Respondents' capital structures are consistent with results from previous empirical studies, i.e. firms acquire increased access to financing options, especially debt financing, as information asymmetries dissipate over time. Although the proportion of financing employed from internal and external sources is approximately equal for the total sample, there are distinctive changes in sources of finance employed across age groups.

Respondents in the youngest age category source 70% of financing requirements from external sources. Relatively high use of short-term and long-term debt by respondents in the youngest age categories is explained by the provision of personal assets as collateral. Consistent with evidence from previous studies (Berger and Udell 1998; Fluck et al. 1998), 63% of respondents reporting use of personal assets to secure business debt are less than 15 years old. In the absence of firm assets and personal assets to secure debt for youngest firms, respondents employ assets of "other guarantors". "Other guarantors" are particularly important for firms less than 10 years old in the "computer software development and services" sector.

Results of statistical tests employed, namely one-way Anova and post-hoc analyses, and paired-samples t tests indicate statistically significant support for a central proposition of the life cycle model, i.e. use of retained profits increases with age. Analysis of observed collateral provision by respondents evidences use of asset-based lending techniques by financial institutions, and suggests that sources of collateral employed follows a trajectory over the life cycle of the firm similar to the financial growth life cycle model. An advantage of the statistical methodology employed in this chapter is that it facilitates an examination of changes in sources of financing employed over time, particularly changes in proportions of finance secured "inside" and "outside" the firm as it matures. Notwithstanding these advantages, this analysis considers but one independent variable. A more comprehensive investigation of financing choices, particularly inter- and intra-industry differences is now conducted by employing more sophisticated statistical techniques, and testing a wider range of independent variables. In the following chapter, determinants of firm financing are further examined by testing multivariate statistical models on reported financing data.

Chapter 3
SME Financing: Investigation of Firm and Industry Effects

From consideration of the previous studies of the determinants of the capital structure of small enterprises it becomes clear that profitability, growth, asset structure, size, age, and possibly industry are, prima facie, likely to be related to capital structure

(Hall et al. 2000, p. 300)

3.1 Introduction

Empirical evidence from previous studies (Sogorb Mira 2005) and reports (Brierley and Kearns 2001; Cole 2008) suggests that firm characteristics such as size, age, growth, and profitability have a significant influence on a firm's capital structure. Additionally, a number of studies suggest that asset structure is a primary determinant of firm financing (Bartholdy and Mateus 2008), implying inter-industry differences in capital structures, as firms in industries typified by greater levels of collateralisable assets have the capacity for, and may employ, greater levels of debt than firms with a higher concentration of intangible assets (Brierley and Kearns 2001). Indeed, intra-industry capital structures may be more comparable than inter-industry capital structures (Harris and Raviv 1991). In this chapter, the potential determining effect of firm characteristics on the source of finance employed is investigated by testing a number of multivariate regression models on financing data of firms in the sample. Whilst the multivariate regression approach employed in this study is not original, there are a number of novel features in the statistical methodology adopted and variables tested. Application of regression analysis on survey data is uncommon in finance (De Jong and Van Dijk 2007), particularly in SME finance, as previous empirical theory testing studies conducted multivariate regression models on panel data (Heyman et al. 2008; López-Gracia and Sogorb-Mira 2008). Additionally, this study employs data on sources of internal and external equity, in addition to debt, as dependent variables in regression models. This approach is an advancement on previously published studies, which typically tested regression models employing short- and long-term debt as

C. Mac an Bhaird, *Resourcing Small and Medium Sized Enterprises*,
Contributions to Management Science,
DOI 10.1007/978-3-7908-2399-8_3,

dependent variables (Heyman et al. 2008), with very few published studies employing a measure of equity as a dependent variable (Ou and Haynes 2006), and none employing both measures. (The dearth of studies employing internal equity as a dependent variable is surprising, considering the well-documented reliance of SMEs on retained earnings (Vos et al. 2007; Cole 2008)). Furthermore, this study employs detailed data on provision of collateral by respondents as an independent variable. This approach is considered novel, as models developed in previous studies typically test firm characteristics such as age, profitability, and size, but do not include means of collateral provision.

This chapter proceeds as follows; firstly, the multivariate statistical model to be tested is described, and summary descriptive statistics of dependent and independent variables are presented. Secondly, correlation between independent variables is examined and the presence of multicollinearity is investigated. Estimated coefficients of multivariate Ordinary Least Squares (OLS) models are then presented and analysed. Results are discussed with reference to empirical evidence from previous studies. Finally, industry specific effects are investigated employing a generalisation of Zellner's (1962) Seemingly Unrelated Regression (SUR) approach, facilitating an examination of sectoral differences in the direction and magnitude of regression coefficients.

3.2 Description of Variables Employed in Multivariate Models

The multivariate model tested in this chapter addresses the research question "Are sources of finance employed by SMEs determined by firm characteristics?" Testing multivariate models indicates not only whether certain firm characteristics determine the source of financing, but also the direction and magnitude of that effect. Dependent and independent variables selected for the model focus specifically on financial and firm characteristics required to investigate the research question, and a number are similar to variables tested in previous studies. Dependent variables selected for six multivariate static linear models comprise sources of finance employed by respondents, namely: personal funds of the firm owner and funds from "f" connections, retained profits, external equity, short-term, long-term, and total debt. These sources of finance are regressed on a number of independent variables which are described in the following section. Six regression models are estimated on data for all respondents, initially disregarding differences in asset structure and other sectoral factors. An empirical investigation of sectoral differences in the direction and magnitude of these relationships is conducted later in the chapter.

3.3 Summary Descriptive Data of Dependent Variables

Multivariate models are employed to test firm characteristic determinants of two sources of debt, and three sources of equity. Total debt is also examined as a dependent variable, notwithstanding potential difficulty in interpreting

determinants of total debt due to confounding opposite effects for short-term and long-term debt (Hall et al. 2000). Dependent variables employed are expressed as a percentage of total financing, and are described in Table 3.1. Descriptive statistics of dependent variables presented in Table 3.2 indicate that retained profits and short-term debt are the most important sources of finance, although there are significant differences in use of these sources across age groups, as evidenced by results of the one-way Anova presented in the previous chapter.

Personal sources of finance, external equity, and long term debt constitute 11%, 13%, and 9% of respondents' capital structures respectively, and these distributions are positively skewed. Although dependent variables are not normally distributed, the central limit theorem states that the sampling distribution of the mean approaches a normal distribution as sample size increases. Violations of normality have critical implications for relatively small samples, but ". . .effectively diminish when sample sizes reach 200 cases or more" (Hair et al. 2006, p. 86). The sample size in this study is 299, and therefore it is deemed sufficiently large to overlook this violation.

Table 3.1 Description of dependent variables

Dependent variable (Acronym)	Description of variable
Personal savings and funds from "f" connections (PERF)	Personal savings of firm owner, funds from friends and family (as a percentage of total financing)
Retained profits (RET)	Retained profits (as a percentage of total financing)
External equity (EXTEQ)	Venture capital + Business angels and Private investors + Government grants and equity (as a percentage of total financing)
Long-term debt (LTD)	Long-term debt (as a percentage of total financing)
Short-term debt (STD)	Short-term bank loans and overdraft (as a percentage of total financing)
Total debt (TD)	Short-term debt (STD) + Long-term debt (STD) (as a percentage of total financing)

Table 3.2 Descriptive statistics of dependent variables

Dependent variable	Mean	Standard deviation	First quartile	Median	Third quartile
Personal savings and funds from "f" connections	0.11	0.22	0.00	0.00	0.05
Retained profits	0.43[a]	0.39	0.00	0.20	0.75
External equity	0.13	0.26	0.00	0.00	0.04
Long-term debt	0.09	0.19	0.00	0.00	0.00
Short-term debt	0.24[a]	0.30	0.00	0.00	0.30
Total debt	0.33[a]	0.34	0.00	0.05	0.50

[a]Denotes small differences with values reported in Table 2.2 due to aggregation to 100%

Table 3.3 Distribution statistics of dependent variables and test for normal distribution

Dependent variable	Skewness	Kurtosis	Kolmogorov-Smirnov Z	
			Statistic	Significance
Personal savings and funds from "f" connections	2.79	7.38	6.47	0.00[a]
Retained profits	0.59	−1.29	4.84	0.00[a]
External equity	2.52	4.56	6.78	0.00[a]
Long-term debt	3.05	9.24	8.01	0.00[a]
Short-term debt	1.51	1.08	5.65	0.00[a]
Total debt	0.96	−0.46	4.69	0.00[a]

[a]Denotes the data differs from a normal distribution. This result is statistically significant at the 99% level of confidence

Table 3.4 Description of independent variables

Independent variable (Acronym)	Description of variable
Firm age (Age)	Age of the firm in years at the time of the survey (categorical variable)
Firm size (Size)	Gross sales turnover of the firm (categorical variable)
Research and development expenditure (R&D)	Percentage of turnover spent on research and development (categorical variable)
Ownership structure (Own)	Closely held ownership of the firm (dichotomous dummy variable, no=0, yes=1)
Internal collateral (Intcoll)	Percentage of debt secured by liens on the fixed assets of the firm
Owners' collateral (Owncoll)	Percentage of debt secured by personal assets of the firm owner

3.4 Summary Descriptive Data of Independent Variables

Independent or firm characteristic variables are selected by considering the theoretical literature and accumulated empirical evidence, and are described in Table 3.4. A number of independent variables are directly observable, such as firm age and size, and means of collateral employed to secure business debt. Age and size variables are recorded in categorical form, and both series range from 1, representing the youngest and smallest age groups, to 6 representing the oldest and largest age groups. Data on source of collateral is recorded as percentage of debt secured by a particular source of collateral. R&D expenditure is expressed as a percentage of turnover, and is recorded in categorical form; ranging from 1 representing the lowest expenditure as a percentage of turnover spent on R&D, to 5 representing the highest. The ownership variable employed is defined as a dichotomous dummy variable, with 1 representing closely held ownership structure.

Firms on the database employed were classified by two digit NACE codes, as detailed in Appendix C. Taking account of intra-industry similarities, the database was divided into six categories, as summarised in Table 3.5. Categorisation of firms

in this manner facilitates an examination of potential sectoral differences in sources of financing employed.

Descriptive and distribution statistics of independent variables are presented in Tables 3.6 and 3.7 respectively. Figures indicate that firms are predominantly from the oldest age and largest size categories, and these distributions are negatively skewed. Respondents' expenditure on R&D is generally low, and this distribution is positively skewed. Most firms have a closely held ownership structure, and this distribution is negatively skewed. By contrast, data on source of collateral provision is positively skewed, and debt is more commonly secured on fixed assets of the firm. One-sample Kolmogorov-Smirnov Z statistics reveal that the distribution of independent variables does not correspond to the normal distribution. Nonetheless, the sample size is deemed sufficiently large to discount these violations and conduct regression analysis.

Table 3.5 Description of sectoral acronyms

Acronym	Sector
Metal	Metal manufacturing and engineering industry
Manu	"Other" manufacturing industry
Hotel	Distribution, retail, hotels, and catering
Computer	Computer software development and services
Servs	Other services
Other	Other industries

Table 3.6 Descriptive statistics of independent variables

Independent variable	Mean	Standard deviation	First quartile	Median	Third quartile
Firm age	4.25	1.66	3	5	6
Firm size	4.03	1.24	3	4	5
Expenditure on R&D	1.87	0.82	1	2	2
Ownership structure	0.63	0.48	0	1	1
Owners' collateral	0.10	0.26	0	0	0
Internal collateral	0.41	0.46	0	0	1

Table 3.7 Distribution statistics of independent variables and test for normal distribution

Dependent variable	Skewness	Kurtosis	Kolmogorov-Smirnov Z	
			Statistic	Significance
Firm age	−0.47	−1.20	3.78	0.00[a]
Firm size	−0.55	−0.30	3.60	0.00[a]
Expenditure on R&D	1.14	1.91	4.90	0.00[a]
Ownership structure	−0.54	−1.73	7.04	0.00[a]
Owners' collateral	2.74	6.17	7.96	0.00[a]
Internal collateral	0.35	−1.76	5.53	0.00[a]

[a]Denotes the data differs from a normal distribution. This result is statistically significant at the 99% level of confidence

A summary of dependent and independent variables employed in previous studies is presented in Table 3.8. Examination of the table reveals commonly tested dependent variables (short-term and long-term debt ratios), as well as frequently tested independent variables. One way in which this study adds to the literature is in selection of variables tested in multivariate models. The inclusion of independent variables comprising internal and external collateral is uncommon. Furthermore, dependent variables examined include lesser tested internal equity variables, namely "retained profits" and "funding from personal sources and 'f' connections". The static linear multivariate model tested for six dependent variables is represented as:

$$Y = \beta_0 + \beta_1 AGE + \beta_2 SIZE + \beta_3 R\&D + \beta_4 OWN + \beta_7 OWNCOLL + \beta_8 INTCOLL + \varepsilon.$$

3.5 Tests for Multicollinearity

If independent variables are highly correlated it is difficult to determine the separate effect of each independent variable, thus posing problems in interpreting regression coefficients. This is not a problem of "model specification", but of data (Hair et al. 2006, p. 226). One method for identifying correlation is to examine correlation coefficients of independent variables, which indicate the magnitude and direction of association between two variables. Coefficients are calculated employing the Pearson product moment. The Pearson correlation coefficient is a measure of linear association between two variables, indicating the direction and strength of the relationship, and has values ranging from -1 to $+1$. A number of independent variables are correlated at the 99% level of significance, as indicated by the Pearson product moment correlation coefficients in Table 3.9. In these instances, the null hypothesis of no association between variables is rejected. The moderate magnitude of correlations does not suggest a high degree of first-order collinearity among independent variables. The most significant correlation is between AGE and R&D variables, with a value of -0.381.

Although magnitude of correlation coefficients is moderate, lack of high correlation values does not ensure a lack of collinearity, as the combined effect of two or more independent variables may cause multicollinearity. Multicollinearity refers to the case where high intercorrelations between two or more variables reduces ability to establish separate effects of each independent variable because of pooled variance (Hair et al. 2006). The effect of multicollinearity is that regression coefficients are inefficient or unstable, but are unbiased. This inefficiency reduces with sample size. Multicollinearity was investigated by computing tolerance values and Variance Inflation Factors (VIF). Tolerance value is the amount of an independent variable's predictive ability that is not predicted by other independent variables in

Table 3.8 Dependent and independent variables employed in statistical models tested in previous studies

Author	Model	Dependent variables					Independent variables									
		Internal equity	External equity	Long-term debt	Short-term debt	Total debt	Size	Age	Asset structure	Π/ ROI	Risk	Growth (options)	Industry dummy	Owner char.	Owner structure	Other
Van der Wijst and Thurik (1993)	LSDV			X	X	X			X	X						Deprn. Inv. Turn
Balakrishnan and Fox (1993)	Random effects model					X					X	X				Deprn. R&D
Chittenden et al. (1996)	OLS			X	X		X	X	X	X		X				
Fluck et al. (1998)	Tobit	X	X	X	X			X	X			X	X	X		
Jordan et al. (1998)	OLS, WLS					X	X		X	X	X	X				Strategy variables
Michaelas et al. (1999)	OLS			X	X	X	X	X	X	X	X	X	X			Tax rate NDTS Net drs.
Romano et al. (2001)	SEM	X	X	X	X		X	X	X			X		X	X	
Hall et al. (2000)				X	X		X	X	X	X		X				
Fu et al. (2002)	OLS	X (Π)											X			Cap. and econ. growth
Zoppa and McMahon (2002)	Logit			X	X	X	X	X	X	X		X		X	X	
Watson and Wilson (2002)	OLS	X	X	X	X					X					X	
Esperanca et al. (2003)	OLS			X	X	X	X	X	X	X	X	X				Economic risk
Cassar and Holmes (2003)	OLS			X	X		X		X	X	X	X				

(*continued*)

Table 3.8 (continued)

Author	Model	Dependent variables					Independent variables									
		Internal equity	External equity	Long-term debt	Short-term debt	Total debt	Size	Age	Asset structure	Π/ ROI	Risk	Growth (options)	Industry dummy	Owner char.	Owner structure	Other
Cassar (2004)	Logit, Tobit, OLS			X	X				X			X		X		Legal org.
Voulgaris et al. (2004)	NLLS			X	X	X	X		X	X		X				
Hall et al. (2004)	OLS			X	X		X	X	X	X		X				
Johnsen and McMahon (2005)	OLS			X	X	X	X	X	X			X	X			ROA
Gregory et al. (2005)	Multinomial logistic regression	X	X	X			X	X					X			
Sogorb-Mira (2005)	OLS			X	X	X	X		X	X		X				Tax rate NDTS
Ou and Haynes (2006)	Logistic regression	X	X				X	X		X		X	X	X	X	legal org.
López-Gracia and Sogorb-Mira (2008)	GMM and two stage least squares					X	X	X		X	X	X				Tax rate NDTS
Heyman et al. (2008)	OLS					X	X		X	X		X				

ROI = Return on investment; Π = profitability; Owner char. = Owner characteristics; Owner. Structure = Ownership structure; Deprn. = Depreciation; Inv. Turn. = Inventory turnover; R&D = R&D expenditure as a percentage of net sales; NDTS = Non-debt tax shields; Net drs. = Net debtors; Cap. and econ. growth = Capital growth rate and economic growth rate (%); Legal org. = Legal organisation; ROA = Return on assets; LSDV = Least squares dummy variable; OLS = Ordinary least squares regression; WLS = Weighted least squares regression; SEM = Structural equations modelling; NLLS = Non-linear least squares using Marquardt's algorithm; GMM = Generalised moments method

Table 3.9 Pearson correlation coefficients

	Age	Size	R&d	Own	Intcoll
Age					
Size	0.269*				
R&D	−0.381*	−0.377*			
Own	0.378*	0.078	−0.256*		
Intcoll	0.194*	0.232*	−0.211*	0.069	
Owncoll	−0.157*	−0.159	0.059	0.032	−0.219*

*Correlation is statistically significant at the 99% level of confidence (2-tailed)

the equation, and VIF is the inverse of tolerance value (Hair et al. 2006). A high tolerance value means a small degree of multicollinearity, and a tolerance value of 1.00 indicates that it is totally unaffected by other independent variables. As presented in Table 3.10, tolerance values range from 0.919 (OWNCOLL) to 0.724 (AGE). These values do not indicate levels of multicollinearity that should distort regression variates; in the worst case 27.6% of a variable's variance (AGE) is explained by other independent variables.

A further check for multicollinearity is to examine eigenvalues and condition indices. A condition index greater than 15 indicates a possible problem, and an index value greater than 30 suggests ". . .a serious problem with multicollinearity" (Karine et al. 2004, p. 197). None of the condition indices is found to be greater than 15, supporting the conclusion that multicollinearity does not pose a problem.

3.6 Multivariate Regression Results

Six OLS multivariate models are tested, one for each dependent variable, examining relationships between source of financing employed and firm characteristics. Regression coefficients indicate the direction and magnitude of relationships between dependent and independent variables, and are presented in Table 3.10. Significance of "F" value coefficients indicate that regression models are statistically significant for all six dependent variables.

The negative relationship between age and personal savings of founders and funds from friends and family shown in Table 3.10 is consistent with life cycle models of financing, which propose that funds from this source are most important at start-up and nascent stages of the firm. As the firm ages, it typically accesses a wider range of sources of financing as information asymmetries dissipate. This coefficient is not statistically significant, however.

The negative relationship between use of external equity and age shown in Table 3.10 reflects investment practices of equity providers, and is consistent with the financial growth life cycle model proposed by Berger and Udell (1998). This approach proposes that providers of external equity are typically involved in young or early-stage firms, as business angels and venture capital providers seek to

Table 3.10 Estimated ordinary least squares regression coefficients

Independent variables	Internal equity		External equity	Debt			Collinearity statistics	
	Owners' personal funds, and funds from "f" connections	Retained profits	External equity	Short-term debt	Long-term debt	Total debt	Tolerance	VIF
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6		
Age	−0.002	0.030**	−0.008	0.008	−0.015*	−0.007	0.724	1.38
	(−0.204) [0.838]	(2.01) [0.045]	(−0.806) [0.421]	(0.667) [0.505]	(−1.90) [0.059]	(−0.515) [0.607]		
Size	−0.031***	0.035*	0.010	0.009	0.016*	0.026	0.805	1.24
	(−2.92) [.004]	(1.80) [0.073]	(0.745) [0.457]	(0.583) [0.560]	(1.63) [0.104]	(1.52) [0.129]		
R&D	0.007	−0.098***	0.113***	−0.011	−0.001	−0.013	0.760	1.31
	(0.404) [0.686]	(−3.22) [0.001]	(5.83) [0.000]	(−0.458) [0.647]	(−0.086) [0.932]	(−0.482) [0.630]		
Own	0.028	0.078	−0.158***	−0.005	−0.011	−0.015	0.827	1.21
	(1.04) [0.297]	(1.60) [0.112]	(−5.05) [0.000]	(−0.115) [0.909]	(−0.427) [0.670]	(−.359) [0.720]		
Owncoll	0.260***	−0.238***	−0.044	0.129*	0.014	0.143**	0.919	1.09
	(5.59) [0.000]	(−2.86) [0.005]	(−0.823) [0.411]	(1.89) [0.060]	(0.330) [0.742]	(1.97) [0.050]		
Intcoll	−0.033	−0.135***	−0.040	0.147***	0.110***	0.257***	0.882	1.13
	(−1.18) [0.237]	(−2.71) [0.007]	(−1.27) [0.207]	(3.60) [0.000]	(4.19) [0.000]	(5.88) [0.000]		
Constant	0.186***	0.293**	0.022	0.074	0.033	0.107		
	(2.53) [0.012]	(2.23) [0.026]	(0.265) [0.791]	(0.684) [0.495]	(0.480) [0.632]	(0.930) [0.353]		
Adjusted R^2	0.162	0.149	0.259	0.045	0.065	0.12		
"F" Value	10.17	9.28	17.57	3.22	4.3	7.45		
Significance of "F"	0.000	0.000	0.000	0.005	0.000	0.000		
White test. Chi-squared statistic (Probability)	47.5*** (0.000)	52*** (0.000)	53*** (0.000)	13.1 (0.287)	14.1 (0.227)	15.9 (0.143)		

***, **, * statistically significant at the 99%, 95% and 90% level of confidence respectively. t statistics in parentheses. Significance levels in square brackets

maximise their investment by "getting in" early (Smith and Smith 2004). Additionally, SMEs typically seek external equity when sources of internal equity and debt are insufficient to fund positive NPV projects (pecking order theory), an occurrence more frequent in firms with a relatively younger profile.

Use of retained profits is positively related with age of respondent firms. This statistically significant relationship is consistent with the well documented pattern of profit accumulation by surviving firms, which are used to fund positive NPV projects. Nascent and early-stage firms typically do not generate sufficient profits for investment in the earliest years of operation, and are more concerned with liquidity and breaking even. As firms survive the (often turbulent) early years to prosper and grow, profits are commonly accumulated and used to fund investment opportunities. This positive relationship is consistent with the financial growth life cycle model and the pecking order theory.

A number of researchers indicate that the relationship between age and financing, particularly debt financing, is not linear (Fluck et al. 1998). This view contends that use of external financing is low initially, rising after a number of years, and eventually decreasing again as firms become more reliant on internal sources of funding. The relationship between age and funding was tested by computing a quadratic variable, age squared, and including it as an independent variable. Results indicate that this variable was insignificant for all models tested, leading to the conclusion that the relationship between age and funding is not quadratic.

The statistically significant negative relationship between size and personal sources of financing and funds from "f" connections highlights the importance of this source for firms with low turnover. This result supports the view that firm owners' personal sources of funding are typically inadequate to fund investment projects of large firms. Size is also a function of age, in that younger firms are generally smaller than older firms, *ceteris paribus*. A combination of these two factors implies restricted financing options for smaller firms, thus they are more dependent on personal funds of the owner, and funds from "f" connections. This result also highlights the importance of the personal wealth of SME owners to the entrepreneurial process (Evans and Jovanovic 1989; Rosen 1998; Fairlie 1999).

The statistically significant positive relationship between use of retained profits and size of the firm shown in Table 3.10, suggests a preference for internal equity among respondents. This result indicates that firms are financed in a manner consistent with the pecking order theory (Myers 1984; Myers and Majluf 1984), and supports the financial growth life cycle model. This result is consistent with previous empirical evidence (Fu et al. 2002), and emphasises the importance of profitability in financing SMEs highlighted by Ou and Haynes (2006).

The positive relationship between closely held ownership and use of both retained profits, and personal funds and funds from "f" connections, is consistent with empirical evidence on the reliance of closely held firms on internal sources of funding (Mishra and McConaughy 1999; Romano et al. 2001; Poutziouris 2001; Lopez-Gracia and Sanchez-Andujar 2007). The primary motivation for reliance on internal equity is to retain control and ownership of the firm and maintain

independence, even if this results in passing up growth opportunities (Maherault 2000; Poutziouris 2001). (As expected there is a statistically significant negative relationship between use of external equity and closely held ownership. This result is consistent with the well documented reluctance of closely held firms to employ external equity (Poutziouris 2001; Romano et al. 2001; Lopez-Gracia and Sanchez-Andujar 2007; Blanco-Mazagatos et al. 2007)).

The statistically significant positive relationship between use of long-term debt and provision of fixed assets of the firm as collateral provides evidence of the use of asset-based lending techniques by financial institutions, and challenges the assertion that "... asset-based lending has a significant presence in only four nations, Australia, Canada, the UK, and the US" (Berger and Udell 2006, p. 2947). This result supports the view that provision of long-term debt is typically secured on fixed assets (Coco 2000), and matches the maturity of the collateralised asset (Bartholdy and Mateus 2008).

Positive relationships between use of short-term debt finance and provision of collateral are consistent with extensive empirical evidence detailing a requirement for collateral by financial institutions to overcome information and incentive problems (Black et al. 1996; Berger and Udell 2003; Heyman et al. 2008). This applies not only to long-term, but also to short-term debt (Binks et al. 1988; Cressy 1993), as evidenced by the statistically significant positive relationships between use of short-term debt and provision of collateral.

The statistically significant negative relationship between use of long-term debt and age is consistent with propositions of the pecking order theory, and confirms results of previous empirical research (Hall et al. 2000; Sogorb Mira 2005; Bartholdy and Mateus 2008). This result provides evidence of long-term debt being secured on collateralisable fixed assets, and is symptomatic of maturity matching, a practice by which firms aim to match the maturity of their assets with the maturity of their liabilities (Heyman et al. 2008; Bartholdy and Mateus 2008). As the firm ages, long-term capital and interest are repaid from retained profits, and long-term debt is gradually retired.

The positive relationship between use of short-term debt and age observed in Table 3.10 is contrary to findings in previous studies (Petersen and Rajan 1994; Michaelas et al. 1999; Hall et al. 2000), and to theoretical propositions that a firm's reliance on debt financing decreases over time. There may be a number of explanations for this result. Firstly, short-term debt is employed as a temporary source of financing and therefore any statistical relationships discovered with firm or owner characteristics may be indeterminate, as firms use short-term debt regardless of size, age, or ownership characteristics (Esperanca et al. 2003). Secondly, the positive relationship shown may reflect sectoral differences among age groups; younger age groups are dominated by firms sourcing equity when seeking additional external finance, whereas older firms are more reliant on debt. Thirdly, this result may reflect a reliance on short-term debt to provide protection because of late payments by debtors (Berger and Udell 1998). Thus, firms may use short-term debt facilities to augment internal sources of equity capital at all stages of development, retaining a short-term facility even in older, mature firms.

The positive relationship between use of personal funds and funds from "f" connections, and provision of personal assets to secure business loans is consistent with the literature on lack of separation between business and personal risks among small businesses (Ang et al. 1995; Avery et al. 1998). This result provides evidence for the well documented provision of personal assets of the firm owner to secure business loans (Cressy 1993; Black et al. 1996; Avery et al. 1998; Voordeckers and Steijvers 2006), and explains the provision of debt finance to start-up and nascent firms (Fluck et al. 1998; Berger and Udell 1998). (Emphasising the significant risk undertaken by SME owners, this result is inconsistent with the findings of Paul et al. (2007), and is explained as follows: respondents in the latter study express a desire for external equity over debt. Evidence presented in Chap. 4 suggests that respondents in the present study have a preference for debt over external equity. Additionally, external equity providers may not find such investment opportunities attractive).

The positive relationship between size and long-term debt shown in Table 3.10 supports the view that smaller firms have relatively greater agency costs, and consequently greater costs of alleviating information asymmetries due to economies of scale. This result is consistent with a number of previous studies (Michaelas et al. 1999; Cassar and Holmes 2003; Bartholdy and Mateus 2008; Daskalakis and Psillaki 2008), and emphasises the difficulty of newer, younger firms in accessing sources of external finance, particularly debt.

The positive relationship between use of short-term debt and size is contrary to empirical evidence (Esperanca et al. 2003; Hall et al. 2004), although as explained previously, relationships between short-term debt and firm characteristics may be indeterminate. Similar to the relationship between age and use of short-term debt, this result may reflect sectoral differences among age groups, with younger firms resorting to equity when sourcing external finance, whilst older firms display a relatively greater reliance on debt.

Negative relationships between use of short-term, long-term, and total debt, and closely held ownership are consistent with empirical evidence that closely held firms employ less debt (McConaugby et al. 2001; Gallo et al. 2004). The rationale for a smaller debt ratio in SMEs is an aversion to added business risk caused by debt financing (Cressy 1995), excessive levels of which may lead to not only loss of personal wealth, but also loss of family human capital (Blanco-Mazagatos et al. 2007). This proposition is supported by the negative regression coefficients in Table 3.10, although they are statistically insignificant.

The negative relationship between use of external equity and provision of collateral to secure debt financing, shown in Table 3.10, suggests that external equity is a substitute for debt finance. Consistent with empirical evidence, firms may have a preference for external equity over debt financing (Berggren et al. 2000; Brierley 2001; Hogan and Hutson 2005), which is commonly preferred by firms pursuing a high-growth strategy. Alternatively, this result may be explained by respondents' adherence to the pecking order theory (Myers 1984; Myers and Majluf 1984), as firms follow a pecking order of, first internal equity, secondly debt, and last of all external equity from new investors. Thus, the observed negative

relationship could also be explained by firms resorting to external equity as capacity for debt is exhausted (Vanacker and Manigart 2007). These issues are further explored in Chap. 4.

Negative relationships between use of debt and expenditure on R&D is consistent with empirical evidence indicating that firms with the greatest investment in innovation and high-technology have the smallest debt ratios (Carpenter and Petersen 2002a; Bougheas 2004; Ueda 2004). This result also provides additional explanation for the positive relationship between use of external equity and expenditure on R&D, as it suggests that firms employ external equity rather than debt because of a lack of access to collateralisable assets. The negative relationship between debt financing and expenditure on R&D is not statistically significant, however.

The relationship between expenditure on R&D as a percentage of turnover, and personal funds of the firm owner and funds from "f" connections, is positive as shown in Table 3.10. This result supports the view that liquidity constraints, caused by inadequate retained profits, necessitate additional resources for investment in R&D (Bougheas 2004). This finding provides evidence that SMEs committing a large percentage of turnover to expenditure on R&D may be restricted in their access to financing due to the nature of their assets and their activities (Bester 1985).

The statistically significant negative relationship between use of retained profits and R&D expenditure is consistent with empirical evidence indicating that firms with the lowest amount of internal equity are the most constrained in terms of funding for R&D expenditure (Westhead and Storey 1997). Considered in conjunction with the statistically significant positive coefficient between use of external equity and expenditure on R&D, this result suggests that external equity is a direct substitute for retained profits in firms engaged in a high level of R&D activity relative to turnover. This result is consistent with extensive empirical evidence indicating that venture capitalists fund new, innovative, often high-technology firms (Brierley 2001; Carpenter and Petersen 2002a; Ueda 2004). Additionally, the positive relationship between use of external equity and expenditure on R&D is consistent with studies indicating that firms with a higher level of investment in innovation are less averse to ceding control (Berggren et al. 2000; Hogan and Hutson 2005).

The positive relationship between use of external equity and size evident in Table 3.10 is consistent with previous research which states that providers of external equity, especially venture capital firms, target high-potential fast growth firms for investment (Brierley 2001). Additionally, venture capitalists generally require firms to have proven potential, and high sales growth rates (Leach and Melicher 2006), i.e. venture capitalists generally do not invest in start-ups with unproven technology. The positive relationship borne out in this study is not statistically significant, however.

Negative relationships between use of retained profits, and provision of firm owners' personal assets and firm assets as collateral indicates that, consistent with the pecking order theory, firms employ debt when retained profits are insufficient to

fund positive NPV projects. Use of collateralised debt finance to augment internal equity confirms the negative relationship between profitability and debt financing discovered in previous studies (Fu et al. 2002; Cassar and Holmes 2003; Sogorb Mira 2005), and provides further evidence of adherence to the pecking order theory of financing by SME owners.

Considered collectively, results of OLS regression models support a number of pecking order and agency theory explanations for observed capital structures, as well as supporting propositions of the financial growth life cycle model. Consistent with a central prediction of the life cycle approach, respondents become increasingly reliant on internal equity over time, as indicated by statistically significant positive relationships between use of retained profits and firm age and size. A statistically significant negative relationship between use of retained profits and provision of collateral indicates that reliance on internal equity is inversely related to debt. These results suggest that, progressing along a financial growth life cycle trajectory, respondents' financing choices are consistent with the pecking order theory (Myers 1984; Myers and Majluf 1984), selecting sources of finance representing the minimum intrusion into the firm. The statistically significant negative relationship between use of external equity and ownership structure suggests that adherence to the pecking order theory is even greater in closely held firms.

Results indicate that personal resources of the firm owner, combined with his propensity for risk, are extremely important in financing small firms. This is evidenced by statistically significant negative relationships between use of personal equity and firm size; and between use of personal equity and provision of personal assets to secure business loans. Consistent with empirical evidence from previous studies (Avery et al. 1998), these results provide further evidence for the pecking order theory, although the effect of potential supply-side constraints is indeterminable.

Statistically significant relationships between use of short-term and long-term debt and provision of collateral indicate that financial institutions employ asset-based lending techniques in attempting to overcome potential agency costs of debt. Significant results indicate that firm assets are important sources of collateral in securing short-term and long-term debt, whilst personal assets of the firm owner are important in securing short-term debt. A statistically significant negative relationship between use of long-term debt and age suggests maturity matching, and a statistically significant positive coefficient supports the hypothesis that long-term debt is positively related with size. These results are consistent with empirical evidence from previous studies (Bartholdy and Mateus 2008; Heyman et al. 2008), and emphasise the importance of collateralisable assets in securing both short-term and long-term debt. This finding is further emphasised by the statistically significant relationship between use of external equity and expenditure on R&D. In conclusion, although important theoretical explanations for capital structures are supported, a number of propositions are rejected because of a lack of statistical significance. This is particularly true in the case of debt models, and these issues are considered in the following section.

3.7 Examining Statistical Significance

The preceding discussion of regression coefficients of OLS models, whilst fairly typical of studies in economics and finance, does not address the magnitude and statistical significance of these results, or if economic explanations can be extracted from the coefficients. A difficulty in interpreting coefficients of regression models tested to investigate hypotheses in capital structure research is that it is impractical to attach a meaningful explanation to coefficients in real terms (Lambrecht and Myers 2007). For example, what is the difference between a regression coefficient of .40 and, say, .60, and what can this specifically tell us about choice of debt or equity? Issues of interpretation arise because researchers attempt to test hypotheses developed from a qualitative discussion in a quantitative manner, i.e. researchers are attempting to assign precise empirical values to general hypotheses. Because capital structure literature has developed in this way, a number of general hypotheses are supported statistically, but capital structure choice remains an enigma. One way in which this issue may be overcome is to formulate conditional hypotheses, i.e. specify relationships that are conditional on certain circumstances, scenarios, or characteristics.

It is appropriate to examine estimated coefficients nonetheless. Analysis of F values indicates that regression models for all six dependent variables are statistically significant at the 99 percent level of confidence. As is evident from Table 3.10, regression coefficients range in magnitude from −0.001 to 0.26. This indicates that whilst there are a number of statistically significant relationships supporting propositions of pecking order and agency theories, these relationships are not particularly strong. This may be due to a number of reasons, including; the categorical and dichotomous dummy nature of independent variables, relatively small sample size, and dependent variables expressed as percentages rather than in continuous form. The magnitude of regression coefficients is not dissimilar to previous research, including studies by Michaelas et al. (1999), Cassar (2004), and Sogorb Mira (2005), despite these studies utilising much larger databases. As data used in the latter studies was generally continuous rather than categorical, perhaps the small magnitude of coefficients is due to other factors. These may include; heterogeneity in financing across sectors; difficulty in modelling use of a number of sources of finance (for example, use of short-term debt is difficult to ascribe to firm characteristics); difficulty in defining and calculating appropriate proxy variables; and the fact that financing choice is not governed by firm characteristics alone.

The adjusted R square statistic indicates the percentage of total variation in the dependent variable that is explained by a regression model consisting of independent variables. Analysis of models in Table 3.10 indicates that 25.9% of variation in use of external equity is accounted for by independent variables; 16.2% of variation in use of personal funds and funds from "f" connections is accounted for by independent variables; 14.9% of variation in use of retained profits is accounted for by independent variables; 4.5% and 6.5% of variation in use of short-term and long-term debt respectively is accounted for by independent variables, and 12% of

variation in use of total debt is accounted for by independent variables. Whilst the overall model fit is respectable for equity models, it is rather low for debt models. This is not uncommon in SME research, and is similar to adjusted R squared values reported in regression models of Michaelas et al. (1999), Cassar (2004), and Sogorb Mira (2005), for example. In fact, considering the relatively small number of observations in the present study, the model employed performs admirably well in comparison with these studies, as Michaelas et al. (1999) utilise panel data with 3,500 observations, and Sogorb Mira (2005) examines panel data containing 6,482 observations. These results indicate that a substantial proportion of variation in use of debt is not accounted for by independent variables in the model employed. As stated previously, the lack of statistical significance for short-term debt may be due to the temporary nature of deficits covered by this source, "... lowering the importance of purely fiscal considerations" (Esperanca et al. 2003, p. 68). Another potential explanation is that opposing sectoral differences in use of short-term and long-term debt are not revealed by results of OLS regressions. Further explanations for use of short-term and long-term debt across industry sectors are examined in employing a generalisation of Zellner's SUR approach in the following section.

3.8 Heteroskedasticity

In order to make statistical inferences using coefficients generated by OLS regressions, a number of assumptions are made about the error term. A central assumption of OLS is that error terms are homoskedastic, i.e. that error terms have constant variance. Violation of this assumption, or heteroskedasticity, means that although OLS estimators are unbiased they are inefficient and standard errors are biased. Consequently, OLS estimators are not the best linear unbiased estimates, as there are alternative estimators which have lower variance. Because of this, confidence intervals or hypothesis tests cannot be accepted with confidence, as significance tests are invalidated. The effect of heteroskedasticity is that importance may be mistakenly attributed to a variable, i.e. the standard errors, "t" values, and R squared values are incorrect.

Assumption of equal variances of the error term was examined using the White test for heteroskedasticity. In the White test, squared residuals from estimated regression equations are regressed against a set of explanatory variables that is comprised of each independent variable from the original equation, the square of each independent variable, and the product of each independent variable times every other independent variable. A Chi-square test of significance of the equation is then computed and if the calculated statistic is bigger than the critical value, we conclude that error terms in the regression equation do not have common variance at the 95% level of confidence. An advantage of the White test is that the t-statistic associated with individual coefficient estimates may indicate the cause of heteroskedasticity, and, in turn, how the problem may be resolved.

Table 3.11 White heteroskedasticity-consistent coefficients

Independent variables	Owners' personal funds, and funds from "f" connections	Retained profits	External equity
	Model 1	Model 2	Model 3
Age	−0.002	0.030**	−0.008
	(−0.238) [0.812]	(2.01) [0.046]	(−0.820) [0.413]
Size	−0.031**	0.035*	0.010
	(−2.14) [0.033]	(1.77) [0.078]	(0.849) [0.396]
R&D	0.007	−0.098***	0.113***
	(0.431) [0.667]	(−3.22) [0.001]	(5.12) [0.000]
Own	0.028	0.078	−0.158***
	(1.23) [0.220]	(1.57) [0.118]	(−4.64) [0.000]
Owncoll	0.260***	−0.238***	−0.044
	(3.28) [0.001]	(−3.64) [0.000]	(−0.964) [0.336]
Intcoll	−0.033	−0.135***	−0.040
	(−1.41) [0.159]	(−2.58) [0.011]	(−1.50) [0.136]
Constant	0.186**	0.293**	0.022
	(1.96) [0.051]	(2.21) [0.028]	(0.298) [0.766]
Adjusted R^2	0.162	0.149	0.259
"F" Value	10.17	9.28	17.57
Significance of "F"	0.000	0.000	0.000

***, **, * Statistically significant at the 99%, 95% and 90% level of confidence respectively. t statistics in parentheses. Significance levels in square brackets

Significance of Chi-squared coefficients for the White test reported in Table 3.10 indicate that heteroskedasticity is present in models employing personal funds and funds from "f" connections, retained profits, and external equity as external variables. Levels of heteroskedasticity in these models are relatively low, as all are below 20%, indicating that whilst heteroskedasticity is present, its effect is relatively small. In these cases, equations were re-estimated using White's procedure for computing heteroskedastic-consistent standard errors and covariances, and results are reported in Table 3.11. As evidenced from results, the re-estimation makes no material difference to the size or significance of the regression coefficients, although standard errors and t statistics are slightly different, as evidenced with comparison of results in Table 3.10.

3.9 Investigation of Sectoral Effects

Theoretical propositions of agency theory suggest sectoral differences in capital structure, due primarily to inter-industry differences in asset structure. Whilst issues such as growth rates, investment requirements, and temporal factors may also influence inter-industry differences, the essential underlying influence is composition of a firm's assets. Empirical evidence suggests that sources of financing employed may vary significantly across sectors (Hall et al. 2000), although

Balakrishnan and Fox (1993) find that firm-specific effects rather than industry-specific effects contribute most to variance in capital structures. Previous studies have typically examined inter-industry differences in capital structures employing the dummy variable approach (Jordan et al. 1998). Multivariate regression models were estimated with industry dummy variables, and results are presented in Table 3.12. The reference sector chosen is the "computer software development and services" sector, as empirical evidence suggests that capital structures of firms in this sector are significantly different from others (Brierley and Kearns 2001).

Results presented in Table 3.12 indicate that there may be significant inter-industry differences in sources of finance employed. Statistically significant coefficients indicating negative relationships between use of external equity and all sectors except the "other" sector suggest important sectoral differences for this source. Whilst it is not evident if this result reflects preferences of funders or recipient firms, it indicates that firms in the "computer software development and services" sector differ significantly from other sectors in sourcing external equity finance. Similarly, negative relationships between use of short-term debt, and the "other" and both manufacturing sectors suggest significant differences in use of this source compared with firms in the "computer software development and services" sector. Finally, positive relationships between use of long-term debt and the "other manufacturing" and "distribution, retail, hotels, and catering" sectors suggest significantly greater use of this source than among firms in the "computer software development and services" sector. These results may be attributable to differences in asset structure, however this conclusion is refuted by the significant positive relationship between "other services" and use of long-term debt.

Although results of models employing industry dummies provide tentative support for sectoral differences in sourcing finance, a general lack of statistical significance precludes strong conclusions to this effect. One reason for observed results may be attributed to the choice of numeraire, which determines the significance of other variables. A further explanation is that inter-industry differences in relationships with independent variables may produce confounding, non-significant results. This is because the dummy variable approach only allows for an intercept effect, i.e. a one-off change in the dependent variable conditional on a sectoral grouping compared with a reference group. This approach assumes that the response of each sector to each independent variable is identical, which is contrary to empirical evidence (Hall et al. 2000). Because of these factors, a generalisation of Zellner's (1962) SUR approach was adopted to investigate sectoral effects. The SUR system has a number of advantages over other procedures. Firstly, the SUR approach has efficiency gains, i.e. estimated standard errors are smaller than when employing the ordinary least squares method. Secondly, the SUR method is a variant on calculating independent least squares models using the dummy variable approach. Dummy variables facilitate the assertion of differences between sectors by providing a statistical basis for sectoral differences. As noted above, this approach assumes that the response of each sector to each independent variable is identical. This is contrary to the stance of this research, which investigates the proposition that independent variables vary as between sectors. Attempting to

Table 3.12 Multivariate regression models employing industry dummies

	Internal equity			Debt		
	Owners' personal funds, and funds from "f" connections	Retained profits	External equity	Total debt	Short-term debt	Long-term debt
	Model 1	Model 2	Model 3	Model 6	Model 4	Model 5
Age	−0.007	0.023	−0.003	0.001	0.017	−0.016**
	(0.449)	(0.139)	(0.738)	(0.960)	(0.184)	(0.047)
Size	−0.031***	0.040**	0.013	0.024	0.013	0.011
	(0.006)	(0.046)	(0.306)	(0.162)	(0.428)	(0.279)
R&D	0.013	−0.101***	0.105***	−0.017	−0.019	0.003
	(0.452)	(0.002)	(0.000)	(0.547)	(0.457)	(0.873)
Own	0.025	0.069	−0.129***	−0.023	0.005	−0.028
	(0.387)	(0.176)	(0.000)	(0.600)	(0.898)	(0.286)
Owncoll	0.259***	−0.224***	−0.039	0.144**	0.137**	0.007
	(0.000)	(0.008)	(0.462)	(0.050)	(0.047)	(0.874)
Intcoll	−0.035	−0.144***	−0.028	0.257***	0.156***	0.101***
	(0.216)	(0.005)	(0.390)	(0.000)	(0.000)	(0.000)
Metal manufacturing and engineering	0.104**	0.158*	−0.100*	−0.146**	−0.168***	0.022
	(0.025)	(0.057)	(0.058)	(0.043)	(0.014)	(0.614)
Other manufacturing	0.041	0.082	−0.143***	−.017	−0.105*	0.088**
	(0.345)	(0.290)	(0.004)	(0.797)	(0.097)	(0.031)
Distribution, retail, hotels, and catering	0.037	−0.016	−0.102**	−0.015	−0.088	0.073*
	(0.393)	(0.839)	(0.040)	(0.828)	(0.170)	(0.076)
Other services	0.073	0.035	−0.158***	−0.018	−0.097	0.079*
	(0.161)	(0.702)	(0.008)	(0.825)	(0.203)	(0.106)
Other	0.074	0.035	−0.009	−0.165**	−0.185**	0.020
	(0.161)	(0.711)	(0.885)	(0.046)	(0.017)	(0.684)
Constant	0.148**	0.272**	0.069	0.139	0.123	0.016
	(0.052)	(0.046)	(0.426)	(0.240)	(0.270)	(0.820)
Adjusted R^2	16.7	15.7	28.2	13.6	5.7	7.4
"F" value	6.169	5.799	11.138	5.080	2.575	3.057
Significance of "F"	0.000	0.000	0.000	0.000	0.004	0.001

***, **, * Statistically significant at the 99%, 95%, and 90% level of confidence respectively. Reference sector is "computer software development and services". Significance levels in parentheses

calculate these effects using the least squares method would entail employing slope and intercept dummies for every variable, as done by Hall et al. (2000). A similar inclusion of slope dummy variables in the present study would have added another 30 variables to the right hand side of the model. The disadvantage of introducing a large number of dummy variables into the regression equation is in the number of degrees of freedom lost. This is generally not problematic when utilising extensive databases, but may be a more important issue when the number of cases is limited. The inclusion of 30 dummy variables into regression equations in the present study would substantially reduce the degrees of freedom, and weaken the generalisability of the regression results. Maximising the degrees of freedom improves generalisability and addresses both model parsimony and sample size concerns (Hair et al. 2006, p. 197). A further problem with adopting the dummy variable approach lies with the choice of the numeraire. The choice of numeraire can determine whether or not dummy variables are significant. Choosing a different numeraire changes the significance of the other variables.

The SUR model provides regression coefficients for each independent variable, one coefficient for each industry type, and these results are presented in tables at the end of this chapter, numbered 3.14–3.19 respectively. Firstly, means and standard deviations of dependent variables across sectors are presented as a one-way Anova in Table 3.13. Examination of descriptive summary statistics reveals significant sectoral differences in cross-sectional capital structures. One-way Anova "F"

Table 3.13 One-way Anova of the sources of financing employed by respondents across sectors

Industry	Owners' personal funds, and funds from "f" connections (%)	Retained profits (%)	External equity (%)	Short-term bank loans and overdraft (%)	Long- term debt (%)
Metal manufacturing and engineering	15 (0.27)	50 (0.41)	7.5 (0.17)	13.5 (0.26)	3 (0.09)
Other manufacturing	7 (0.17)	40 (0.36)	5.4 (0.16)	20.5 (0.25)	11.6 (0.23)
Computer software development and services	9.5 (0.20)	18 (0.33)	32.7 (0.41)	19.4 (0.35)	2.8 (0.10)
Distribution, retail, hotels, and catering	7.5 (0.22)	32.4 (0.39)	5.4 (0.19)	23 (0.33)	9.3 (0.25)
Other services	10.4 (0.26)	39.3 (0.41)	1.2 (0.05)	19.4 (0.33)	9.7 (0.21)
Other	12.6 (0.24)	35 (0.45)	21.2 (0.36)	12 (0.23)	4.7 (0.13)
Total	12 (0.22)	42 (0.39)	14 (0.27)	23 (0.30)	9 (0.19)
Significance value of the one-way Anova F statistic	0.478	0.003***	0.000***	0.446	0.076*

***, * Statistically significant at the 99% and 90% levels of confidence respectively. Standard deviations in parentheses. n=295

statistics indicate that these differences are statistically significant for use of retained profits, external equity, and long-term debt. Use of retained profits is most prevalent among firms in the "metal manufacturing and engineering" and "other manufacturing" sectors, constituting a mean of 50% and 40% of capital structures respectively. Use of retained profits is lowest among firms in the "computer software development and services" sector, constituting a mean of 18% of capital structure for firms in the sector. This result indicates that firms in all sectors other than the "computer software development and services" sector have a relatively greater reliance on internal equity, possibly reflecting the younger age profile of the latter.

Significant sectoral differences are also apparent in the use of external equity. Firms in the "computer software development and services" sector make greatest use of external equity, constituting a mean of 33% of capital structures. By contrast, external equity accounts for a mean of 5% of the capital structures of firms in the "other manufacturing" and "distribution, retail, hotels and catering" sectors. These sectoral differences are consistent with empirical evidence indicating that firms in the high-growth technology sector (typified by a high concentration of intangible assets) are less averse to ceding control, and are thus more likely to employ external equity from new investors than firms in other sectors (Berggren et al. 2000; Brierley 2001; Hogan and Hutson 2005).

Observed sectoral differences may be explained by industry effects, or alternatively, may be influenced by confounding effects of independent variables such as age and size. Results of the SUR approach which follow facilitate investigation of sectoral responses to each independent variable.

3.10 Results of Seemingly Unrelated Regression Models

One advantage of the SUR model is that standard errors of the estimates are reduced, and it is therefore a more efficient estimator of coefficients. Comparison of t statistics of coefficients in Table 3.10 with those in Tables 3.14–3.19 reveal evidence of slightly increased efficiency, as standard errors are smaller in all cases, evidenced by larger t-statistics and lower significance values. Improvements in efficiency are due to correlation in the disturbances of equations, as the SUR model takes account of the matrix of correlations of all equations (Baltagi 2005). Furthermore, the magnitude of statistically significant coefficients is generally greater for sectoral equations than for the model containing all respondents. The lower magnitude of coefficients in the model containing all respondents is accounted for when insignificant sectoral coefficients are combined with significant coefficients.

As outlined earlier, empirical evidence from previous investigations of sectoral differences in sources of financing employed is inconsistent. Whilst results presented by Michaelas et al. (1999) suggest that capital structures are industry dependent, other studies find that firm specific characteristics are more important

than sectoral effects (Balakrishnan and Fox 1993). Results from SUR models presented in Tables 3.14–3.19 suggest support for both positions.

Similarities in the direction of statistically significant coefficients in SUR models suggest that the influence of certain firm characteristic variables is constant across sectors for a number of sources of finance. This finding suggests that a number of financing issues are relevant for all SMEs, regardless of sector. For example, the influence of firm size is similar in a number of cases. A statistically significant positive relationship between use of retained profits and size for the total sample is repeated in respect of the "distribution, retail, hotels, and catering", and "other manufacturing" sectors, possibly reflecting the relatively older age profile in these sectors. This result suggests greater levels of retained profits for investment in these sectors, emphasising the importance of profitability in financing SMEs.

Reliance on personal sources of equity is particularly evident in firms with a smaller turnover, as it forms a greater percentage of investment finance, *ceteris paribus*. The negative relationship between use of personal savings and funds from "f" connections and firm size for the model for all respondents is also negative and statistically significant in respect of both manufacturing sectors. This is not an unexpected result, as the large amounts of investment capital required by manufacturing sectors are not typically sourced from personal resources. Another relationship for the model including all respondents replicated in three sectors is the positive relationship between use of personal sources of equity and provision of personal assets as collateral for business loans. This relationship is positive for all sectors, but is only statistically significant in respect of the "distribution, retail, hotels, and catering", "other services" and "other" sectors. These results emphasise a central feature of SME financing, i.e. the personal contribution of resources by the firm owner, although they cannot be generalised to all sectors in the sample.

A further similar result across sectors concerns provision of collateral to secure debt finance. Positive relationships between total debt and use of firm assets as collateral for all models except the "other" sector suggest that financial institutions employ asset-based lending techniques in advancing debt, regardless of sector. These relationships are repeated for all sectors in use of short-term debt, apart from "other" and "other services" sectors. Taken together, these findings suggest that collateral is a universal requirement for debt across all sectors, and is therefore a firm-specific, rather than a sector-specific effect. Findings are not as conclusive in the case of long-term debt, as positive relationships between provision of collateral and long-term debt are statistically significant for only two sectors; "computer software development and services", and "other services". Results concerning provision of collateral may be more convoluted, therefore, and are revisited in discussing potential sectoral differences in the following section.

Negative relationships between use of retained profits and provision of firm assets as collateral to secure debt is statistically significant for models including all respondents, and in the case of the "distribution, retail, hotels, and catering", "other services" and "other" sectors. These relationships are congruent with predictions of the pecking order theory, and are consistent across a number of sectors, although

lack of statistical significance precludes generalisation of this result to all sectors in the sample.

An explanation commonly offered for adherence of SMEs to the pecking order theory of financing is desire of firm owners to retain control of the firm and maintain independence, particularly in closely held firms (Poutziouris 2003). This explanation is supported by significant positive relationships between use of retained profits and closely held firms for the model including all respondents, and for the "metal manufacturing and engineering" and "other" sectors. Additionally, statistically significant negative relationships between use of external equity and closely held ownership structure in models containing all respondents, "metal manufacturing and engineering", "distribution, retail, hotels, and catering" and "other" sectors suggest that the issue of control is determined by ownership structure, rather than differing across sectors. In summary, results of SUR models suggest that the influence of firm characteristics such as size and ownership structure, provision of collateral to secure debt, and personal contribution of the firm owner, are common to a number of sectors. These findings provide tentative evidence that a number of firm characteristic variables rather than sectoral effects partly determine capital structures, although lack of statistical significance precludes generalisation across every sector in the sample.

Alternatively, further results suggest that sectoral effects are significant in determining capital structure. As outlined above, results presented in Table 3.19 reveal a statistically significant positive relationship between use of total debt and assets of the firm provided as collateral for all models, except the "other" sector, suggesting a firm characteristic rather than a sectoral effect. Further examination reveals sectoral differences, however. In circumstances where assets of the firm are insufficient to secure debt, the firm owner may provide personal assets to secure business loans (Fluck et al. 1998; Berger and Udell 1998). Statistically significant positive relationships between use of short-term and total debt, and provision of personal assets to secure business loans for firms in the "computer software development and services" sector is evident from results in Tables 3.17 and 3.19 respectively. This result suggests that firms in this sector secure firm debt using personal assets due to a lack of adequate tangible firm assets. The statistically significant negative relationship between use of external equity and provision of firm assets to secure business debt for firms in this sector implies further support for this proposal. These results provide evidence of the reliance of financial institutions on asset-based lending techniques to overcome potential moral hazard problems, which is relatively more difficult for firms in sectors typified by high levels of intangible assets. Additionally, these results are not inconsistent with the finding of Hogan and Hutson (2005), which proposes that high-technology firms requiring additional finance seek external equity before debt. Whilst results suggest that respondents in the "computer software development and services" sector provide personal and firm assets to secure debt finance, the statistically significant positive relationship between use of external equity and size for firms in this sector shown in Table 3.16 indicates that larger firms employ greater amounts of external equity. This result suggests that smaller firms in the "computer software development and services" sector may have

difficulty in securing external equity, thus employing debt finance. Lack of tangible firm assets to secure this funding means that firm owners must provide personal assets on which to secure business debt. In summary, results suggest that for firms in sectors typified by high levels of intangible assets, large firms have access to venture capital. Small firms may have greater difficulty accessing this source, and so employ debt secured on the personal assets of the firm owner.

Examination of the relationship between use of debt and expenditure on R&D highlights a significant feature of debt and equity markets for SMEs. The statistically significant positive relationship between use of external equity and expenditure on R&D for the "computer software development and services" sector supports the view that firms with inadequate tangible assets requiring finance for expenditure on intangible activity source external investment finance from equity rather than debt markets. Additional support for this proposition is evidenced in Tables 3.17 and 3.19. The relationship between use of short-term and total debt, and expenditure on R&D, is positive for firms in the "other manufacturing" sector, and negative for firms in the "computer software development and services" sector. This result suggests that firms in a sector typified by high levels of tangible assets ("other manufacturing") fund R&D with debt, whereas firms in a sector typified by high levels of intangible assets ("computer software development and services") fund R&D with external equity. This is particularly true when large amounts of funding are required by very high-tech firms (Ullah and Taylor 2005).

These findings suggest that sectoral effects are important in explaining capital structures in SMEs, and can be primarily attributed to sectoral differences in asset structures. Whilst results of SUR models indicate the common influence of firm characteristics across sectors, as well as sectoral differences in sourcing finance, interpretations and conclusions must be made with caution due to low levels of statistical significance.

3.11 Conclusions

This chapter presents results of statistical tests employed to test theories of capital structure. Results from multivariate models tested on respondents' financing data support a number of propositions of agency and pecking order theories, and are broadly consistent with evidence from previous empirical studies. Results of the OLS regression models emphasise (1) the increased use of internal equity as the firm develops over time, (2) the importance of provision of collateral in alleviating information asymmetries and securing debt finance, and (3) the significant contribution of the firm owner through contribution of equity, and provision of personal assets as collateral for business loans.

Use of retained profits is positively related with age and size of the firm, indicating that surviving firms become increasingly reliant on internal equity as accumulated profits are reinvested. This result is consistent with the pecking order theory, and suggests a tendency to employ capital which minimises intrusion into

the business. Another important source of internal equity is personal funds of the firm owner, and funds of friends and family, which are most important in firms with low turnover. Furthermore, results indicate that the firm owner contributes "quasi-equity" by providing personal assets as collateral for business loans. These contributions emphasise the importance of personal wealth of the firm owner in SME financing (Ang et al. 1995), and indicate the significance of the risk taking propensity of the firm owner in the financing decision (Elston and Audretsch 2009).

Results indicate that use of long-term debt finance is positively related with size of the firm, and negatively related with age. The latter result suggests maturity matching and indicates that firms increasingly use retained profits for investment projects as debt is retired over time. It also highlights the importance of provision of fixed assets as collateral to secure debt finance. Results indicate that SMEs with a high level of fixed assets overcome problems of asymmetric information by providing collateral to secure debt, as financial institutions seek to reduce potential agency costs of debt financing using asset-based lending techniques. In cases where there are insufficient lien-free firm assets to secure business loans, such as in firms typified by a high proportion of intangible assets, personal assets of the firm owner are an important source of collateral. Debt secured on personal assets of the firm owner is most prevalent among firms with low turnover, and among owners who also invest personal funds in the firm. This result emphasises the interconnection between business and personal risks, and highlights the reduced financing options of firms without access to collateralisable assets.

Firms with a higher expenditure on R&D employ higher levels of external equity and lower levels of internal equity. This result suggests that firms pursuing a high growth strategy typically do not have sufficient internal finance to meet their investment needs, and confirms the finding of Cressy and Olofsson (1997a), that owners of firms seeking to grow are less averse to ceding control than those not seeking growth. Closely held ownership structure is also negatively related to external equity and positively related to internal equity, confirming the well documented desire for independence and control of closely held firms.

Analysis of the variation in direction and magnitude of regression coefficients across sectors provides tentative evidence that the influence of a number of firm characteristic determinants such as size, ownership structure, provision of firm assets as collateral, and personal contribution of the firm owner are similar across sectors. Results of these analyses reiterate a number of salient findings from multivariate OLS tests. The common underlying factor in accessing debt finance is alleviation of information asymmetries, which is relatively easier for firms with a high level of fixed assets accessing debt markets, *ceteris paribus*. Firms engaged in a high level of intangible activity with low turnover and a low level of tangible assets have a greater reliance on external equity. Smaller firms engaged in a high level of intangible activity may not attract venture capital funding, and resort to debt finance secured on personal assets of the firm owner. In conclusion, whilst problems of information asymmetries are universal across the SME sector, accessing debt and equity markets is highly influenced by the asset structure of the firm, and the personal wealth and risk propensity of the firm owner.

Table 3.14 Regression coefficients of seemingly unrelated regression models employing "personal funds and funds from 'f' connections" as the dependent variable

	All	Metal	Manu	Computer	Hotel	Servs	Other
Age	−0.002	0.018	−0.006	0.005	−0.011	−0.010	0.000
	(−0.207) [0.836]	(0.531) [0.598]	(−0.448) [0.655]	(0.178) [0.859]	(−0.744) [0.459]	(−0.375) [0.711]	(−0.010) [0.991]
Size	−0.031***	−0.089**	−0.063***	−0.016	−0.008	−0.032	0.023
	(−2.96) [0.003]	(−2.52) [0.016]	(−3.25) [0.002]	(−0.627) [0.534]	(−0.368) [0.714]	(−0.868) [0.396]	(1.02) [0.320]
R&D	0.007	0.031	0.018	−0.009	0.081**	0.044	0.038
	(0.409) [0.683]	(0.452) [0.654]	(0.533) [0.596]	(−0.292) [0.771]	(2.07) [0.042]	(0.558) [0.583]	(1.09) [0.287]
Own	0.028	0.031	−0.023	−0.042	−0.021	0.137	0.068
	(1.06) [0.291]	(0.309) [0.758]	(−0.459) [0.648]	(−0.612) [0.543]	(−0.408) [0.684]	(1.66) [0.112]	(1.57) [0.136]
Owncoll	0.260***	0.123	0.148	0.155	0.344***	0.597***	0.560***
	(5.66) [0.000]	(0.697) [0.489]	(1.54) [0.129]	(1.45) [0.155]	(5.17) [0.000]	(2.94) [0.008]	(5.22) [0.000]
Intcoll	−0.033	−0.126	0.008	−0.040	0.017	−0.025	−0.035
	(−1.20) [0.231]	(−1.46) [0.151]	(0.161) [0.872]	(−0.529) [0.599]	(0.325) [0.746]	(−0.283) [0.780]	(−0.721) [0.480]
Constant	0.186***	0.370	0.331***	0.159	−0.003	0.094	−0.140
	(2.56) [0.011]	(1.58) [0.122]	(2.53) [0.014]	(0.930) [0.357]	(−0.023) [0.982]	(0.433) [0.669]	(−0.834) [0.416]

***, **, * Statistically significant at the 99% and 95% levels of confidence respectively. t statistics in parentheses. Significance levels in square brackets

Table 3.15 Regression coefficients of seemingly unrelated regression models employing "retained profits" as the dependent variable

	All	Metal	Manu	Computer	Hotel	Servs	Other
Age	0.030**	−0.039	0.023	0.034	0.030	0.035	0.000
	(2.04) [0.042]	(−0.782) [0.438]	(0.858) [0.395]	(0.837) [0.407]	(0.998) [0.322]	(0.769) [0.451]	(0.004) [0.997]
Size	0.035*	0.076	0.098**	−0.009	0.069*	0.031	−0.058
	(1.82) [0.069]	(1.44) [0.157]	(2.35) [0.022]	(−0.223) [0.824]	(1.71) [0.091]	(0.499) [0.622]	(−0.781) [0.445]
R&D	−0.098***	−0.148	−0.111	−0.053	−0.126*	−0.256*	−0.333***
	(−3.26) [0.001]	(−1.44) [0.157]	(−1.50) [0.138]	(−1.09) [0.278]	(−1.65) [0.103]	(−1.87) [0.076]	(−3.00) [0.008]
Own	0.078*	.266*	0.108	0.032	0.116	0.036	0.290**
	(1.62) [0.107]	(1.81) [0.079]	(1.00) [0.318]	(0.299) [0.766]	(1.14) [0.260]	(0.252) [0.803]	(2.09) [0.051]
Owncoll	−0.238***	−0.208	0.097	−0.220	−0.330***	−0.325	−0.203
	(−2.89) [0.004]	(−0.795) [0.431]	(0.475) [0.636]	(−1.32) [0.194]	(−2.55) [0.013]	(−0.929) [0.363]	(−0.590) [0.562]
Intcoll	−0.135***	0.006	−0.118	0.071	−0.288***	−0.267*	−0.381**
	(−2.74) [0.006]	(0.047) [0.962]	(−1.17) [0.249]	(0.611) [0.544]	(−2.90) [0.005]	(−1.76) [0.093]	(−2.43) [0.026]
Constant	0.293**	0.469	0.064	0.251	0.180	0.598	1.52***
	(2.26) [0.024]	(1.35) [0.186]	(0.229) [0.819]	(0.941) [0.352]	(0.677) [0.500]	(1.59) [0.126]	(2.83) [0.011]

***, **, * Statistically significant at the 99%, 95%, and 90% level of confidence respectively. t statistics in parentheses. Significance levels in square brackets

Table 3.16 Regression coefficients of seemingly unrelated regression models employing "external equity" as the dependent variable

	All	Metal	Manu	Computer	Hotel	Servs	Other
Age	−0.008	−0.017	0.004	0.005	−0.013	0.004	0.032
	(−0.816) [0.415]	(−0.859) [0.395]	(0.288) [0.774]	(0.123) [0.902]	(−0.871) [0.386]	(0.594) [0.558]	(0.831) [0.417]
Size	0.010	−0.008	−0.001	0.082**	0.019	−0.005	0.056
	(0.754) [0.451]	(−0.374) [0.710]	(−0.070) [0.943]	(2.10) [0.041]	(0.919) [0.361]	(−0.618) [0.543]	(1.03) [0.318]
R&D	0.113***	0.062	−0.044	0.203***	−0.001	−0.015	0.148**
	(5.90) [0.000]	(1.54) [0.131]	(−1.27) [0.210]	(4.20) [0.000]	(−0.014) [0.988]	(−0.792) [0.437]	(2.32) [0.034]
Own	−0.158***	−0.127**	−0.015	−0.151	−0.151***	0.013	−0.243**
	(−5.12) [0.000]	(−2.19) [0.034]	(−0.303) [0.763]	(−1.43) [0.159]	(−2.92) [0.004]	(0.655) [0.520]	(−2.39) [0.028]
Owncoll	−0.044	0.076	−0.109	−0.171	0.020	−0.019	−0.008
	(−0.833) [0.405]	(0.734) [0.468]	(−1.14) [0.258]	(−1.03) [0.307]	(0.303) [0.762]	(−0.393) [0.698]	(−0.033) [0.973]
Intcoll	−0.040	0.056	−0.034	−0.222*	−0.056	−0.011	0.203*
	(−1.28) [0.201]	(1.10) [0.276]	(−0.712) [0.479]	(−1.92) [0.062]	(−1.10) [0.273]	(−0.537) [0.597]	(1.77) [0.095]
Constant	0.022	0.143	0.170	−0.365	0.171	0.037	−0.728*
	(0.269) [0.788]	(1.04) [0.304]	(1.29) [0.202]	(−1.38) [0.174]	(1.27) [0.208]	(0.728) [0.474]	(−1.84) [0.082]

***, **, * Statistically significant at the 99%, 95% and 90% level of confidence respectively. t statistics in parentheses. Significance levels in square brackets

Table 3.17 Regression coefficients of seemingly unrelated regression models employing "short term debt" as the dependent variable

	All	Metal	Manu	Computer	Hotel	Servs	Other
Age	0.008	−0.005	0.050***	0.036	0.012	−0.050	0.027
	(0.676) [0.499]	(−0.167) [0.868]	(2.67) [0.009]	(0.941) [0.351]	(0.471) [0.639]	(−1.30) [0.206]	(0.786) [0.442]
Size	0.009	0.052	−0.035	−0.016	0.012	0.019	0.025
	(0.590) [0.555]	(1.61) [0.114]	(−1.20) [0.232]	(−0.443) [0.659]	(0.343) [0.732]	(0.356) [0.725]	(0.526) [0.605]
R&D	−0.011	0.067	0.108**	−0.118***	0.023	0.059	0.040
	(−0.464) [0.643]	(1.06) [0.297]	(2.11) [0.039]	(−2.57) [0.014]	(0.341) [0.733]	(0.500) [0.622]	(0.546) [0.592]
Own	−0.005	0.028	−0.012	−0.163	−0.076	0.206*	0.180*
	(−0.116) [0.907]	(0.314) [0.755]	(−0.156) [0.877]	(−1.63) [0.110]	(−0.843) [0.402]	(1.70) [0.104]	(1.97) [0.064]
Owncoll	0.129*	0.222	0.153	0.445***	0.056	−0.314	−0.077
	(1.91) [0.056]	(1.38) [0.177]	(1.07) [0.288]	(2.84) [0.006]	(0.496) [0.621]	(−1.05) [0.306]	(−0.338) [0.738]
Intcoll	0.147***	0.200**	0.119*	0.206*	0.264***	0.029	−0.040
	(3.64) [0.000]	(2.54) [0.015]	(1.70) [0.094]	(1.88) [0.067]	(3.03) [0.003]	(0.223) [0.825]	(−0.392) [0.699]
Constant	0.074	−0.281	−0.147	0.401	0.021	0.121	−0.243
	(0.692) [0.489]	(−1.31) [0.198]	(−0.758) [0.452]	(1.60) [0.116]	(0.092) [0.923]	(0.378) [0.709]	(−0.689) [0.500]

***, **, * Statistically significant at the 99%, 95% and 90% level of confidence respectively. t statistics in parentheses. Significance levels in square brackets

Table 3.18 Regression coefficients of seemingly unrelated regression models employing "long term debt" as the dependent variable

	All	Metal	Manu	Computer	Hotel	Servs	Other
Age	−0.015*	0.013	−0.033**	−0.031***	−0.004	−0.017	0.005
	(−1.92) [0.055]	(1.07) [0.292]	(−2.02) [0.048]	(−2.64) [0.011]	(−0.197) [0.845]	(−0.808) [0.428]	(0.220) [0.828]
Size	0.016*	0.004	0.040	0.011	−0.018	−0.014	0.008
	(1.65) [0.100]	(0.329) [0.743]	(1.58) [0.119]	(0.945) [0.349]	(−0.644) [0.521]	(−0.488) [0.630]	−(0.285) [0.778]
R&D	−0.001	−0.004	0.001	−0.019	0.015	0.122*	−0.026
	(−0.086) [0.930]	(−0.151) [0.880]	(0.027) [0.978]	(−1.39) [0.172]	(0.269) [0.788]	(1.93) [0.068]	(−0.601) [0.555]
Own	−0.011	−0.028	−0.165**	0.010	0.027	−0.109	0.057
	(−0.431) [0.666]	(−0.821) [0.416]	(−2.52) [0.015]	(0.341) [0.734]	(0.361) [0.719]	(−1.66) [0.112]	(1.05) [0.309]
Owncoll	0.014	−0.022	−0.016	−0.026	0.042	−0.194	0.194
	(0.334) [0.739]	(−0.361) [0.720]	(−0.129) [0.897]	(−0.542) [0.590]	(0.453) [0.651]	(−1.19) [0.246]	(1.44) [0.167]
Intcoll	0.110***	0.049	0.082	0.109***	0.106	0.202***	0.043
	(5.3) [0.000]	(1.62) [0.112]	(1.34) [0.187]	(3.29) [0.002]	(1.48) [0.143]	(2.87) [0.009]	(0.701) [0.492]
Constant	0.033	−0.040	0.178	0.104	0.098	0.050	−0.018
	(0.486) [0.627]	(−0.493) [0.625]	(1.05) [0.298]	(1.38) [0.174]	(0.512) [0.610]	(0.289) [0.775]	(−0.087) [0.932]

***, **, * Statistically significant at the 99%, 95% and 90% level of confidence respectively. t statistics in parentheses. Significance levels in square brackets

Table 3.19 Regression coefficients of seemingly unrelated regression models employing "total debt" as the dependent variable

	All	Metal	Manu	Computer	Hotel	Servs	Other
Age	−0.007	0.007	0.017	0.006	0.008	−0.067*	0.032
	(−0.521) [0.602]	(0.237) [0.813]	(0.716) [0.477]	(0.157) [0.876]	(0.286) [0.775]	(−1.70) [0.103]	(0.933) [0.363]
Size	0.026	0.057*	0.005	−0.006	−0.006	0.005	0.033
	(1.54) [0.124]	(1.73) [0.092]	(0.141) [0.888]	(−0.172) [0.864]	(−0.169) [0.866]	(0.089) [0.929]	(0.680) [0.505]
R&D	−0.013	0.063	0.109*	−0.137***	0.038	0.181	0.013
	(−0.488) [0.626]	(0.994) [0.327]	(1.69) [0.096]	(−3.24) [0.002]	(0.518) [0.606]	(1.51) [0.146]	(0.177) [0.861]
Own	−0.015	0.000	−0.176*	−0.152*	−0.049	0.097	0.238**
	(−0.363) [0.716]	(0.001) [0.999]	(−1.88) [0.066]	(−1.65) [0.106]	(−0.505) [0.615]	(0.780) [0.444]	(2.62) [0.018]
Owncoll	0.143**	0.199	0.137	0.419***	0.098	−0.508	0.119
	(1.99) [0.047]	(1.23) [0.226]	(0.761) [0.449]	(2.90) [0.006]	(0.799) [0.427]	(−1.66) [0.112]	(0.527) [0.605]
Intcoll	0.257***	0.248***	0.201**	0.315***	0.370***	0.230*	0.000
	(5.96) [0.000]	(3.14) [0.003]	(2.28) [0.027]	(3.11) [0.003]	(3.91) [0.000]	(1.74) [0.097]	(−0.004) [0.997]
Constant	0.107	−0.321	0.031	0.505**	0.119	0.171	−0.258
	(0.942) [0.347]	(−1.49) [0.145]	(0.128) [0.898]	(2.18) [0.034]	(0.470) [0.639]	(0.523) [0.607]	(−0.733) [0.473]

***, **, * Statistically significant at the 99%, 95% and 90% level of confidence respectively. t statistics in parentheses. Significance levels in square brackets

Chapter 4
SME Owners' Financing Preferences

In small businesses and entrepreneurial firms, managerial beliefs and desires will play an especially important role in determining capital structure. . . models must include the role of management preferences, beliefs, and expectations if we are to better understand capital structure policy

(Norton 1991, p. 174)

4.1 Introduction

Academic studies investigating the financing of SMEs commonly examine the subject by conducting multivariate regression analysis employing panel data sets consisting of accounting and finance data (see Appendix B for a comprehensive review of this literature). Researchers adopting this approach seek to explain financing choice in terms of firm characteristics such as firm size, age, asset structure, profitability, growth opportunities, and legal organisation. This methodology, whilst beneficial in theory testing and preliminary benchmark studies, neglects one of the most important aspects of small business and entrepreneurship: the central role of the SME owner. Given the primary decision making role of the firm owner, this method excludes a fundamental element of the financing and finance provision in SMEs. The approach adopted in this chapter is to record SME owners' views on financing their businesses, and the reasons why they choose one type of finance over another, or why they avoid some forms of financing entirely. Whilst this approach may appear self-evident or overly simplistic, it can reveal explanations for observed capital structures and how financial markets and institutions might better respond to the needs of the small business community.

In this chapter, respondents' replies to questions and statements posed in the form of five point Likert questionnaire items are presented and analysed. These replies reveal preferences for financing and a number of related aspects, including opinions on, and attitudes towards, strategic and motivational issues. Respondents' financing requirements are also detailed, along with preferred source of funds to meet those requisites. Analysis of stated preferences and motivations sheds light on

C. Mac an Bhaird, *Resourcing Small and Medium Sized Enterprises*,
Contributions to Management Science,
DOI 10.1007/978-3-7908-2399-8_4,

quantitative results presented in previous chapters and contextualises findings, constituting a second level of analysis of respondents' capital structures. This chapter has three sections. The first section considers the question "*What* are respondents' financing preferences?." The second section investigates potential reasons for these preferences, examining "*Why* respondents have these preferences?." The third section investigates the influence of signalling, timing, and debt tax shield considerations on respondents' financing decisions.

Data is presented according to the manner in which it was requested. Responses to questions are aggregated, where appropriate, and tabulated. Data collected by means of Likert scales is presented in a similar manner to Graham and Harvey (2001) and Bancel and Mittoo (2004), as respondents' answers are analysed by calculating two measures of significance. These are the mean score of the five point Likert scale for each answer, and a significance measure which is computed as the percentage of firms that responded "strongly agree" or "agree" to each question. Quantitative presentation of data is supplemented by direct quotes from respondents when applicable. Supplementary tables, primarily documenting sectoral differences, are provided in Appendix D, and are labelled D1, D2, D3, and so forth.

This chapter proceeds as follows: firstly, respondents' financing preferences are ascertained by presenting and analysing responses to a number of interrelated questions. These questions investigate respondents' declared financing preferences; additional external financing requirement and preferred source of funding to meet that need; and perceptions on the greatest internal growth constraints of the firm. Secondly, potential explanations for respondents' financing preferences are explored. Questions are posed seeking attitudes on maintaining control of the firm; important considerations when raising debt and equity; perception of information asymmetries in debt and equity markets; and the financial objectives of respondents. Thirdly, respondents' views on propositions of signalling, timing, and trade-off theories developed in corporate finance are analysed to ascertain their applicability to SME financing. The chapter concludes by considering implications of respondents' preferences and motivations for the financing decision, and consequently capital structures.

4.2 Respondents' Financing Preferences

A palpable method of ascertaining explanations for the financing decision of SME owners is to pose direct questions, as put succinctly by Weaver (1993): "... Why don't we just ask them?'. Whilst respondents' preferences and requirements may not precisely correspond with observed capital structures, replies provide important evidence for motivations behind the financing decision. Specifically, the central research question is directly addressed by posing the questions 'What are the financing preferences of respondents?,' and 'Can they be explained with reference to theories of capital structure?".

A number of related statements were posed on the survey instrument to ascertain if SME owners' financing preferences were consistent with predictions of the

Table 4.1 Respondents' stated financing preferences

	Strongly agree or agree (%)	Mean score
I prefer to use retained profits as much as possible (n = 289)	89.3	1.66
I issue external equity only as a last resort (n = 281)	60	2.27
A long-term bank loan would suit my investment needs (n = 287)	48.1	2.7

pecking order theory. These statements were developed with reference to theoretical and empirical literature, and questionnaire instruments employed in previous studies (Cressy and Olofsson 1997b; Michaelas et al. 1998; Hogan 2004). Respondents' replies are reported in Table 4.1.

Respondents' replies to the first statement indicate a strong preference to fund investment needs using internal equity, with almost 90% preferring to "use retained profits as much as possible." This response explains the observed increase in use of retained profits over the life cycle of the firm reported in Table 2.2. This result indicates that whilst respondents' capital structures are influenced by personal preferences of firm owners, financing choice is primarily dependent on rates of profitability. Observed preference for internal equity confirms empirical evidence from previous studies (Michaelas et al. 1998; Ou and Haynes 2006; Cole 2008), and is consistent with propositions of the pecking order theory. A number of comments on completed survey forms reiterate this preference:

> *Like most reasonably successful enterprises, most of our financial needs are met out of retained profits or cash flow. We could not envisage a situation in which we would seek to raise equity from an outside source.*

> *We are self-financing, requiring no debt or equity and generate all capital requirements from cash flow. Thankfully minimum/no interference from banks/venture capitalists/shareholders allows us to get on with our business.*

Respondents' replies to the second proposition in Table 4.1, "I issue external equity only as a last resort," demonstrate a general aversion to raising external equity finance. 60% of respondents state they would issue external equity only as a last resort, whilst 13% disagree with this proposition. These percentages are consistent with empirical evidence (Ou and Haynes 2006), and partly explain the relatively low use of external equity reported in Table 2.2. This response is congruent with a principal proposition of the pecking order theory, that raising additional external equity is the least favoured source of finance. Sectoral differences in responses are evidenced by the cross tabulation presented in Table D.1, although low values of directional coefficients in Table D.2 indicate that these relationships are weak. Firms in the "computer software development and services" and "other services" sectors comprise over 50% of those disagreeing with this proposition. This latter result is consistent with the finding that firms in sectors typified by technological development are less averse to ceding control than firms in other sectors (Berggren et al. 2000; Brierley 2001; Hogan and Hutson 2005). Respondents' aversion to raising external equity finance is reiterated by a number of comments on completed questionnaires:

Our company is privately owned and with the exception of a BES investment which has been repaid in full, the company does not raise equity from outside or from its existing owners.

Having recently extracted ourselves from a venture capital company, I would strongly recommend that companies pursue every other means of financing including re-mortgaging of their own residence, as the cost of exit far exceeds that of mortgage payments.

Almost 50% of respondents agreed with the third statement in Table 4.1, that "a long-term bank loan would suit their investment needs." Twenty-five per cent of respondents disagreed with this proposition, whilst 25% expressed no opinion. This result suggests that debt is either unsuitable or not required by 50% of respondents. The latter contention is suggested by the age profile of respondents, and is consistent with the findings of Ray and Hutchinson (1983), that a significant number of SMEs do not employ long-term debt finance. Sectoral differences in responses to this statement are evident from data presented in Table D.3. Firms in the "computer software development and services" and "other services" sectors comprise over 40% of those in disagreement with this proposition. Whilst this result is consistent with findings from previous research (Brierley and Kearns 2001), it is not apparent if this sectoral effect is due to demand-side choices, supply-side restrictions, or a combination of both. A number of comments on completed questionnaires indicate that contrasting sectoral beliefs are due to differences in asset structure:

[We operate in a]..High risk business with [a] low level of fixed assets.

[We are a] Service based company – therefore [we have] no significant assets to secure against.

Banks [are] too restrictive – [they] want collateral and personal guarantees. Having [a] good solid financial personal backer is more suitable for smaller companies.

Other potential explanations for observed sectoral differences, such as attitudes to maintaining control of the firm, and ownership structure are explored later in this chapter. Willingness of respondents to employ debt may be understated, due to a reluctance to apply for debt financing for fear of refusal as proposed by the "discouraged borrower's theory" (Kon and Storey 2003). This issue is investigated further in a following section when detailing respondents' perceptions of difficulties in raising additional external finance.

Evidence provided above suggests that observed financing choices are broadly consistent with propositions of the pecking order theory (Myers 1984; Myers and Majluf 1984), as respondents cite a preference to employ retained profits in the first instance, a willingness to employ debt, and express a general aversion to external equity. Stated preferences of firms in the "computer software development and services" and "other services" sectors suggest that deviation from this pecking order may be due to sectoral differences, including differences in asset structure. These variations may affect both demand for, and supply of finance, as financial institutions commonly require collateral to reduce exposure to potential agency-related problems of moral hazard. Preferences outlined above support and explain statistically significant results of multivariate analyses in Chap. 3, and use of financing across age groups discovered in bivariate analyses in Chap. 2.

4.3 External Financing Requirement

One approach to ascertaining financing preferences of respondents is to investigate the preferred source of funds to meet an additional external financing requirement. Respondents were asked to indicate immediate and short-term additional external financing requirements, and the preferred source of funds to meet that need. Respondents' external capital requirements are reported in Table 4.2. Almost two thirds of respondents require neither additional debt nor equity financing immediately. Viewed in conjunction with previous results, this finding suggests that retained profits are sufficient to meet the immediate investment financing needs of these respondents. Whilst this result is consistent with empirical evidence (Vos et al., 2007), it may also be symptomatic of a lack of desire for growth. Of those reporting a requirement for additional external financing, the majority require debt. Of those requiring debt immediately, almost 80% are in sectors typified by high levels of fixed collateralisable assets (all sectors except "computer software development and services" and "other services"). Of those requiring additional equity immediately, over 35% are in sectors typified by low levels of fixed collateralisable assets (the "computer software development and services" and "other services" sectors). These patterns are repeated for external financing requirements within the next 3 years. Respondents' requirements suggest that preferences for external financing may be influenced by the asset structure of the firm. This result reiterates preferences indicated in the previous section, and is consistent with empirical evidence from previous studies (Brierley and Kearns 2001). An implication of this finding for the financing decision of respondents is that firms lacking lien-free collateralisable assets may be reluctant to apply for long-term debt, leading to underinvestment.

Whilst these results indicate that asset structure may be a determining factor in preferred source of financing, the extent of potential supply-side restrictions is not evident. It is thus not possible to ascertain whether respondents' financing choices follow the pecking order theory (Myers 1984; Myers and Majluf 1984), in which external equity is the "source of last resort," or a modified pecking order, in which external equity is preferred before debt financing (Hogan and Hutson 2005), (although evidence presented in following sections indicates the latter). Furthermore, it is not possible to quantify the potential amount of underinvestment precisely, due to a reluctance to apply for debt by "discouraged" borrowers.

Table 4.2 Respondents' present and future funding requirements

Funding Requirement	Percentage of respondents requiring additional debt or equity capital	Percentage of those requiring additional funding perceiving difficulty in raising finance
Debt now (n = 263)	34	22
Debt in the next 3 years (n = 256)	61	18
Equity now (n = 256)	23	47
Equity in the next 3 years (n = 245)	37	40

In summary, debt is the required source of immediate and short-term external financing for the majority of respondents. This preference is consistent with the pecking order theory (Myers 1984; Myers and Majluf 1984), and may be influenced by a firm's asset structure.

4.4 Perceived Availability of Finance

Although investigation of a financing constraint is not a principal focus of this study, it is important to address the issue of a perceived financing constraint, as it may have a significant influence on the financing decision. The questionnaire enquired of the sample if they perceived difficulty in raising the additional debt or equity financing required. Eighty per cent of respondents replied in the negative. This result provides *prima facie* evidence that respondents generally do not perceive a financing gap to the extent that their additional external financing requirements will be fulfilled. This finding is consistent with Mulcahy's (2005) contention of the lack of evidence for a systematic funding gap in the Irish context, and challenges the conclusions of successive government surveys (Department of Enterprise, Trade and Employment 1992, 1995, 2002) which imply a lack of equity capital to SMEs. Furthermore, this result suggests that respondents are not operating under a constrained pecking order, and that if firms are operating under a truncated pecking order it may be explained with reference to financing preferences.

Interestingly, those respondents perceiving greatest difficulty in raising finance require additional equity. As documented in Table 4.2, 47% and 40% of those requiring equity now and in 3 years respectively perceive difficulty in raising the finance required; whereas 22% and 18% reporting an additional debt requirement now and in 3 years respectively perceive a similar difficulty. This result is confirmed by statistically significant directional measures for equity financing presented in Table D.5, although low values for test statistics indicate that these relationships are weak.

This finding is consistent with evidence from a number of studies indicating that a financing gap, if one exists, is experienced by a minority of firms in specific sectors (Colombo and Grilli 2007; Ullah and Taylor 2007). Additionally, this result suggests that asset structure may be correlated with firm owners' perception of success in raising additional external financing. Firm owners with access to collateralisable assets may indicate a preference for debt for two reasons. Firstly, they are of the perception that financial institutions require collateral to secure debt financing. Secondly, it suggests that they are relatively confident of securing the required debt because they have access to collateralisable assets. Respondents requiring additional equity finance are not as confident of success in securing the capital they require. This may be further complicated by differences between the firm owner and equity provider about deal structure, equity share, and valuation, as reflected by respondents' comments in relation to the availability of funding:

[We are a] Niche software house – [it is] difficult to get recognition in mainstream equity houses.

Company valuations in our market sector are depressed at present.

[A potential] Equity provider may not agree with our valuation.

The challenge of raising additional external equity is compounded by issues of market sentiment, and sectoral and temporal effects, especially trends in investment patterns:

[Speaking] As a technology company the banks and VCs are now clearly risk averse. VCs want a finished product rather than potential. The only sources [of finance] are private investors.

[We operate in a] Difficult sector (telecoms) [which is] in [a] down cycle. Bio-techs [are] getting the money and in fashion with VCs.

[Difficulties are] A function of the business sector and market sentiment at the time of raising equity.

Sectoral differences in perception of difficulty in raising finance are confirmed by results presented in Table D.6. Over 40% of those perceiving difficulty in raising finance are in the "computer software development and services" and "other services" sectors; sectors typified by low levels of collateralisable assets. Sectoral differences in perception of difficulty in raising finance are statistically significant, as observed by low significance values for Goodman and Kruskal tau, and uncertainty coefficients presented in Table D.7, although low values for both test statistics indicate that the relationship is a weak one.

These results suggest that firms in sectors typified by low levels of tangible assets requiring additional equity finance perceive the greatest difficulty in securing additional external finance. It is not immediately apparent to what extent this perception is a supply-side or a demand-side effect, although respondents' comments on completed surveys indicate that it may be explained by financiers' assessment of risk:

Non availability of risk capital. Lack of tangible assets for debt security. Venture capitalists target industries/sectors. Raising capital from other sources depends on perceived risk assessed purely on a financial basis.

[We have an] ..Uneven flow of orders [which is] seen as high risk to investors. [Our].. Trading profile does not conform to potential lenders' (or providers of capital) standard requirements.

Irish banks and venture capitalists take no risks. They always require endless security.

[Our] Company is a contracting/service co. Discounters are not comfortable with this type of debt.

Declining margins and business environment.

[We operate in a] Seasonal mid risk business that is employee based – [we are] perceived as high risk.

Respondents' comments concerning perceived difficulties in raising additional finance indicate concerns about primary factors in raising both debt and equity capital. Perceived difficulties in sourcing debt finance focus on risk profile,

uncertainty in income stream, asset structure and related collateral issues. Concerns about raising external equity are centred on issues of valuation, stage in the business cycle, market sentiment, and sectoral and temporal effects, especially trends in investment patterns. An effect of these perceptions is that firm owners may be discouraged from seeking external financing because of a perception that their applications will not be successful (Levenson and Willard 2000; Kon and Storey 2003), resulting in underinvestment. Firm owners' perceptions may thus influence the financing decision, and ultimately the capital structure of the firm.

These findings are consistent with the pecking order theory (Myers 1984; Myers and Majluf 1984); if a firm owner applies for, and is denied financing, he may terminate his search (truncated pecking order) or seek a less preferred source of financing (pecking order). These results also provide evidence of the effect of financial institutions' reliance on asset-based lending techniques to overcome potential agency problems of moral hazard when advancing debt finance. Firms in sectors typified by low levels of collateralisable assets are less likely to apply for debt than firms in sectors with high levels of collateralisable assets. Additionally, respondents perceive difficulties in raising external equity due to the cyclical nature of venture capital markets and valuations of equity providers. Respondents thus reveal an understanding that difficulties in raising finance are due to a combination of firm characteristic factors (lack of collateralisable assets), as well as supply-side factors (investment patterns of venture capitalists, and financial institutions' proclivity for collateral to secure debt finance).

4.5 Perceived Internal Growth Constraints

Whilst numerous government policy and academic papers allude to difficulties in obtaining additional external finance as one of the greatest difficulties facing SMEs (Reid 1996; OECD 2006; Blumberg and Letterie 2008), empirical evidence indicates that the most important source of finance for the sector is retained profits (Ou and Haynes 2006; Vos et al. 2007; Cole 2008). A number of studies indicate that firm growth is primarily dependent on profitability (Carpenter and Petersen 2002b), as some firm owners are unwilling to employ additional external financing due to the loss of control (Howorth 2001), or added business risk (Mishra and McConaughy 1999). The sample was asked what factors they perceived to be the greatest internal constraint on the growth of their firm. Presented with a list of ten commonly-cited constraints, respondents were asked to rank the factors from one to ten in order of perceived importance. Respondents' perception of the three most important perceived constraints to firm growth is reported in Table 4.3.

Respondents perceive low profits to be the greatest internal constraint on firm growth. This view reiterates the primary importance of profitability in providing the preferred source of financing for the firm, and is consistent with empirical evidence from previous studies (Ou and Haynes 2006). An implication that may be drawn from this observation is that firms are unable or unwilling to undertake positive net

Table 4.3 Respondents' perception of internal growth constraints

	Top three constraints (%)	Mean score
Low profits (n = 240)	65	3.25
Inadequate expenditure on R&D (n = 214)	26	5.65
High debt/equity ratio (n = 219)	36	5.14
Deficiency in management skills (n = 234)	51	3.99
Difficulty in accessing new markets (n = 240)	54	3.73
Difficulty in raising finance for plant and equipment (n = 205)	17	6.75
Inadequate short-term finance (working capital) (n = 219)	34	5.1
Inadequate marketing and advertising (n = 232)	34	5.03
Inadequate focus on new product development (n = 228)	33	5.1
Covenants and restrictions already in place (n = 205)	15	7.35

present value projects in the absence of adequate retained profits, suggesting that growth of small firms is constrained by the amount of internally generated equity (Carpenter and Petersen 2002b).

It is important to note that respondents do not report an immediate financing constraint *per se* – shortage of working capital is not one of the top three perceived growth constraints. Although outside the remit of the present study, responses to this question also shed light on perceived internal growth constraints of SMEs. Whilst lack of access to finance is commonly reported as the greatest obstacle faced by SMEs (Fazzari et al. 2000; Von Kalckrueth and Murphy 2004), other issues generally receive less attention, particularly in formulation of government policy. Respondents note a deficiency in management skills and difficulty in accessing new markets as the two most important constraints to growth after profitability. Although not directly related to the research question, these factors may have a direct impact on the profitability of the firm, and consequently on the financing decision and the external financing requirement. These findings have important policy implications, and suggest that rather than concentrating on the supply of finance to the sector (particularly to start-ups), government policy should concentrate on providing non-financial supports to the sector, particularly in the areas of management and marketing.

4.6 Explanations for Respondents' Financing Preferences

Results from the previous section indicate that respondents have a preference to source finance for positive NPV projects from retained profits. Analysis of respondents' perception of the greatest internal constraints on firm growth emphasise the importance of profitability in financing SMEs. When internal profits are insufficient to fund investment, the majority of respondents have a preference for debt. Results suggest sectoral differences in preferences for financing, along with perceptions of likely success in obtaining finance. These findings are broadly consistent with propositions of pecking order and agency theories, and contextualise observed financing data reported in Chaps. 2 and 3.

In the following sections, potential explanations for stated financing preferences are investigated by asking a number of interrelated questions, including; "What are respondents' perceptions of funders and their requirements?'; "What are respondents' views on maintaining control of the firm?'; "What are the primary financial objectives of respondents?" and "What are the most important considerations when raising debt and equity finance?." In employing a number of questions from different perspectives, this study endeavours to obtain a comprehensive, holistic account of explanations for observed capital structures. Analysis of responses to these questions in following sections provides supporting evidence for respondents' stated financing preferences.

4.7 Control and Managerial Independence

One reason commonly cited for financing preferences of SME owners is the desire for managerial independence and maintaining control of the enterprise. This issue was highlighted in early research examining the financing of SMEs (Bolton Committee 1971), and has been confirmed in subsequent studies (Chittenden et al. 1996; Berggren et al. 2000). Empirical evidence indicates that desire to retain control of the firm is typically dependent on the aspiration for growth (Cressy and Olofsson 1997b). In the event that external funding is required for positive NPV projects, and all other sources of finance are exhausted apart from external equity provided by new investors, the firm owner may consider relinquishing equity to fund the project (which is also dependent on the willingness of funders to supply equity finance). Firm owners for whom control of the firm is a primary objective will not employ additional external equity (Holmes and Kent 1991; Howorth 2001), whilst firm owners for whom growth is a primary motivation may seek to raise equity from new investors. In the latter case, firms commonly require large amounts of finance and do not have the cash flow to service regular repayments on debt. They present attractive investment opportunities for equity funders because of the potential for high growth in a relatively short time period (Smith and Smith 2004). These firms, therefore, more commonly employ external equity rather than debt financing. Respondents' attitudes towards ownership are reported in Table 4.4. Almost three quarters of respondents state that they wish "to retain a majority shareholding in the business for the founder."

This result is consistent with evidence from previous studies (Ou and Haynes 2006), and partly explains the relatively small proportion of venture capital observed in respondents' capital structures (5% of total financing, as shown in Table 2.2). This result also explains respondents' preferences for funding detailed

Table 4.4 Respondents' views on maintaining control of the firm

	Strongly agree or agree (%)	Mean score
Retain a majority shareholding (>50%) in the business for the founder (s) (n = 284)	73.2	1.93

in Table 4.1, i.e. a preference to fund investment with retained profits, and an aversion to external equity, which are consistent with the pecking order theory (Myers 1984; Myers and Majluf 1984).

Empirical evidence from previous studies indicates that desire to retain control of the firm varies across ownership structures, as owners of closely held firms have a greater desire to retain control than firms with a wider shareholding (Poutziouris 2001; Gallo et al. 2004; Blanco-Mazagatos et al. 2007). Results presented in Table D.8 concur with this evidence, as respondents of firms with a closely held ownership structure demonstrate a greater desire to retain control than firms with a more widely held ownership structure. This result confirms the statistically significant negative relationship between use of external equity and the variable "closely held ownership" shown in the multivariate regression output in Table 3.10. This result is consistent with empirical evidence indicating that retaining control of the firm and maintaining managerial independence is of primary importance because of succession issues (Gallo et al. 2004; Lopez-Gracia and Sanchez-Andujar 2007). Owners of closely held firms may therefore eschew growth opportunities, as desire for control is of first order importance.

Results of previous studies suggest that desire to retain control of the firm varies across sectors, in particular that technology development is negatively correlated with control aversion (Berggren et al. 2000). Similarly, Hogan and Hutson (2005, p. 384) find that owner-managers of New Technology Based Firms (NTBFs) would "...prefer to own a small proportion of a large company rather than own the whole of a much smaller business". By selling an equity stake in the business, owners acquire the necessary capital to grow the firm, perhaps into a large company. An inter-industry comparison reported in Table D.9 reveals that respondents in the "distribution, retail, hotels, and catering," and manufacturing sectors are most concerned about retaining control of their firms. Sixty per cent of firms within the "computer development and services industry" either have no preference or disagree with this statement, confirming results of previous studies (Berggren et al. 2000; Hogan and Hutson 2005). Significance values for directional measures presented in Table D.10 indicate that these relationships are statistically significant, although low values for test statistics indicate they are weak.

Comparison of results in Table D.9 with parameter estimates of SUR models presented in Chap. 3 confirms this pattern for a number of sectors. As shown in Table 3.16, negative relationships between use of external equity and closely held ownership are statistically significant in models for the "metal manufacturing and engineering," "distribution, retail, hotels, and catering," and "other" sectors, and for the model containing all respondents. Considered together, these results emphasise the primary influence of ownership structure on the financing decision, particularly a stated aversion to employing additional external equity. Combined evidence suggests that a firm's capital structure is dependent on the SME owner's desire for control.

In summary, almost three quarters of respondents indicate a desire to maintain control of the firm. This motive is incompatible with employing external equity from new investors, and partly explains adherence by respondents to the pecking

order theory as evidenced in financing data reported in Table 2.2, and statistically significant relationships in multivariate models presented in Table 3.10. Results indicate that desire to retain control differs across ownership structures, as respondents in closely held firms indicate a relatively stronger desire to maintain control than respondents in firms with a wider ownership structure. This objective also varies across sectors, being relatively weaker for firms in the "computer software development and services" than in other sectors.

4.8 Perception of Funders and Their Requirements

One of the most prominent issues in SME financing are the oft-examined information asymmetries in financial markets (Watson and Wilson 2002), frequently attributed to a lack of detailed, standardised, publicly available financial information on firms in the sector (Berger and Udell 1998). Firms applying for external finance may consequently be unsuccessful because of agency-related effects of adverse selection. This may impinge particularly on young firms with no trading history, or on firms developing new technologies or producing new products untried in the marketplace. In these instances default risk to the funder may not be greater than in established, traditional sectors, but the applicant may be denied funding because of a perceived higher risk of failure. Funders seek to counter default risk by employing screening, contracting, and monitoring mechanisms. These mechanisms are relatively more costly to firms in the SME sector (Cassar and Holmes 2003), and may affect the cost and/or supply of finance (Stiglitz and Weiss 1981). Firm owners' perceptions of information asymmetries in financial markets, combined with their understanding of funders' mechanisms to counter them may influence the financing decision.

Respondents' perceptions concerning issues related to funders and their lending practices are reported in Table 4.5. Almost 50% of respondents are of the perception that "banks understand their business," with 20% disagreeing with this proposition. This result indicates that respondents generally do not perceive information asymmetries in debt markets. This finding may be explained with reference to the

Table 4.5 Respondents' perception of funders and their requirements

	Strongly agree or agree (%)	Mean score
Banks understand my business (n = 291)	47.1	2.7
Banks are willing to provide overdraft facilities to my company (n = 294)	86.4	1.9
Providers of debt insist on collateral (n = 284)	83.8	1.8
Banks lend to companies with cash/fixed assets (n = 291)	81	2
Venture capitalists invest in companies with cash/fixed assets (n = 283)	34	2.8
The availability of venture capital is susceptible to market fluctuations (n = 282)	65	2.2

age profile of respondents, thus consistent with Diamond's (1989) reputation theory, information asymmetries lessen as firms mature and become established. Even in the event of bank switching, surviving firms have developed a credit history. A cross-tabulation of the proposition "banks understand my business" with age of respondents presented in Table D.11 bears this out; those firms perceiving that banks do not understand their business are predominantly in the youngest age categories. These relationships are not statistically significant, however, as indicated by significance values for directional measures presented in Table D.12.

Results explain preferences and patterns of financing reported in earlier sections. Respondents' preference for debt when seeking external finance expressed in Tables 4.1 and 4.2 may be partly explained by firms not perceiving information asymmetries in debt markets. Greater perception of information asymmetries among firms in the youngest age categories is exacerbated by the concentration of 50% of these firms in sectors typified by a high proportion of intangible assets. This finding may also explain the high use of external equity (37% of total financing) by this group reported in Table 2.2, and partly explains the provision of personal assets to secure debt by firm owners in the youngest age category.

A sectoral cross tabulation of the proposition "banks understand my business" presented in Table D.13 reveals that almost 30% of respondents perceiving information asymmetries in debt markets are in the "computer software development and services" sector. This may arise from a relatively young age profile, as over 60% of firms in this sector are under 10 years old. Another relevant factor is the technological nature of the sector, confirming the finding of Hogan and Hutson (2005), that firms in this sector do not perceive information asymmetries in venture capital markets to the same extent that they perceive asymmetries in the bank-client relationship. This may be due to the technical knowledge and specialist skills of venture capitalists in assessing technologically complicated investment projects, and the lack of specialised knowledge by loan assessors in banks.

Almost 90% of respondents believe that "banks are willing to provide overdraft facilities" to their company, as shown in Table 4.5. This result is consistent with empirical evidence highlighting the reliance of SMEs on short-term bank debt (Chittenden et al. 1996), which is even greater in the Irish context (Ayadi 2008). The effect of respondents' perception may perpetuate this reliance, as firms are more likely to apply for additional short-term debt if they perceive their application will be successful. Respondents' perception partly explains patterns of financing reported in Table 2.2, indicating that short-term debt was the second most important source of finance after retained profits, comprising an average 22% of capital structures. This result also supports the contention that financial institutions advance short-term debt facilities more readily, as they usually involve smaller amounts than long-term debt or mortgage finance, and can be recalled at short notice (Esperanca et al. 2003). Additionally, banks may seek to reduce their exposure by advancing debt with a shorter maturity. Respondents' perception may therefore result from a combination of demand-side and supply-side factors.

Respondents' perception of the proclivity of financial institutions to seek collateral as security for debt finance is evident from responses to propositions three and

four presented in Table 4.5. Eighty five per cent of respondents perceive that "providers of debt insist on collateral," and 81% perceive that banks lend to firms with tangible assets, such as cash and fixed assets. Respondents' perceptions may be due to experiences in contracting with financial institutions (results from multivariate models presented in Table 3.10 indicate statistically significant positive relationships between use of short-term, long-term, and total debt, and provision of collateral). Additionally, results from SUR models presented in Table 3.19 indicate statistically significant positive relationships between use of debt and provision of firm assets as collateral for all models, apart from firms in the "other" sector. These results confirm findings of previous studies emphasising the importance of lien-free collateralisable assets in securing debt finance (Heyman et al. 2008). Thus, consistent with Myers (1977), firms whose assets consist primarily of intangibles have most difficulty in accessing bank loans.

Respondents' perceptions highlight a number of issues for SME financing. Firstly, firms without access to adequate collateralisable assets may be discouraged from applying for debt capital on the basis that they believe it will be unsuccessful (Kon and Storey 2003), which may lead to underinvestment. Secondly, these perceptions may result in overreliance on short-term debt (Chittenden et al. 1996), rather than a more appropriate source, such as long-term debt. This may increase the cost of capital for the firm, as short-term debt is generally more expensive than the latter. Additionally, dependence on short-term debt exposes the firm to liquidity problems if the bank restricts or withdraws this facility at short notice. Furthermore, SMEs may be compelled to employ more expensive sources of financing, such as debt factoring, invoice discounting or use of trade credit.

Respondents' perceptions on propositions concerning venture capital funders are also reported in Table 4.5. Venture capital comprises 5% of the capital structures of respondents (as shown in Table 2.2), and this is reflected in responses to questions on venture capital funding. Whilst 34% of respondents agreed with the proposition that "venture capitalists invest in companies with cash/fixed assets," over 50% expressed no opinion and 15% disagreed. This result suggests that respondents are generally inexperienced with, or ambivalent about venture capital finance. Of those firms in disagreement with this statement, over 50% are in sectors typified by a lack of collateralisable assets, namely the "computer software development and services" and "other services" sectors. This finding suggests that respondents in these sectors are more acquainted or experienced in contracting with venture capitalists.

Sixty five per cent of respondents agree with the statement "the availability of venture capital is susceptible to market fluctuations," whilst 32% express no opinion. This result indicates that respondents are aware of fluctuations in venture capital investment activity. One third of those in agreement with this proposition comprise firms in sectors typified by a lack of collateralisable assets, namely the "computer software development and services" and "other services" sectors. Once again, this result suggests that respondents in these sectors are more experienced in contracting with venture capitalists. Whilst respondents appear cognisant of the workings of venture capital markets in general, they do not have strong opinions about proposed statements. This may be explained by the relatively small

percentage of respondents seeking venture capital. Respondents in the "computer software development and services" and "other services" sectors appear to have more definite opinions on venture capitalists.

In summary, respondents' answers to propositions presented in Table 4.5 partially explain motivations behind observed capital structures and stated financing preferences. In general, respondents do not perceive information asymmetries in debt markets. This perception may be partly explained by the age profile of respondents, as reputation effects (Diamond 1989) overcome these asymmetries. Information asymmetries in debt markets may be higher in practice, however, because the views of non-surviving firms are not reported in this survey. The latter firms may have perceived higher asymmetries in debt markets. Respondents perceive a requirement for collateral to secure debt finance, confirming evidence from previous studies detailing financial institutions' proclivity for collateral to overcome potential agency problems of moral hazard (Coco 2000; Heyman et al. 2008). An implication of this perception is that firms lacking adequate collateralisable assets may be reluctant to apply for debt finance. Respondents report that financial institutions are willing to advance short-term debt facilities, which may partly explain reliance on this source as the second most important means of financing. Relatively few firms in the sample employ external equity, which is reflected in the ambivalence of respondents to questions on the requirements of venture capitalists.

4.9 Financial Objectives

The primary objective of the firm manager in publicly quoted firms is maximisation of the value of the firm, which is achieved by maximising the market price of common stock (Smart et al. 2007). Ownership of SMEs is typically closely held, and equity is not publicly traded. The goal of value maximisation is therefore manifested differently in SMEs. Cooley and Edwards (1983) suggest that the objective of "maximising the value of the selling price of the firm" is a suitable proxy for value maximisation in SMEs. This objective is not, however, consistent with maintaining control of the firm, and is more in keeping with the objective of equity holders aiming to harvest their investment.

Respondents were asked to indicate their primary financial objectives from a list compiled with reference to the literature. These objectives are compared with results of previous studies, and are presented in Table 4.6. Results indicate that the primary financial objective of respondents is maximisation of net income, followed by maximisation of sales revenue. Respondents consider maximisation of the potential selling value of the firm as the least important objective. These results suggest that SME owners are more concerned with the immediate, tangible objective of income maximisation rather than the less certain, difficult-to-measure objective of maximising the valuation of the firm. Respondents' stated financial objectives are congruent with the goal of retaining control of the firm and maximising profits, which are the primary source of investment finance. This result is consistent

Table 4.6 Stated financial objectives of respondents

	Mean Score	Top three objectives (%)	Top three objectives (%) (Cooley and Edwards 1983) (n = 97)	Top three objectives (%) (LeCornu et al. 1996) (n = 30)
Maximise potential selling value of the firm (n = 279)	3.35	51	24	3
Maximise net income/profit (n = 282)	1.59	95	79	37
Maximise market share (n = 278)	3.23	52		10
Maximise sales (n = 276)	2.86	71		
Maximise return on equity			47	
Maximise growth in net income			75	10
Maximise after-tax profit margin			49	
Other				33

with the findings of Cooley and Edwards (1983) and LeCornu et al (1996). These studies report that firm owners' primary objective is profit maximisation, which is commensurate with the goal of maintaining control of the firm.

The objective of "maximising market share" and "maximising the potential selling value of the firm" are third, and fourth order financial objectives of respondents respectively. This result confirms the findings of previous studies (Cooley and Edwards 1983; LeCornu et al. 1996), indicating that value maximisation is generally not the primary financial goal of SME owners.

There are significant sectoral differences in pursuit of this objective. Results presented in Table D.15 indicate that 40% of respondents whose primary objective is maximisation of the selling value of the firm are in the "computer software development and services" sector. Over 60% of firms in this sector report value maximisation as their primary or secondary financial objective. This result suggests that owners may be focussed on eventually harvesting their investment through a trade sale, initial public offering of common stock, or otherwise, rather than maintaining control of the firm. Additionally, external equity investors may require a return on their investment in a relatively short time span at the highest possible valuation (Smith and Smith 2004). This result is consistent with the findings of Hogan and Hutson (2005), who report that the goal of "maximising the selling value of the business" is the primary objective of owner-managers of NTBFs. Significance values for directional measures presented in Table D.16 indicate that these relationships are statistically significant, although low values for test statistics indicate that they are weak.

Sectoral differences in financial objectives of respondents are confirmed by analysis of the "profit maximisation" objective presented in Table D.17. Firms whose primary objective is to maximise net income are in the "distribution, retail, hotels, and catering," and manufacturing sectors. Over 80% of firms in all three

sectors report maximising net profits as their primary or secondary financial objective. This result confirms sectoral differences in financing preferences reported earlier, and is consistent with empirical evidence from previous studies (Berggren et al. 2000). These results also partly explain financing patterns observed in the one-way Anova and results of the multivariate analysis, presented in Tables 2.2 and 3.10 respectively. Results presented in Table D.18 suggest that these relationships are statistically significant, although low values for test statistics reveal that they are fairly weak.

4.10 Respondents' Considerations When Raising External Finance

One means of ascertaining explanations for the financing decision is to enquire about primary considerations when raising external finance. Information about firm owners' principal concerns when considering raising external finance partly answers the question "Why do firms have particular financing preferences?," and provides indications why firms may be reluctant to apply for additional debt or equity financing. Moreover, consideration of respondents' primary concerns when raising finance may improve the supply and efficiency of allocation of resources to the SME sector if funders can address these concerns.

Respondents' considerations when raising debt and equity finance are presented in the following two sections. Survey participants were asked to rank these issues in terms of importance, thus revealing why they may or may not employ a particular source of finance. Analysis of these responses provides supplementary evidence for observed capital structures and financing preferences detailed in previous sections.

4.11 Considerations When Raising Debt

In this section, respondents' views on important considerations when raising debt are presented and analysed. A list of factors influencing the "debt decision" was compiled from the literature, and respondents were asked to rank the factors from one to five in order of importance. The first, second, third, and fifth factors, relating to debt-tax shield, cost, signalling, and accumulation of financial slack respectively would promote the use of additional debt, whereas the remaining factors listed are likely to have the opposite effect. Respondents' replies are presented in Table 4.7, and compared with those of an earlier study by Cooley and Edwards (1983).

As evidenced by respondents' perception of the factors listed above, issues relating to the cost of debt and the lack of adequate profits are the two most important considerations when raising debt finance. It is interesting to note that respondents attach primary importance to the cost of debt. This result implies that

Table 4.7 Respondents' views of the most important considerations when raising debt

	Top three considerations (%)	Mean score	Top three considerations (%) (Cooley and Edwards 1983) (n = 97)
Tax deductibility of interest (n = 170)	58	3.25	45
When interest rates are low (n = 211)	80	2.22	
To send a signal to our investors (n = 85)	24	4.6	
Debt limitations placed by lenders (n = 160)	58	3.23	33
Desire for unused borrowing capacity (n = 126)	46	3.84	54
Company restrictions imposed by lender (n = 165)	56	3.39	31
Uncertainty of future sales (n = 174)	65	3.07	63
Recent profits are not enough to fund our activities (n = 183)	78	2.41	
Uncertainty of future profitability (n = 186)	68	2.96	73

respondents willing to access debt finance do so only when they deem that the interest rate is not prohibitively high; suggesting that when the cost of debt is prohibitive, respondents are unwilling to pursue positive NPV projects. This factor may therefore cause firm owners to observe a truncated pecking order of financing, and consequently lead to underinvestment. (Consideration of the cost of debt may not be an issue for firms in financial distress or firms engaged in financial bootstrapping, where the cost of funding is a secondary consideration to the acquisition of funds.)

The second most important consideration when raising debt finance is that "recent profits are not enough to fund activities," as shown in Table 4.7. This result indicates that one of the principal reasons respondents resort to debt finance is when profits are insufficient to fund positive NPV projects. This finding confirms results of the one-way Anova and multivariate analysis presented in Tables 2.2 and 3.10 respectively, and explains respondents' stated preference to fund investment from retained profits in the previous section. This result further emphasises the importance of profitability in financing SMEs, and suggests that respondents finance investment in a manner consistent with the pecking order theory (Myers 1984; Myers and Majluf 1984).

Use of debt when retained earnings are insufficient for investment needs is further emphasised by the following two considerations in importance shown in Table 4.7; "the uncertainty of future profitability," and "the uncertainty of sales." These latter considerations were highlighted as the most important factors influencing the use of debt by Cooley and Edwards (1983). These results reiterate the importance of profitability in funding investment in SMEs revealed in the previous answer, and provide further support for the preference that respondents have to fund investment projects from retained earnings, resorting to debt when this source is inadequate.

Respondents attach relatively less importance to the remaining considerations listed in Table 4.7, which may be classified as trade-off theory, restrictions placed

by lenders, signalling theory, and the desire to accumulate financial slack. Trade-off theory postulates that firms should maximise levels of debt in order to take advantage of debt-tax shields. Respondents rank the "tax deductibility of interest" as joint fifth in order of importance when considering raising debt, as shown in Table 4.7. This result indicates that firms are more concerned with the cost of debt than the potential tax saving benefits it may provide.

Restrictions placed by lenders are also of lesser importance to respondents when thinking about raising debt. "Debt limitations placed by lenders" and "company restrictions imposed by lenders" rank joint fifth and seventh respectively in order of importance, as shown in Table 4.7. This result is consistent with the findings of Cooley and Edwards (1983), and suggests that respondents are more concerned about raising debt than covenants or restrictions imposed by lenders.

The least important considerations reported in Table 4.7 are "desire for unused borrowing capacity" and "to send a signal to our investors." These responses indicate that when considering raising additional debt, firms are primarily concerned with the functional role of debt rather than strategic issues of accumulating financial slack or signalling to investors.

In summary, results indicate that when considering raising debt, respondents are primarily concerned with the cost of debt and insufficient retained earnings. Firm owners demonstrate a preference for financing in a manner consistent with the pecking order theory (Myers 1984; Myers and Majluf 1984), or at least a truncated pecking order, as the preferred source of funding is retained profits followed by debt. This preference is influenced by the cost of debt, suggesting that high interest rates may restrict the use of debt financing. Considerations such as company restrictions imposed by the lender, a desire for unused borrowing capacity, and signalling are of lesser importance. Respondents appear to be concerned with the pragmatic or immediate concern of sourcing the required funding at low interest rates, rather than concerned with what they may consider secondary issues such as limitations, restrictions, and signalling factors.

4.12 Considerations When Raising External Equity

In this section respondents' views on the most important considerations when raising additional external equity are presented and analysed. A listing of principal concerns when raising external equity was compiled from a review of the literature, and respondents' views on these considerations are presented in Table 4.8.

Empirical evidence from previous studies indicates that desire to retain control of the firm and maintain managerial independence is one of the primary goals of SME owners (Chittenden et al. 1996; Berggren et al. 2000). Over 90% of respondents are of the opinion that "loss of control" is an important issue when considering raising equity finance, as shown in Table 4.8. This result supports the finding in a previous section, that over three quarters of respondents wished to "maintain a majority shareholding in the firm for the founder," and is consistent with

Table 4.8 Respondents' primary considerations when raising additional external equity

	Important or moderately important (%)	Mean score	Important factors (Poutziouris 2002) (%)
Loss of control (n = 283)	92.6	1.49	71.6
Loss of management freedom of action (n = 278)	84.9	1.79	63
Pressure to change the management team (n = 280)	61.4	2.39	40.5
Pressure to appoint non-executive directors (n = 278)	33.1	3.07	
Increased burden of monitoring costs (n = 280)	54	2.6	
Search costs (n = 275)	43	2.8	
Financing costs			49.5

conclusions from previous studies (Poutziouris 2002). Whilst this finding may seem tautological, it partly explains observed capital structures and stated financing preferences of respondents. Furthermore, it is consistent with the finding of Baeyens and Manigart (2005), that when sourcing additional funding only a minority of venture backed start-ups source funds from new equity investors. An implication of this result is that, if faced with the choice of employing additional external equity to invest in positive NPV projects, firm owners may eschew growth options in pursuit of the primary goal of maintaining control of the firm.

Responses to the second proposition in Table 4.8 reveal a desire to maintain managerial independence in running the firm. Eighty five per cent of respondents attach importance to the "loss of management freedom of action." This result indicates that firm owners' goal of retaining control is further emphasised by a desire to maintain managerial autonomy and freedom of action. Stated desire for managerial independence explains the relatively low amount of external equity financing as a percentage of respondents' capital structures reported in Table 2.2, and explains the general aversion to external equity expressed in Table 4.1.

Pressure to change the management team is not viewed with equal importance, with 61% of respondents considering it an important issue. This is a surprising view in light of replies to previous statements, as firm owners are ordinarily central to the management team, and are frequently displaced with professional managers ". . .by equity providers exercising control rights" (Smith and Smith 2004, p. 394). Alternatively, this result may be interpreted as firm owners welcoming additions to the management team. This is especially true when considered in conjunction with respondents' attitude to the proposition in the following paragraph regarding appointment of non-executive directors. These results confirm the earlier finding of Poutziouris (2002), although firms in the present study attach a relatively greater importance to factors of control and managerial independence.

Thirty three per cent of respondents attach importance to "the pressure to appoint non-executive directors," the third proposition in Table 4.8. This response indicates that firm owners are amenable to, and possibly welcome, the added expertise and prestige provided by the appointment of non-executive directors. This result

suggests a willingness to remedy a perceived deficiency in management skills reported in Table 4.3. Furthermore, this finding is consistent with evidence indicating that added expertise of external investors is as important as the additional equity they invest (Cressy and Olofsson 1997b; De Bettignies and Brander 2007).

The relatively higher costs of raising external equity are frequently cited as being onerous for SMEs (Ibbotson et al. 2001). This includes not only initial search and ongoing monitoring costs, but also the loss of management time and effort to business affairs. As shown in Table 4.8, 54% of respondents attach importance to the "increased burden of monitoring costs," and 43% attach importance to "search costs." These results suggest that respondents do not rank issues of cost with the same degree of importance as issues of control. This is in direct contrast with respondents' primary concern when thinking about sourcing debt reported in the previous section, where the cost of finance was the primary consideration.

In summary, respondents' primary considerations when thinking about raising external equity are loss of control, and loss of managerial freedom of action. Although it may seem tautological, this result partly explains observed capital structures and respondents' adherence to the pecking order theory. Pressure to change the management team is not viewed with equal importance. Appointment of non-executive directors is not a principal consideration, suggesting that firm owners welcome the added expertise of such appointments. The cost of additional external equity appears to be of secondary importance to the loss of control.

4.13 Exploration of Signalling, Trade-Off, And Timing Theories

The previous two sections considered the question "What are the financing preferences of respondents?" and investigated potential explanations for stated financing preferences. In these sections, as in the preceding two chapters, issues considered derived primarily from pecking order and agency theories. In this section issues related to trade-off, signalling, and timing theories of capital structure are considered by analysing respondents' replies to a number of propositions and statements posed in the form of Likert scales. These statements address a number of strategic objectives when raising finance, including; raising debt to take advantage of debt-tax shields (trade-off theory); timing the raising of finance to take advantage of low interest rates or high equity valuations (timing theory); as a means of signalling to investors (signalling theory); and accumulation of financial slack. A number of questions were posed to survey participants on these strategic issues, and respondents' replies are reported in Tables 4.9, 4.10, and 4.11. As with previous tables, percentage of respondents agreeing with each proposition is reported, along with the mean score. Also included is the percentage of respondents with an indeterminate opinion on each proposition, as the amount in this category is particularly high in a number of instances. The relatively high number of indeterminate answers

contributes to mean scores close to 2.5 on almost every issue, and suggests that respondents do not place primary importance on strategic issues when raising finance. Each strategic issue is now discussed in turn.

4.14 Respondents' Views on Signalling Effects

Respondents' views on the first and second propositions presented in Table 4.9 suggest that signalling information about the value of the firm to external investors or funders is not an important consideration for firms in the SME sector when raising debt or external equity. Whilst 37% and 44% of respondents perceive positive signalling effects of debt and equity respectively, an even greater percentage are ambivalent on the matter in both cases. This confirms the view of respondents reported in Table 4.7, that sending a signal to investors was the least important consideration when raising debt. This result highlights differences in interaction with financial markets by SMEs and Publicly Listed Companies (PLCs). Whereas financial markets may react positively to a publicly quoted company issuing debt on the basis that it is a signal of the quality of an investment project, financial institutions, creditors, and customers may react negatively to an SME raising additional debt, because of the additional business risk it entails. Similarly, it is considerably more difficult for SMEs issuing equity to convey a signal to financial markets because of increased information asymmetries in private equity markets.

Forty-four per cent of respondents perceive positive signalling effects in the appointment of non-executive directors, although almost the same percentage are ambivalent on the matter. This finding is possibly symptomatic of the use of external equity by a small number of firms, and suggests that whilst firms may be amenable to the appointment of external non-executive directors (as indicated in Table 4.8), they are unconvinced of the signalling effects of such an appointment. These results suggest that the primary concern of SMEs is raising the means of financing required, rather than conveying a signal to the financial markets.

Table 4.9 Respondents' views on the signalling implications of financing

	Strongly agree or agree (%)	Neither agree nor disagree (%)	Mean score
Raising debt provides a favourable signal to investors, lenders, creditors and customers about the firm's future prospects (n = 282)	37	46	2.8
Raising external equity sends a favourable signal to lenders, investors, creditors and customers about the firm's future prospects (n = 282)	44	47	2.6
Appointing a non-executive director sends a favourable signal to lenders, investors, creditors, and customers about the firm's prospects (n = 282)	44	42	2.6

4.15 Respondents' Views on Debt-Tax Shield Benefits of Debt

Theoretical and empirical studies indicate that use of debt finance may confer a number of cost benefits. Firstly, the trade-off theory proposes that firms employ debt to take advantage of the debt-tax shield, thereby shielding profits from corporation tax. Secondly, raising debt finance is generally cheaper than employing external equity, as interest rates are typically lower than average rates of return earned by providers of external equity, *ceteris paribus*.

Respondents' views on taxation and cost benefits of employing debt finance are presented in Table 4.10. Forty per cent "consider differences in the tax treatment of retained earnings, interest, and capital gains for shareholders," whilst a greater percentage (52%) are ambivalent on this proposition. This view confirms respondents' consideration of the relative unimportance of tax advantages when raising debt finance presented in Table 4.7, where it ranked joint fifth out of nine considerations when raising debt. Considered collectively, these answers indicate the relative unimportance of tax advantages of debt to the financing decision of respondents. This finding is consistent with the empirical evidence of Michaelas et al. (1999) and Sogorb Mira (2005), who do not find a statistically significant positive relationship between leverage and the marginal tax rate. Furthermore, the relatively low Irish corporation tax rate of 12.5% means that strategic use of debt to lower interest payments may not be a primary concern for Irish SMEs. Firm owners may thus consider interest shield benefits of taxation greatly outweighed by the added business risk of additional debt. This evidence suggests that use of debt is not governed by consideration of the tax benefits that debt confers.

The relatively lower cost of debt compared with equity may promote use of debt or induce the firm owner to substitute relatively more expensive equity with less costly debt in the capital structure. As shown in Table 4.10, 26% of respondents agree that "debt is used as a strategic tool to lower financing costs," whilst the same percentage disagrees with this statement. Almost 50% of respondents are ambivalent on this matter, suggesting that firm owners do not consider employing debt finance primarily as a strategic tool for the purpose of lowering financing costs.

Considered together, these answers indicate that respondents do not employ debt finance to obtain potential benefits of tax shields, or a relatively lower cost of financing. Analysed in conjunction with previous evidence, these results suggest that firm owners are more concerned with employing sources of finance compatible

Table 4.10 Respondents' views on the tax and cost benefits of debt

	Strongly agree or agree (%)	Neither agree nor disagree (%)	Mean score
I consider the differences in tax treatment of retained earnings, interest and capital gains for shareholders (n = 278)	40	52	2.6
Debt is used as a strategic tool to help lower financing costs (n = 283)	26	48	3

with maintaining control of the firm, rather than maximising use of debt for potential subsidiary benefits it may confer.

4.16 Respondents' Views on Timing Considerations

Firms may take advantage of periods of high equity valuations (Baker and Wurgler 2002) or low interest rates to build up financial slack, which can be retained for positive NPV projects, or in the event of adverse trading conditions. The accumulation of financial slack may be especially important for SMEs, as they are restricted in terms of access to capital markets and the amounts they can raise. This becomes especially true during an economic downturn or recession, as SMEs may be more vulnerable to a "credit squeeze" than larger companies. Respondents' views on timing considerations when raising finance are presented in Table 4.11.

Fifty one per cent of respondents agreed with the proposition "Issue debt when interest rates are low, issue stock when prices are high, to finance capital investment projects", suggesting that respondents take account of market conditions when considering raising debt. Nonetheless, it is not possible to definitively conclude that respondents' financing choice is influenced by timing considerations because of a relatively high number of indeterminate responses. There may at least be some element of timing involved in raising finance, however. Recall that respondents indicated that "when interest rates are low" was the most important consideration when considering raising debt, as documented in Table 4.7. These answers suggest that the level of interest rates at the time of sourcing debt finance may affect the financing decision, in that prohibitively high interest rates may preclude the firm owner from raising debt. The effect of these views is that firm owners may be deterred from raising finance for positive NPV projects, resulting in underinvestment.

Respondents' views on accumulating financial slack are revealed in answers to the proposition "Issue debt when interest rates are low, issue stock when prices are high, even though present needs are not great in order to build up a long-term funds 'cushion'," reported in Table 4.11. Sixteen per cent of respondents agree with the proposition, 64% are ambivalent and the remainder disagree. This finding confirms

Table 4.11 Respondents' views on timing considerations of the financing decision

	Strongly agree or agree (%)	Neither agree nor disagree (%)	Mean score
Issue debt when interest rates are low, issue stock when prices are high, to finance capital investment projects (n = 280)	51	45	2.5
Issue debt when interest rates are low, issue stock when prices are high, even though present needs are not great in order to build up a long-term funds "cushion" (n = 280)	16	64	3

the opinion expressed in Table 4.7, in which respondents indicate that "desire for unused borrowing capacity" is the second-least important consideration of nine when considering raising debt. Considered collectively, these answers indicate that accumulation of financial slack is not an important consideration for respondents.

In summary, theories developed in corporate finance based on signalling, debt-tax shields, timing considerations, and accumulation of financial slack are generally not of primary importance for respondents when making the financing decision. There may be a number of reasons for this. Firstly, these theories are not as relevant for SMEs as they are for PLCs because of fundamental differences in ownership and managerial structures of the firm. Secondly, SMEs have significantly different interactions with capital markets than PLCs. Thirdly, objectives and motivations of SME owners and managers of PLCs are not directly comparable, resulting in very different strategic objectives, especially with respect to financing.

Results suggest that respondents are more concerned with practical matters when raising additional external finance, rather than what they may consider to be ancillary strategic issues. Respondents do not employ strategies suggested by corporate finance theories when making financing choices. Results indicate that SMEs operate within a different environment, and with different objectives. In general, they are profit maximisers intent on maintaining control of their firms, as opposed to large corporates whose goal is to maximise shareholder value.

4.17 Conclusion

In this chapter, agency and pecking order theories of capital structure are further explored by consideration of evidence in the form of respondents' replies to direct questions, and statements proposed in the form of Likert scales. A number of interrelated questions are asked in addressing two primary issues; "What are the financing preferences of respondents?," and "Why do respondents maintain these preferences?" Replies to these questions facilitate examination of the relevance of theoretical propositions in explaining respondents' capital structures, and stated financing preferences.

Respondents' preferred source of financing is retained profits. Almost 50% indicate a willingness to employ long-term debt finance when required. Eighty per cent of respondents indicate an aversion to raising additional external equity. These preferences are consistent with propositions of the pecking order theory (Myers 1984; Myers and Majluf 1984), although the expressed aversion to external equity suggests that the majority of respondents may adhere to a truncated pecking order. Investigation of the perceived greatest internal growth constraints and primary considerations when raising debt emphasise the importance of profitability in financing investment, and suggest that adherence to a preferred pecking order is contingent on the profitability of the firm.

Explanations for stated financing preferences of respondents are threefold. The primary reason is desire to retain control of the firm and maintain managerial

independence, which is stronger in closely held private limited firms than in firms with wider ownership. Secondly, the main financial objectives of respondents are to maximise profits and sales, which reaffirms financing preferences and emphasises respondents' primary goal of maintaining control of the firm. There are sectoral differences in pursuit of this objective; firms in the "computer software development and services" sector are twice as willing to relinquish control as firms in all other sectors, and they consider maximisation of the value of the firm as their primary financial objective. Thirdly, respondents generally do not perceive information asymmetries in debt markets, and believe that financial institutions are willing to provide short-term debt facilities. This is not an unexpected finding given the age profile of respondents, suggesting that information asymmetries are alleviated by reputation effects (Diamond 1989). The majority of firms perceiving information asymmetries in debt markets are in the "computer software development and services" and "other services" sectors. This may be due to a combination of the age profile and technological characteristics of firms in this sector.

Respondents highlighted a number of issues they consider most important when raising external finance that partly explain stated financing preferences and indicate the conditions under which they would consider raising additional finance. By taking these factors into account, funders can improve the efficiency of supply of funds to the sector. Respondents' primary concern when raising debt is the cost of finance, highlighting the influence of supply-side factors in the financing decision. An implication of this belief is that firm owners may avoid raising debt in times of high interest rates, resulting in underinvestment. As respondents also express an aversion to external equity, firm growth will be limited to the return on investment of retained profits, leading to lower growth rates. Additionally, as respondents do not believe in accumulating financial slack they may encounter financing problems during an economic recession, particularly if there is a credit squeeze.

Another belief held by respondents is the requirement for collateral to secure debt finance. Respondents in sectors in which asset structures are typified by a high proportion of tangible assets are more likely to apply for debt finance, and are more confident in securing the finance required than respondents in sectors with asset structures typified by a high proportion of intangible assets. The practice of financial institutions in providing debt finance based on collateral rather than profitability is inefficient, and may have a number of adverse consequences for SMEs. Firstly, perception of a lack of sufficient collateralisable assets may result in a reduction of applications for long-term debt finance, leading to underinvestment. Secondly, this belief may result in over-reliance on other sources of finance which are less appropriate and more costly, such as short-term debt, for example. Investigation of respondents' views on signalling, debt tax shields, timing considerations, and the accumulation of financial slack indicate that these issues are not primary concerns when making the financing decision. Respondents appear more concerned with the issue of raising adequate capital to finance their firm than what they may consider ancillary issues.

Respondents' financing preferences and business motivations are clearly elucidated in an account of a funding application by a builder, Mick Wallace, who had

bought a site on Ormond Quay in Dublin city and was looking for finance for development:

> "I had my cap in hand begging the banks for money," he says. "It took me 18 months to get a bank to finance this and five refused me. I expected the Allied Irish Bank (AIB) to finance it because I had a great relationship with them in Wexford for 15 years. They said they would consider giving me the money under three conditions, one being that I let AIB appoint a bigger builder and that the bank would supervise the whole project financially and that I would pay for their supervisor. I told them that I would rather raise goats on that land before I let someone else build it."
> (O' Connor 2005, p. 44).

This salutary tale characterises the search for finance of many SME owners, who relate difficulties in accessing finance, notwithstanding lengthy relationships with financial institutions. Above all else, however, it exemplifies the fundamental desire of the firm owner to retain control of the NPV project, even to the extent of non realisation of the venture.

Chapter 5
Discussion and Conclusions

Financial constraints vary with stages of development and firms believe that it recedes as firms grow successfully through the stages of development. Some firms do not want to seek external finance, mainly in order to keep the business simple and have control

(Ullah and Taylor, 2005, p. 259)

5.1 Introduction

Notwithstanding the importance of SMEs to national economies in terms of employment, gross value added at factor cost, and numbers of enterprises, academic research on capital structure choice of firms in the sector is in its infancy. A belated interest in the subject has resulted in a burgeoning body of work. This literature first emerged from the US and the UK, although it now covers a wider geographic spread. Despite a proliferation of studies, there are a number of gaps in the literature, particularly a dearth of studies in the Irish context. A common theme in published papers considers the supply of funding to the sector, especially investigations of a so-called "funding gap". Although capital structure is a function of both supply-side and demand-side factors, studies on the latter are comparably fewer. This study addresses these gaps in the literature.

This book investigates capital structure determinants of SMEs employing financing data from a sample of Irish firms. This subject is examined by considering a number of related issues, detailed in three questions; (a) Do sources of finance employed by SMEs change across age profiles?; (b) Are sources of finance employed by SMEs determined by firm characteristics?; and (c) What are firm owners' goals and preferences when considering the financing decision?. These research questions are addressed by analysing results of a combination of statistical tests on firm financing data, and by considering replies to questions and statements posed in the form of Likert scales on a questionnaire survey.

This study has both descriptive and analytical aspects. Firm resourcing is considered over a financial growth life cycle, and analysed in a number of ways:

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Contributions to Management Science,
DOI 10.1007/978-3-7908-2399-8_5, © Springer-Verlag Berlin Heidelberg 2010

firstly, capital structures and collateral provision are analysed across a number of age groups employing a one-way Anova. Secondly, financial and collateral resources at start-up are compared with those employed presently. This approach takes account of the changing nature of resource requirements and acquisition as the firm matures and develops, and attempts to capture the varying, irregular nature of financing across a firm's life cycle. Additional statistical analysis is conducted in investigating the influence of firm characteristics on firm financing, and exploring inter-industry variation in capital structures. The latter is done employing Zellner's (1962) SUR model. Finally, SME owners' stated preferences, objectives and business goals are described and analysed in seeking a more holistic explanation for SME financing choice.

This chapter collates findings of various statistical tests employed in the study, evaluating theoretical implications, as well as outlining suggestions for policy and future research. In the following section, results are considered collectively, and each theoretical approach investigated is discussed in turn. In subsequent sections, implications for future research, policy, and practitioners are outlined. The final section assesses results in relation to initial research questions posed.

5.2 Discussion of Results

The main findings of this research project may be grouped according to the capital structure theory examined. This section collates and summarises results presented throughout the book by considering each theory in succession. This synopsis evaluates findings relative to theoretical propositions, as well as indicating implications for financing firms in the sector.

5.3 Asymmetric Information and Signalling Theories

Combined results of bivariate and multivariate statistical tests on respondents' financing data suggest that firms generally source investment finance in a manner consistent with the pecking order theory, i.e. a preference for, first internal funds (personal savings of the firm owner and retained profits); second, short-term borrowings; third, longer term debt; and, least preferred of all, equity from new investors (Myers 1984; Myers and Majluf 1984). Observed capital structures are in accordance with respondents' stated financing preference, which is to employ internal equity as the primary source of investment finance. Adherence to a preferred pecking order is dependent on sources of financing available, and thus varies over the life cycle of the firm. Internal equity, which becomes the primary source of financing over time, is sourced from retained profits and personal funds of the firm owner and funds from "f" connections. Reliance on the latter source decreases over time as firms increasingly employ retained profits. Adherence to the pecking order theory is thus primarily determined by profitability, and secondly by rates of

reinvestment. These factors, in turn, influence the amount of financing employed from external sources.

Consistent with the pecking order theory, short-term debt is the second-most important source of funding for respondents. This pattern of financing is in accordance with a declared desire to retain control of the firm and maintain managerial independence. Thus, consistent with the central proposition of the pecking order theory, firms employ sources of finance presenting minimal intrusion into the business, and least subject to adverse consequences of information asymmetries. A stated willingness to employ long-term debt to finance investment projects provides further evidence of a preference for debt when retained profits are insufficient for investment needs. Furthermore, the majority of respondents express a desire to employ external equity as a source of "last resort". This preference is consistent with the pecking order theory, although reluctance to employ external equity indicates that the pecking order may be truncated at the point of debt. An implication of truncation is that sources of financing are confined to retained profits and debt, potentially leading to underinvestment. Observed capital structures are consistent with stated preferences, suggesting that firms generally adhere to a desired pecking order.

Reasons proffered by respondents for adherence to the pecking order theory are threefold. Firstly, they express a desire to maintain managerial independence and retain control of the firm. Secondly, respondents do not perceive information asymmetries in debt markets. This is not an unexpected finding, as the age profile of the sample suggests that reputation effects partly alleviate problems of information opacity. Thirdly, respondents' financial objectives are consistent with maximising profits and sales rather than "value maximisation", which emphasises the primary stated goal of retaining control of the firm.

Similar to empirical evidence from previous studies, external equity is employed by a small number of firms. This source is utilised primarily by young firms typified by low levels of collateralisable assets and a high level of R&D activity relative to turnover. Whilst this profile suggests that use of external equity may be the result of supply-side constraints, evidence indicates that it can be attributed to respondents' preferences. Firms preferring to employ external equity over debt perceive asymmetries in debt markets, and declare a desire to "maximise the value of the firm", which is consistent with the goal of harvesting investment. Thus, consistent with evidence from previous studies, firms may adhere to a modified version of the pecking order theory because of differences in firm owners' motivations and objectives.

An alternative capital structure theory propounds that firms overcome information asymmetries by signalling to financial markets through the issuance of debt or equity (Ross 1977). Results indicate that signalling is not an important factor for respondents when considering raising debt or equity finance. Signalling was reported as the least important consideration when raising debt, as interest rates and profitability were first and second order concerns respectively. The primary reason signalling theory does not apply to the SME sector is the dissimilar nature of financial markets accessed by firms, as signalling is more difficult when operating

in private markets than in public markets. Additionally, theorised signalling mechanisms may be reversed in acquisition of funding by SMEs, as raising additional debt may be considered by funders as a negative rather than a positive signal because of added business risk.

Although provision of personal assets of the firm owner may be interpreted as having a signalling function, as proposed by Bester (1985) and Besanko and Thakor (1987), respondents' views are consistent with the proposition of Coco (2000) and Manove et al. (2001), i.e. that collateral is used by financial institutions to protect against credit exposure, rather than as a signalling mechanism. Results suggest that SMEs are more concerned with pragmatic issues of securing finance at the lowest cost and least amount of intrusion into the firm, than what they may consider as extraneous issues such as signalling.

In conclusion, firms generally source finance in a manner consistent with the pecking order theory. Sources of finance employed are those that represent minimal intrusion into the business, and thus firms may operate under a truncated pecking order. A small number of firms appear to operate under a modified pecking order, with firms in the "computer software development and services" sector indicating a willingness to employ external equity before debt.

5.4 Agency Theory

Results of bivariate and multivariate statistical tests indicate that firm characteristics, along with owners' motivations and preferences, determine capital structures of SMEs by their ability to satisfy principals' requirements in techniques employed to overcome potential agency costs. A review of empirical evidence highlighted two techniques commonly employed by financial institutions in seeking to reduce potential agency related costs of moral hazard when advancing debt, namely the "soft" technique of relationship lending, and the "hard" technique of collateral based lending.

Increasing amounts of short-term debt finance employed by firms progressing from nascent and start-up stages suggests use of the "soft" technique of relationship lending, as reputation effects overcome information asymmetries and result in greater access to debt. Furthermore, firms perceiving that banks are unwilling to advance short-term debt facilities, and that banks "do not understand their businesses" are primarily in the youngest age categories. Whilst these perceptions are partly attributable to sectoral differences in asset structures, an implication of these results is that very young firms may experience a "debt gap" due to lack of a trading history. They may thus have to fulfil requirements of other lending techniques employed by financial institutions to reduce potential agency costs, such as provision of collateral. Results indicate that owners of young firms with inadequate collateralisable assets assume additional personal risk by providing personal assets as collateral for firm loans to compensate for lack of a track record. Debt secured on personal assets of the firm owner is most prevalent among firms with low turnover,

and among owners who also invest personal funds in the firm. This result emphasises the interconnection between business and personal risks, and highlights the reduced financing options of firms without access to collateralisable assets.

Multivariate results confirm use of the "hard" technique of collateral based lending by financial institutions when advancing both short-term and long-term debt. Bivariate results indicate that the source of assets provided as collateral to secure short-term and long-term debt varies according to a firm's age. Early stage and nascent firms have a greater reliance on personal assets of the firm owner and assets of "other guarantors" to secure firm debt, whilst older firms have a greater reliance on firm assets. The latter result may be partly attributable to the presence of firms typified by low levels of tangible assets in the youngest age categories. Patterns in use of long-term debt suggest evidence of maturity matching, as long-term debt is secured on fixed assets of the firm.

An investigation of sectoral differences indicates that collateral to secure debt is a universal requirement across all sectors, which is consistent with the finding of Cressy and Toivanen (2001), that provision of collateral is independent of risk type. One notable sectoral difference is that firms typified by high levels of tangible collateralisable assets finance R&D expenditure with debt, whilst firms in sectors typified by intangible assets finance R&D expenditure with external equity.

These results have a number of implications for the financing of SMEs. Firstly, use of asset-based lending techniques as a method of providing debt finance may result in inefficient allocation of resources, as finance is advanced on the basis of collateral rather than profitability. A further negative impact on credit-market efficiency is that an unrestricted reliance on collateral ". . .reduces a bank's incentive to evaluate the profitability of a firm's investment project" (Manove et al. 2001, p. 727). Secondly, this method may result in firm owners with a debt requirement undertaking additional levels of personal risk, as they provide personal assets to secure business debt. A consequence of the provision of personal collateral is that owners of incorporated firms are negating their limited liability. Thirdly, use of asset based lending techniques to allocate debt finance is more onerous on young firms lacking adequate tangible assets as collateral. Thus, firms with a particular profile – young, high-technology firms, for example – are at a relative disadvantage when seeking to raise debt finance. This latter effect may be exacerbated for SMEs seeking to raise debt finance because of proposals of Basel II, which some authors expect will impose greater collateral requirements on "riskier" small firms, making it even more difficult for them to raise debt finance (Tanaka 2003).

A consequence of employing asset-based lending techniques is that respondents in sectors typified by a high proportion of tangible assets are more likely to apply for debt finance, and are more confident in securing the finance required, than respondents in sectors typified by a high proportion of intangible assets. This perception may result from previous experience of raising external funding, and reflects the prevalent use of collateral-based lending techniques by financial institutions. Consistent with the theory of "discouraged borrowers" (Kon and Storey 2003), a potentially adverse consequence of this perception is that firms lacking adequate collateralisable assets may be reluctant to apply for long-term debt

finance. This may result in underinvestment, or in the use of a less optimal source of financing, such as short-term debt, for example. The latter proposition is supported by respondents' perception that banks are willing to advance overdraft facilities.

5.5 Trade-Off Theory

Applicability of the trade-off theory in explaining observed capital structures is investigated by posing direct questions and statements in the form of Likert scales. Respondents state that the debt tax shield is not an important consideration when deciding to raise debt finance. Inadequate profits and levels of interest rates are the most important considerations when raising debt. Bivariate and multivariate results indicate that, rather than being positively related as propounded by trade-off theory, retained profits and debt are negatively related. Thus, consistent with the pecking order theory, debt is employed when retained profits are inadequate for investment. A possible explanation for this result is the comparatively low Irish corporate tax rate of 12.5%. Therefore, the potential value of a debt tax shield may not be justifiable in terms of increased business risk in assuming additional debt. Consistent with evidence from previous studies (Michaelas et al. 1999; Sogorb Mira 2005), respondents appear to be more concerned with potentially negative effects of debt rather than the advantages it confers in terms of a tax shield.

5.6 Implications for Future Research

The paucity of empirical studies considering the financial growth life cycle approach when investigating determinants of financing could be addressed in future research by extending the methods of data collection and analysis employed in this study. Analysing longitudinal data from large samples would facilitate a proportionate representation of firms across all age sectors. This approach has the potential to produce accurate results at an increased number of points in a firm's life cycle, and perform analysis of changes in capital structures of the same firms at various stages of development. This approach facilitates development of more sophisticated financial growth life cycle models by considering sectoral differences in asset structure, growth rates, and temporal capital requirements. Employing longitudinal data reduces difficulties with recall and survivorship bias, and facilitates examination of capital structures of non-surviving firms, including modelling of how different financing decisions might improve survival rates. Inclusion of macroeconomic data such as interest rates and changes in GDP would facilitate investigation of capital structures under different economic conditions.

Use of questionnaire surveys and interviews to collect data at regular intervals would provide future researchers with contextual and explanatory information, and facilitate investigation of more holistic explanations for SME financing.

Considering the relatively favourable response rate to sensitive financing questions posed on the questionnaire instrument in this study, future researchers might profitably seek sensitive data in percentage rather than absolute form. This technique offers considerable advantages to researchers seeking to collect financial data where no published source exists, and will become increasingly beneficial as the EU Administrative Burdens Exercise is likely to reduce the availability of published accounting data in countries where such information is presently readily available. Furthermore, employing questionnaire and interview data collection methods facilitates examination of issues such as the process of raising finance and how it is influenced by factors such as past experience with financiers, pledging of personal guarantees to secure debt finance, percentage of the firm owner's wealth invested in the firm, issues of succession in family firms, and a number of other potentially important factors. This approach also enables a more in-depth examination of how incremental financing decisions of SME owners change through successive developmental stages of the firm. In light of dependence of a number of firms on personal sources of equity of the firm owner, along with provision of personal assets as collateral to secure business loans, future studies may benefit from integrating a personal risk measure for SME owners into models.

5.7 Policy Implications

Public policy focussed on the development of a strong, sustainable SME sector should concentrate on encouraging increased investment by focussing on the sources of finance preferred by firm owners. Results indicate that SMEs source finance for investment in a manner broadly consistent with the pecking order theory (Myers 1984; Myers and Majluf 1984). Previous studies proposed that the aim of increasing investment in SMEs could be achieved by fiscal policies incentivising reinvestment of earnings through providing tax incentives for a percentage of profits retained in the firm (Chittenden et al. 1998; Michaelas et al. 1999), although some studies cast doubt on the effectiveness of tax-reduction policies on investment levels (Hubbard 1997). The potential reduction in taxation burden of SMEs under this proposal is of greater benefit in countries with high rates of corporate tax. Effectiveness of such a policy in Ireland is reduced because of the relatively low corporate tax rate of 12.5%. Possibly of more relevance in the Irish context is the disproportionate level of incentives for diverse investment options; for example, the greater concentration of public resources in providing tax incentives for property investment compared with a lack of similar incentives for investing in the small business sector. Reconsideration of public policy to provide greater incentives for investing in SMEs would provide a "more level playing field" for investment, and would raise levels of productive capital. Similarly, SME owners currently have a greater tax incentive to extract retained earnings from the firm and invest in a personal pension plan than to reinvest them in the business. Public policy aimed at developing and expanding capacity of the SME sector should consider making it

more attractive for SME owners to reinvest retained profits than to extract them from the firm.

One means of extending an incentive to firm owners to invest personal equity in the firm would be to expand the Business Expansion Scheme (BES), which typically entices cash-rich investors to invest in firms with a particular profile, and in doing so, take advantage of personal tax allowances. Expanding the tax incentive to include investment of personal equity of the firm owner would particularly benefit firms with low turnover, as results from this study indicate that these firms are most reliant on personal equity of the SME owner. This is an appropriate juncture for the government to consider these incentives, as a number of studies (Tanaka 2003; Ayadi 2008) contend that smaller, riskier firms may have greater difficulty sourcing debt finance because of more stringent capital adequacy requirements for banks under the Basel II proposals. One consequence of these proposals may result in increased provision of personal assets of the firm owner as collateral for business loans, including the family home. This practice negates limited liability status of incorporated firms and can cause considerable personal loss and distress to the firm owner and his family. Public policy initiatives should be designed to safeguard the home of the SME owner and reduce adverse social effects in event of default on a business loan. It is important, however, in consideration of such a policy not to advance loans in excess of socially productive levels (De Meza and Webb 2000). Additionally, financial institutions should consider reducing their dependency on asset-based lending techniques, concentrating instead on techniques such as financial statement lending. This, in turn, would reduce information asymmetries by obliging SMEs to provide detailed financial accounting information conforming to internationally accepted accounting principles. It would also enable financial institutions to take a more active monitoring role, and improve the effectiveness of credit exposure management.

Results indicate that one of the most important demand-side issues related to financing the sector is a perceived lack of management skills. Public policy focussing on providing financial assistance to SMEs should therefore consider not only provision of financial supports, but also design and delivery of financial management skills training to key employees of firms. Policy makers should consider providing support to existing firms on an ongoing basis, rather than concentrating solely on providing assistance to start-ups. Provision of treasury management programmes may be enhanced by assigning mentors to firms with little experience of raising, managing, and investing capital. Furthermore, management training courses may be offered in partnership with funders, which would have the additional benefit of informing potential applicants for external funding of supply-side requirements and expectations, thus potentially enhancing future funding applications.

Whilst public equity support programmes are targeted at firms with a certain profile, provision of capital continues to produce deadweight and displacement effects (Lenihan 2002). Greater assessment of client companies is needed by government support agencies in administering venture capital and grant support

in order to avoid deadweight effects and distortion of the market by uneven interventions.

5.8 Implications for SME Firm Owners

Findings emanating from this study suggest a number of ways in which firm owners may improve their search for, and acquisition of, external finance. Firstly, a self-perceived lack of management skills may be rectified by completing a financial management course or by seeking additional external professional financial management advice and expertise. Secondly, in seeking external sources of finance firms should perhaps broaden their search to sources heretofore not used or considered. Consideration of previously unused sources of debt or external equity may yield the required investment finance at a lower cost. Thirdly, firms experiencing difficulty raising debt finance because of a lack of a trading history or inadequate collateral should consider employing an organisation or individual in their network, such as an accountant or a legal firm, as an intermediary to approach the financial institution on their behalf. Employing a third party when seeking external finance reduces perceived information asymmetries, and facilitates raising investment capital, and may be particularly beneficial for start-up and nascent firms.

5.9 Implications for Funders

A salient finding of this study is the prevalence in use of asset-based lending techniques by financial institutions when advancing debt. This approach may lead to the inefficient allocation of resources as debt is advanced on the basis of collateral rather than profitability. This method of lending may result in underinvestment, as well as reduced returns for financial institutions. This effect is further exacerbated by the reluctance of some firms to apply for debt finance because of a perception that they will be refused because of inadequate collateral. Some authors suggest that the introduction of stricter capital adequacy laws under the Basel II proposals will promote the use of asset-based lending techniques even further (Tanaka 2003), as banks seek to protect their loans by demanding higher collateral requirements from smaller, riskier firms. A related problem for funders advancing debt finance secured by collateral is that the value of collateralised assets does not remain constant over time. Thus, in times of falling asset prices the residual value of the loan may not be fully covered by the collateral provided. This is a shortcoming of the asset-based lending method, and indicates the impact of cyclical effects on collateral value. As evidenced by recent turmoil in financial institutions, the problem of falling values of collateralised assets can have severe adverse effects on banks' balance sheets in the event of lenders defaulting, and in extreme cases require banks to seek additional funding due to being undercapitalised.

Results indicate that the most important factor for firms when considering raising debt is the level of interest rates. Whilst higher interest rates on loans to the SME sector may reflect the increased cost of monitoring and assessment (Storey 1994), they may discourage firm owners from investing in viable positive NPV projects, resulting in underinvestment and reduced returns to financial institutions. Costs of adverse selection are thus borne by funders as well as by firms in the sector. Additionally, financial institutions should consider the adverse effects of punitive interest rates on long-term lending relationships.

5.10 Findings in Relation to Initial Research Objectives

This chapter concludes by presenting a brief synopsis of results in relation to specific research questions posed at the outset. This book investigates capital structure determinants of SMEs by addressing three questions; (a) Do sources of finance employed by SMEs change across age profiles?, (b) Are sources of finance employed by SMEs determined by firm characteristics?, and (c) What are firm owners' goals and preferences when considering the financing decision?. These questions are addressed by empirically investigating propositions of capital structure theory, employing a combination of quantitative and qualitative evidence. Each question is now reviewed in turn in summarising salient results of the study.

5.11 Firm Characteristics

Combined results from bivariate and multivariate analyses suggest that sources of finance employed by SMEs are partly determined by firm characteristics. Age, size, ownership structure, expenditure on R&D, and provision of collateral are significant determinants of capital structures of SMEs. Analysis of variation in direction and magnitude of regression coefficients across sectors provides tentative evidence that the influence of a number of firm characteristic determinants such as age, size, and ownership structure are similar across sectors. Although a general lack of statistical significance precludes generalization of these findings, they indicate that a number of important issues are relevant in sourcing investment finance for all SMEs, irrespective of sector. This evidence is consistent with the assertion of Balakrishnan and Fox (1993), that firm specific risk factors are a more important determinant of capital structure than sectoral factors. The common underlying factor in accessing debt finance is alleviation of information asymmetries, which is relatively easier for firms with a high level of lien-free fixed assets, *ceteris paribus*. In cases where there are insufficient firm assets to secure business loans, personal assets of the firm owner are an important source of collateral. Debt secured on personal assets of the firm owner is most prevalent among firms with low turnover, and among owners who also invest personal funds in the firm.

Firms with a relatively higher expenditure on R&D employ higher levels of external equity and lower levels of internal equity. This result suggests that high growth firms typically do not have sufficient internal finance to meet their investment needs, and confirms the finding of Cressy and Olofsson (1997b), that owners of firms seeking to grow are less averse to ceding control than those not seeking growth. Ownership structure is also negatively related to external equity and positively related to internal equity, confirming the well documented desire for independence and control in closely held firms.

5.12 Owner Preferences

With regard to the second research question posed, results suggest that financing preferences and objectives of firm owners influence sources of finance employed. Respondents express a preference to fund investment projects primarily with retained profits. Almost half indicated a willingness to employ long-term debt finance when required. Four-fifths of respondents revealed an aversion to raising additional external equity. These preferences are consistent with the pecking order theory (Myers 1984; Myers and Majluf 1984), although the expressed aversion to external equity suggests that the majority of respondents may adhere to a truncated pecking order.

Financing preferences of respondents thus reflect an express desire to retain control of the firm and maintain managerial independence, which is stronger in closely-held private limited companies than in companies with wider ownership. Additionally, the main financial objectives of respondents are to maximise profits and sales. Furthermore, respondents generally do not perceive information asymmetries in debt markets, and believe that financial institutions are readily prepared to advance short-term debt facilities. Respondents do not appear to employ strategic financing objectives as proposed by signalling, trade-off, and timing theories. They appear to operate within a different environment and with different objectives. In general, they are profit maximisers intent on maintaining control of their firms, as opposed to large corporates whose goal is to maximise shareholder value.

5.13 The Financial Growth Life Cycle Model

Results from bivariate and multivariate analyses suggest that the answer to the third research question posed is in the affirmative. Capital structures of respondents appear to follow a financial growth life cycle over age profiles consistent with propositions of agency and pecking order theories. Importance of firm owners' personal contribution to capitalisation of the firm in nascent stages is emphasised; firstly by proportion of funds from personal savings contributed as a percentage of total funding, and secondly by the relatively high level of debt which is secured on

personal assets of the firm owner. Internal equity becomes the most important source of financing over time, as firms increasingly employ accumulated retained profits for investment needs. This is augmented by short-term debt, to which firms gain increased access because of reputation effects of generating a trading history. Increasing dependence on these two sources reduces reliance on personal sources of funding of the firm owner over time. Venture capitalists, business angels, private investors, and government grants provide equity financing to a small number of respondents in targeted sectors. These small amounts of external equity are most important for firms in the youngest age groups. These firms also have a relatively high reliance on debt, which is secured on collateral provided by external guarantors and the personal assets of the firm owner. Consistent with maturity matching, use of long-term debt follows an approximate convex pattern over age categories, indicating an increasing reliance on internal equity as debt is retired over time.

In conclusion, results indicate that sources of finance employed by SMEs are partly determined by firm characteristics and owner preferences, and the proportion of funding from each source changes across age profiles. Firms' financing options generally increase over time as a trading history is established, resulting in a dissipation of potential problems related to information opacity. Although firms generally gain access to increased amounts of financing from a greater diversity of sources as they develop and mature, start-up and nascent firms source finance from a greater variety of sources than older firms. These findings reflect the well documented difficulties faced by start-ups in sourcing adequate investment capital, underlining the primary role of information opacity in SME financing.

Appendix A
Research Methodology and Profile of Respondents

Survey data are more or less the only alternative if you want to have data on attitudes, perceptions, strategies, and resources from a large number of cases

(Davidsson and Wilkund 2000, p. 27)

A.1 Introduction

The research design implemented in conducting this study is outlined and explained in this appendix, and a detailed profile of respondent firms is presented. This information is important for providing an explanation for the methodology selected, as well as contextualising results and conclusions. This appendix is structured as follows; firstly, a comprehensive account of important methodological issues is provided by describing the research design employed, as well as selection of the sample frame. In the following section, the process of designing, improving, and piloting the survey instrument is detailed, along with the data collection process. Secondly, respondent firms are described in detail. Firm characteristic data presented includes age, size, sectoral composition, expenditure on research and development, and export activity. Data is presented in tabular form throughout the appendix. Supplementary tables, primarily documenting sectoral differences, are provided at the end of the appendix, and are labelled as Tables A.9, A.10, A.11, and so forth.

A.2 Data Collection

The most important consideration when choosing a research design is its appropriateness to the research question posed, referred to as "... the dictatorship of the research question (not the paradigm or method)" by Tashakkori and Teddlie (1998, p. 20). This study investigates the financing of SMEs, and the subject is addressed by considering a number of specific issues. Three questions are posed; (a) Do sources of finance

employed by SMEs change across age profiles?; (b) Are sources of finance employed by SMEs determined by firm characteristics?; and (c) What are firm owners' goals and preferences when considering the financing decision?. These research questions investigate SME financing on two levels of analysis, and require firm characteristic data, as well as information on financing preferences and objectives of firm owners. Firm financing is analysed across a life cycle continuum, and data required to conduct this research is not publicly available. There are difficulties with secondary databases, such as exist, as explained in the following section. Furthermore, information on the motivations, business goals, and financing preferences of SME owners is difficult to obtain by means other than primary data collection.

A consideration for SME researchers is the paucity of secondary sources of data on SME resourcing, which requires them to engage in primary research to compile this information. For example, researchers in the US and the UK employ detailed survey instruments to compile databases on the financing of SMEs by conducting the National Survey of Small Business Finances (NSSBF) and the United Kingdom Survey of Small and Medium-sized Enterprises' Finances (UKSMEF) respectively. Although secondary sources such as NSSBF data contain a large number of observations, they suffer from a degree of coverage error. For example, the NSSBF is representative of approximately 5 million nonfirm, for profit, nonfinancial SMEs with less than 500 employees. Whilst data generated by these cross-sectional studies is not perfect for conducting longitudinal analysis, they provide researchers with a large volume of observations on which to conduct detailed statistical analysis.

In keeping with the positivist epistemological orientation of this study, and in common with data collection methods employed in previous studies, a self-administered questionnaire survey was employed to collect data. The primary advantage of the methodology employed is that it facilitates collection of data unavailable from any other source, and facilitates collection of information required to answer specific research questions. Additional benefits of using surveys are:

> . . ...[that they] can be used to (1) test some of the qualitative assumptions and conclusions in the capital structure literature, and (2) indicate practitioners' perceptions when making capital structure choices
>
> (Norton 1991, p. 162).

Use of a questionnaire survey instrument was therefore deemed the most appropriate method of data collection for this study. Requesting uniform data from respondents, this methodology facilitates comparative statistical analysis. Additionally, questionnaire surveys are a relatively cheap and efficient means of data collection, and enabled the research to be completed within time and resource constraints.

A.3 Selection of the Sample Frame

Survey research is conducted to estimate the distribution of characteristics in a population within defined confidence limits (Dillman 2007). Generalisability of results of a survey study is therefore dependent on the use of a representative

sample from the total population. One of the greatest challenges in conducting survey research on the SME sector is the well documented non-availability of total population listings. Previous researchers in many countries have highlighted the lack up-to-date complete population lists of SMEs, notwithstanding the difficulty in maintaining these lists because of frequent changes due to many new entrants, and a substantial number of SMEs ceasing to trade within 3 years of start-up (Cressy 2006b). Researchers endeavour to overcome lack of total population listings in a number of ways. Previous researchers have selected samples employing a variety of sources: (1) by compiling their own list from a number of directories (Hogan 2004), (2) by employing a list from one source; for example, a list of the occupants of a business or science park (Westhead and Storey 1997, Ullah and Taylor 2005), (3) By employing commercially available lists, such as the Dun and Bradstreet database used by Hall et al. (2004), (4) By employing listings from government development agencies (Kinsella et al. 1994), (5) By employing data from commercial banks (Audretsch and Elston 1997), and (6) By surveying or interviewing firms on the basis of accessibility (Howorth 2001). A common difficulty with each of these sample frames is that they are not representative in the true sense, as they are not random samples drawn from complete national populations. These samples are typically confined to a geographical area or an industry sector. Of course, researchers are upfront about this and most studies explicitly state that they are not representative of the total SME population in the countries surveyed.

Curran and Blackburn (2001, p. 60) note that "... there is no single publicly accessible register of businesses in the UK", which is also true in the Irish case. Consequently, it is difficult to obtain a random or probability sample in the strict quantitative sense. When considering a sample frame of SMEs on which to conduct a questionnaire survey, a number of sources can be investigated. Perhaps the most complete listing of the total business population may be obtained from the Value Added Tax (VAT) register of the office of the revenue commissioners. This register includes persons supplying goods or services within the state if their turnover is above certain limits (over €35,000 for those supplying services, and €70,000 for those supplying goods). Although this register details the number of enterprises registered by sector, there are difficulties with using this listing because it includes entities that may never have traded, or individuals who have registered for purposes other than engaging in business.

Another source of information is the Companies Registration Office (CRO), which is the statutory authority for registering all new companies in the Republic of Ireland. It is the central repository of public information on Irish companies, maintaining a database on all incorporated firms in the state, and all companies are obliged to file accounts yearly. Some of this data is freely available, and other information is accessible on payment of a fee. Whilst the database of CRO companies may be a reasonably accurate listing of all incorporated firms in the state, a number of features of these records make them unsuitable for academic research. Firstly, the database is not up-to-date and contains a number of firms that have ceased trading. Additionally, accounts for recent years are typically not available, with some firms not having filed accounts for 5 years or more. Secondly,

accounting information provided in a number of cases is limited, as some firms are only obliged to provide an abridged balance sheet. The database is thus not consistent in terms of accounting information supplied. Thirdly, non incorporated firms are excluded from this database.

National development agencies Enterprise Ireland (EI), the Industrial Development Authority (IDA), the Shannon Free Airport Development Company (SFADCo), Údarás na Gaeltachta, and county enterprise boards maintain a list of client companies, although this information is not publicly available because agencies insist on maintaining confidentiality. For example, Enterprise Ireland cite inability to decouple contact details of companies from confidential financial information, and so do not release details of these firms. Another potential source of information is the Central Statistics Office (CSO), which conducts censuses at various intervals, such as the Census of Agriculture, Census of Building and Construction, the Information and Communications (ICT) survey, the annual Services Enquiry, and the annual Census of Industrial Enterprises (conducted regularly since 1975). The latter two are the most comprehensive, including firms with more than three employees, and providing analysis of enterprises by size and sector. These censuses are valuable for providing important structural data on two sectors, although information on specific firms is not available from the CSO as they emphasise confidentiality of data supplied by respondents.

Yet another potential source of information on SMEs are member lists maintained by SME organisations such as the Irish Small and Medium Sized Enterprises Association (ISME), the Small Firms Association (SFA), and Plato Ireland Limited. These lists are not representative of the Irish SME population, however, as they "suffer" from self selection, and they have size and sectoral biases. For example, the Plato Ireland organisation is concentrated in seven geographical regions, and member firms typically have between 3 and 50 employees.

Commercially available databases may be sourced from companies such as Dun and Bradstreet. The latter database contains detailed accounting data on selected companies, and has been employed in previous empirical studies of SME financing (Hall et al. 2004). Use of this listing to extract a representative sample of SMEs on which to distribute a questionnaire instrument has a number of drawbacks, however, primarily because it does not include the total population of SMEs. Similar to listings from other sources, firms no longer trading may remain on the Dun and Bradstreet database. New firms may not have been entered on the database if there have been no requests for credit information about the business (Curran and Blackburn 2001). In common with other commercially held databases, smaller, newer firms are thus most likely to be underrepresented on the Dun and Bradstreet listing.

Considering the issues outlined above, and the level of resources available, the sample frame selected for this study is based on non-probability sampling. The sample frame employed is the Business World "Next 1,500" list of firms. This list is compiled from a number of sources, including CRO data, print and internet media sources, the National Directory Database (NDD), and is maintained and updated once a year by Business World. This firm compiles a list of the "Top 1,000" firms

annually, measured by turnover. A list of the "Next 1,500" is also compiled annually, based on firms with at least 20 employees. The "Next 1,500" listing provides contact details of each firm; classification by NACE code; names and contact details of a number of officers, including the managing director, financial controller, IT, personnel, operations, marketing, quality and health and safety managers; and in a number of cases the number of employees. It is readily acknowledged that this list is not representative of the total Irish SME population, and it contains predominantly medium sized firms as defined by the European Commission (2003). Micro enterprises and small firms with between 10 and 20 employees are not represented in the listing. Firms on the "Next 1,500" list thus represent a sample of successful, surviving, medium sized firms that have a minimum of 20 employees, which is similar to the profile of Irish firms in Storey and Johnson (1987). (In other countries, such as the US for example, these firms might be considered SMEs, rather than medium sized). Unlike sample frames employed in a number of previous studies, this listing does not suffer from sectoral or regional bias, as the sample selected is not confined to particular sectors or geographical regions. It is difficult to confirm representativeness of the sample by sector, although in the case of firms in services and industrial production sectors an approximate estimate may be ascertained by comparison with CSO annual censuses. Use of this sample frame means that the study is subject to survivorship bias, as non-surviving firms are not included.

The sample frame contains 1,503 firms in total. This list was substantially "cleaned" and refined to obtain a list of firms consistent with the aims of the study, i.e. independent, non-financial firms, within the parameters of the European Commission (2003) definition of an SME. Subsidiaries of multinational and national parent companies were removed from the total sample frame, numbering 578 and 195 firms respectively. This data highlights a distinctive feature of the Irish industrial structure, i.e. the presence of a large number of multinational companies. 13 banking and finance firms were excluded, and 15 firms were no longer at the given address or had gone out of business. Some of this information was included in the database, and the remainder was gleaned in the course of data collection. The "cleaned" database included 702 firms in total, and this information is summarised in Table A.1.

A.4 Development of the Questionnaire Instrument

Data for this study was collected by means of a self-administered questionnaire instrument. A number of appropriate questions were immediately apparent in variables required to answer the research questions posed. The remaining questions were generated to collect data to test propositions formulated from theoretical and empirical literature. In formulating and developing questions for the survey instrument, questionnaires previously designed by researchers in conducting capital structure investigations were consulted and considered. These included survey

Table A.1 Database detail and survey response rate

	Number of firms	
Sample size		1,503
Ineligibles:		
Banking and finance firms	13	
Subsidiary – multinational parent (includes takeovers)	578	
Subsidiary – Irish parent	195	
No longer at this address/no longer in business	15	
Total ineligible		801
Total eligible		702
Valid/useable returns		299
Response rate (%)		42.6

instruments employed in corporate finance research (Norton 1991; Graham and Harvey 2001), and instruments designed for studies in the SME sector (Cressy and Olofsson 1997b; Michaelas et al. 1998; Hogan 2004). Additionally, questions employed in previous papers were replicated where appropriate (Cooley and Edwards 1983; LeCornu et al. 1996). The advantage of consulting previous survey instruments and adopting questions posed in previous studies when creating a questionnaire is that questions have undergone cognitive testing, and are less susceptible to misinterpretation or misconstruction. Additionally, there may be useful comparative elements between studies.

In designing questions to elicit sensitive financial information and capital structure data, account was taken of the findings of Ang (1992) and Avery et al. (1998) regarding interconnection of firm owners' income with firm financing. Consideration was also taken of experiences of researchers conducting regular survey research on SME financing, such as that of Cox et al. (1989), who reported difficulties in sourcing accurate financing data from respondents when compiling the NSSBF. This problem is universal. For example, the Small Business Survey in the UK reported that "...Unfortunately, some 29% of businesses could not, or would not, provide information on turnover" (Small Business Service 2006, p. 4). Because of the reluctance of firm owners to report this data, sources of financing were requested in percentage rather than absolute form. Responses to this question provided rich data, and have an advantage over questions posed in previous studies which request mentions (Holmes and Kent 1991), or perceived importance (Cressy and Olofsson 1997b) of the source of finance employed. Similar data was also requested for the start-up stage of the firm. One disadvantage of requesting this data is the potential for error, similar to that noted by Cox et al. (1989) when requesting absolute amounts. Notwithstanding the potential for reporting error, requesting percentage rather than absolute amounts proved successful in limiting non response, as 92% of respondents provided usable replies to the "sources of financing used at present" question.

Similarly mindful of respondents' reluctance to report data pertaining to financing, turnover information was requested separately in categorical form. Further demographic information on respondents was collected in categorical form and determined by; the European Commission (2003) definition (number of

employees); NACE codes (sector); or previous studies (age categories as used in previous Industrial Development Authority (IDA) censuses). One of the goals of this study is to investigate motivations, business goals, and preferences of the firm owner in relation to the financing decision. The survey instrument contained questions on financing preferences of the firm owner, as well as questions seeking to ascertain the most important considerations when raising additional debt or equity financing. Principal financial objectives of firm owners were sought, along with views on funders and requirements of financiers. Questions were also formulated seeking respondents' views on the influence of the debt-tax shield, timing, and signalling considerations on the financing decision. An alternative means of investigating these theories is to test multivariate models employing proxy variables, although it is difficult to make accurate deductions and predictions based on proxies. Employing direct questions to investigate these issues has advantages over testing their applicability using proxy variables, and highlights an advantage of survey research in this regard.

When determining the order of questions, it was decided not to place questions requesting sensitive information at the very beginning of the questionnaire. Questions requesting capital structure data were therefore contained on the third page of the questionnaire, following questions requesting relatively less sensitive information. "Demographic" information was requested on the final page, based on the reasoning that respondents are likely to grow weary towards the end of the questionnaire, and this information is relatively easy to recall.

A.5 Elements Incorporated to Improve Response Rate

The cover page of the questionnaire instrument provided a description of the purpose of the study, along with a request that the survey be completed by the chief financial officer, or equivalent representative. The confidentiality of replies was emphasised, and an average completion time (which emerged from the pilot study) was suggested. Contact details of the researcher were also provided.

Empirical evidence from a number of studies indicates that university sponsorship increases response rates (Fox et al. 1988; Faria and Dickinson 1992, 1996), and so the ideogram of the universities of the researcher (Dublin City University) and his supervisor (Trinity College Dublin) were emblazoned on the cover of the questionnaire. Additionally, the ideogram of the researcher's university was on the cover letter and the return envelope supplied. Dillman (2000) states that this adds prominence to the survey instrument, and helps recognition. This latter point is particularly important, as a proportion of respondents are likely to be graduates of business degrees delivered by either university. Dublin City University delivers one of the most popular undergraduate accounting programmes in the country, a qualification commonly held by chief financial officers in Irish SMEs.

The postal questionnaire was printed on coloured paper to enhance recognition, and to distinguish it from the multitude of other postal questionnaires that SMEs

receive. Although previous studies report that use of coloured paper does not elicit a higher response rate than white paper (Booth 2003; Newby et al. 2003), follow-up telephone calls revealed that a number of respondents were able to locate the questionnaire instruments on their desks amid a myriad of other paperwork because of the distinctive colour. This is consistent with the "greater retrievability effect" discovered by Nederhof (1988).

Dillman (2007) recommends inclusion of a return envelope to reduce inconvenience to respondents. Although empirical evidence indicates that use of postage stamps on return envelopes, rather than business reply envelopes result in greater response rates because they are seen as more personal (Armstrong and Lusk 1987; Fox et al. 1988), respondents were supplied with a Freepost envelope in which to return completed survey instruments as it was more efficient. Despite clear notification of the prepaid return envelope, a number of respondents paid additional postage on return envelopes.

Empirical evidence from previous studies indicates that monetary (Duncan 1979; Jobber et al. 2004) and nonmonetary (Willimack et al. 1995) incentives increase the response rates and the speed of return (Nederhof 1983a) of questionnaire surveys. The reasoning behind provision of incentives is that they induce greater participation by respondents, although the increase in response rate is negligible when used in surveys with high base response rates (Nederhof 1983a, p. 109). Taking account of the cost of providing monetary incentives (Jobber et al. 2004), it was decided to make a donation to charity for each completed survey received. This inducement is similar to the one offered by Faria and Dickinson (1992), who noted a positive effect on response rate and response speed.

Experts in survey research indicate that multimode approaches in survey delivery provide superior response rates to single mode approaches (Schaefer and Dillman 1998). Simsek and Veiga (2001) outline the advantages of, and need for increased use of internet surveys. Following the recommendation of Dillman (2007), an internet version of the survey instrument was developed using the *SurveyMonkey.com* website. Layout of the internet version of the questionnaire was identical to the paper based version. Approximately 17% of respondents availed of this mode of response, as shown in Table A.2.

An important issue in adopting a survey methodology for data collection is non-response bias. Difficulties arise in aggregating results to the population of SMEs, as the profile of respondents may be significantly different from non-respondents. Non-response bias is commonly tested by comparing characteristics and data of respondents with non-respondents. This test is not possible in the present study because of anonymity of replies. Another means of testing for non-response bias is

Table A.2 Response rate by mode of delivery

	Number of useable responses	Percentage of total
Postal returns	249	83
On-line returns	50	17
Total useable responses	299	100

to compare data of early respondents with that of late respondents, as Oppenheimer (1966) contends that late respondents are expected to be more similar to non-respondents. This test was conducted on the financing data and firm characteristics of respondents. No material differences were found between early and late respondents, suggesting no reason for concern about non-response bias in the data.

A.6 Piloting and Testing the Questionnaire Instrument

A preliminary version of the questionnaire instrument was circulated among academics specialising in areas of economics, statistics, research methods, SME finance, marketing, and organisational behaviour. Feedback was requested on all elements of the survey instrument, including data requested and implications for analysis, cognitive aspects, layout and design, length of the survey instrument, and the order of questions. Feedback was requested from international academic experts in the field of SME finance, some of whom had experience in conducting survey research, including Alan Cameron, Francis Chittenden, Teresa Hogan, Claire Massey, David Storey and David Tweed. Valuable advice was also offered by Brian Lucey and Tom Mc Cluskey who had conducted questionnaire based research on Irish publicly quoted companies. Advice was also solicited from professionals engaged in the supply of financial advice and expertise to SMEs, including the head of life sciences at Enterprise Ireland (Lisa Vaughan), members of a county enterprise board, and the director of wealth management at an accounting/financial management firm (Matt Hanley). Recommendations of these academic and professional experts were integrated into the survey instrument prior to its distribution for a pilot survey.

Initially the research design envisaged testing the questionnaire instrument by conducting a focus group of SME owners, thus incorporating their suggestions into the final instrument. Over 60 firms were contacted and invited to take part in a focus group. Whilst enthusiastic about the study, they declined the invitation to take part, citing inconvenience and lack of time. This experience illustrates the difficulty in conducting small business research employing focus groups, and mirrors the experience of Blackburn and Stokes (2000), who report that it took over 100 approaches to recruit 8 participants for a focus group. A number of contactees agreed to participate in a postal piloting of the survey instrument, and to suggest improvements and amendments in a telephone follow-up.

The questionnaire was posted to ten firms for a pilot study. Postal replies were received from two respondents, and all ten firms were telephoned to elicit feedback on how the survey instrument should be improved and amended prior to distribution to the sample frame. Suggestions and recommendations for improvement from all ten respondents were incorporated into the completed questionnaire before it was distributed to the sample. Additionally, participants in the pilot study were required to record the time it took to complete the survey. The average completion time was 15 min. In lengthy telephone conversations, owners and chief financial officers of

firms selected for the pilot study were enthusiastic about the research, and forthcoming and frank in their replies, indicating the salience of the research topic for respondents. This has an important implication for the study, as Heberlein and Baumgartner (1978) find that salience of the research topic is the principal determinant of high response rates.

The method of administration selected was of multiple contacts as advised by Dillman (2007), because previous studies indicate that multiple contacts greatly increase response rate (Schaefer and Dillman 1998; Newby et al. 2003). Although studies suggest that pre-notification has a positive impact on response rates (Fox et al. 1988; Dillman 2007), it was decided not to pre-notify the sample in order to keep intrusion on firms to a minimum. The sample was contacted four times as detailed in Table A.3. The first contact was on Tuesday 3rd of May 2005, when a questionnaire was addressed to a named chief financial officer in each company listed on the database. In cases where the chief financial officer's name was not listed, the questionnaire was sent to the firm owner. The mailing contained the questionnaire, a covering letter, and a return Freepost envelope. The covering letter was personalised, as advised by Schaefer and Dillman (1998) and Dillman (2007). It was printed on letterhead stationery and outlined the context of the study and salience of the topic. Other exchange relationships were invoked (Dillman 2000), and the covering letter indicated the practical implications of the survey findings for respondents, particularly in relation to enterprise policy. The personalised covering letter also detailed the Uniform Resource Identifier (URL) where the online version of the survey instrument could be accessed.

Approximately 3 weeks after the first mailing, all firms in the sample were contacted a second time, thanking those who had returned completed questionnaires and requesting responses from the remainder. Subsequent to the second mailing, each eligible firm on the database was contacted by telephone. This contact was particularly valuable in ascertaining reasons for reluctance in responding to the questionnaire survey. Various reasons given included survey fatigue, particularly with the amount of statutory questionnaire instruments; reluctance to supply detailed financial information; fear that competitors would discover sensitive information; scarcity of resources, particularly the pressure on the time of the firm

Table A.3 Response rate by contact mode

Contact	Mode	Date	Absolute number of responses	Response rate as a percentage of total	Rate (%)
First: Covering letter and questionnaire	Mail	Tuesday 3rd May 2005	161	53.84	22.93
Second: Covering letter and questionnaire	Mail	Monday 30th May 2005	88	29.43	12.54
Third: Reminder and a short conversation	Telephone	30th May – 17th June	50	16.7	7.1
Fourth: Reminder with active link to web page	e-mail				
Overall response rate				99.9	42.6

owner; company policy; perception that they were not relevant to survey; unsure as to how to answer; and habitual consignment of the survey instrument to the waste paper basket. Four respondents completed the questionnaire survey over the telephone. E-mail addresses were requested from non-respondents, who were then sent a final reminder by e-mail with a direct link to the URL of the survey.

The methodology employed resulted in a response rate of 42.6%, or 299 respondents, as detailed in Table A.1. This is a relatively high response rate when compared with those reported by Curran and Blackburn (2001), and is possibly attributable to a number of reasons, including salience of the topic for respondents, multiple contacts (especially personal contact by telephone), and mixed mode of delivery. Finally, the data was entered into Statistical Package for Social Science (SPSS) using a pre determined coding system. The survey data was analysed using both SPSS and EViews statistical packages.

Analysis of survey data included not only testing multivariate models, but also analysis of data on firm owners' business goals, considerations when raising debt or equity, and their financing preferences. This approach was adopted to provide a more holistic explanation and complete understanding of demand side influences on capital structure choice. Additionally, the method adopted seeks to overcome Curran and Blackburn's (2001) critique of employing solely quantitative techniques. They take issue with Barkham et al. (1996), both epistemologically and methodologically, for omitting owner-manager motivations, citing "... the key importance of owner-managers in the decision making processes of the small firm" (Curran and Blackburn 2001, p. 99). The research design adopted in the present study directly addresses this criticism by specifically including the preferences and business goals of firm owners as central to the financing decision.

A.7 Profile of Respondents

Univariate data is presented in this section, contextualising the study and providing a detailed profile of respondents. The population surveyed in this study is the Business World "Next 1,500" list of companies, and so firms in the sample have between 20 and 250 employees, thus fulfilling the employment criterion of the European Commission (2003) definition of SMEs. Respondents comprise independently held, non-financial business economy firms, excluding subsidiaries of multinational or national companies. An age and industry profile of 299 respondents to the survey is provided in Table A.4.

A.8 Age Profile of Respondents

Because of the lower bound of 20 employees imposed in it's composition, micro firms and smaller firms with between 10 and 20 employees are excluded from the population surveyed. Consequently, excluded firms may have a younger profile, as

Table A.4 Age and industry profile of respondents

Panel A.		Panel B.	
Firm age (n = 297)	Proportion of respondents (%)	Industry type (n = 295)	Proportion of respondents (%)
<5 years	5.1	Metal manufacturing and engineering	15.6
5–9 years	17.2	Other manufacturing	21.3
10–14 years	12.8	Computer software development and services	17.3
15–19 years	10.4	Distribution, retail, hotels, and catering	27.5
20–29 years	21.5	Other services	9.1
>30 years	33.0	Other	9.2

it typically takes time for firms to grow and mature (Evans 1987). This is reflected in the age profile of respondents reported in Table A.4, as over 50% of respondents are more than 20 years old. At the opposite end of the spectrum, 22% of firms are less than 10 years old. The observed age profile is similar to that of previous studies (Storey and Johnson 1987), and has a number of implications for the study. Firstly, as there are a greater number of surviving older firms relative to younger firms, it is anticipated that firms in the sample generally have a greater reliance on internal equity due to the longer time period within which to accumulate retained profits, *ceteris paribus*. Secondly, the potential under representation of smaller and younger firms in the sample may result in financing issues experienced by these firms possibly being understated. This is mitigated by the fact that results highlight ways in which smaller and younger firms source finance, and overcome potential financing constraints. The absence of non-surviving firms from the sampling frame exacerbates the age bias, as a relatively greater proportion of younger firms fail (Cressy 2006b). A potential age bias was investigated by recategorising age groups, and composing three age groups of approximately equal size. Results of statistical tests on recategorised age groups were compared with results on all age groups, and found to be similar. This finding suggests that age bias is not a primary concern.

Significant sectoral differences are observed in the age profile of respondents, as evidenced by data presented in Table A.9. Almost three-quarters of respondents over 20 years old are in the "distribution, retail, hotels, and catering," and both manufacturing sectors. Respondents in the "computer software development and services" sector comprise almost 50% of firms in the youngest age categories. This outcome is consistent with the finding of Berggren et al. (2000), that manufacturing firms are on average 15 years older than business service firms when evaluated at the median. One of the reasons offered for this finding is the lower entry and exit barriers within the business service sector in comparison with manufacturing sectors. An implication for respondents in the "computer software development and services" sector is that they may face exacerbated difficulty raising debt finance, due not only to low levels of tangible assets, but also because of the lack of a trading history suggested by their age profile. The Pearson chi-square measure

reported in Table A.10 indicates that the relationship between age profile and sector is statistically significant. Significance values for Goodman and Kruskal tau, and uncertainty coefficients confirm this association, although low values for both test statistics indicate that the relationship between the two variables is a fairly weak one.

A.9 Sectoral Profile of Respondents

The population of firms surveyed was categorised across six sectors, derived from two digit NACE codes, as detailed in Appendix C. Financial firms were excluded from the sample, as their capital structures are atypical of the general SME population because of regulatory factors. Analysis of the sectoral classification detailed in Table A.4 reveals that almost three-quarters of respondents are in sectors typified by high levels of collateralisable assets (sectors other than "computer software development and services" and "other services"). Implications of this sectoral profile relate to respondents' capacity to raise debt finance, as empirical evidence indicates that firms with high levels of lien free collateralisable assets seeking external funding have a greater capacity to source external financing from debt providers, *ceteris paribus* (Coco 2000; Heyman et al. 2008).

A.10 Size Profile of Respondents

Categorisation of size by gross sales turnover in Table A.5 reveals that over 30% of respondents have gross sales turnover of between €5 million and €10 million, with a further 30% reporting an amount between €10 million and €20 million. Whilst rates of profitability and payment of dividends are the most significant factors in financing the firm, turnover is an important and commonly-used measure of size (Giudici and Paleari 2000; Lopez-Gracia and Aybar-Arias 2000; Cole 2008). A crosstabulation of turnover with age of respondents presented in Table A.11 indicates that the lowest turnover category (less than €1 million) is dominated by the

Table A.5 Size profile of respondents defined by employees and turnover

Panel A.		Panel B.	
Employees (n = 296)	Proportion of respondents (%)	Gross sales turnover (€) (n = 294)	Proportion of respondents (%)
20–50	42.4	< €1 million	3.1
50–99	30.5	€1 million to €2,999,999	11.6
100–250	27.0	€3 million to €4,999,999	13.3
		€5 million to €9,999,999	31.6
		€10 million to €20 million	32.0
		>€20 million	8.5

youngest firms, whilst the largest turnover categories are comprised of firms with the oldest age profile. This finding is consistent with the implication of Evans' (1987) study that smaller firms are, on average, younger. An implication of respondents' profile is that younger, smaller firms may have a relatively greater reliance on the personal funds of the firm owner, and a greater requirement for external sources of finance. This may result in firm owners employing financial bootstrapping methods to overcome a potential financing constraint (Winborg and Landstrom 2001; Ekanem 2005; Ebben and Johnson 2006).

Sectoral differences in firm size are apparent from results presented in Table A.13. Firms in the "distribution, retail, hotels, and catering" sector feature most prominently in the largest turnover category, a profile that is consistent with evidence cited in the Enterprise Observatory Survey (2007, p. 7). Firms in the "computer software development and services" sector comprise the greatest proportion of firms in the lowest gross sales turnover category, which may be partially explained by their relatively younger age profile. The observed profile implies that firms in this sector may have a greater external financing requirement due to lower levels of retained profits, which is the most important source of investment finance for SMEs (Vos et al. 2007; Cole 2008). The Pearson chi-square measure reported in Table A.14 indicates that the relationship between turnover and sector is statistically significant. Significance values for Goodman and Kruskal tau, and uncertainty coefficients confirm this association, although low values for both test statistics indicate that the relationship between the two variables is a fairly weak one.

Size, as measured by employees, is also detailed in Table A.5. Firms in the "distribution, retail, hotels and catering" and both manufacturing sectors employ proportionately the greatest number of employees, whilst firms in the "computer software development and services" sector are smaller. Once again, this may be partly attributed to the age profile of respondents, which is inversely proportionate to size. Additionally, it may reflect the labour intensive nature of the "distribution, retail, hotels, and catering" sector.

A.11 Respondents' Expenditure on Research and Development

A requirement for additional external financing is generally related to the presence of positive NPV projects, or growth options. One indicator of the pursuit of growth is current expenditure by firms on Research and Development (R&D). Successful realisation of a firm's R&D projects may be essential for revenue streams and future growth options.

Research activity of respondents, expressed as a percentage of turnover spent on R&D, is reported in Table A.6. Whilst this measure has a turnover bias, i.e. greater absolute expenditure results in a relatively higher percentage in firms with smaller turnover, this information is important in compiling a profile of respondent firms. One-third of respondents do not engage in R&D, and a further 50% indicate that

Table A.6 Reported R&D expenditure of respondents as a percentage of turnover

Percentage of turnover spent on R&D (n = 287)	Proportion of respondents (%)
0	33.8
<10	51.6
10–29	9.8
30–50	3.8
>50	1.0

less than 10% of turnover is spent on R&D. 1% of respondents spend more than 50% of turnover on R&D, comprising firms in the lowest income category with the youngest age profile. The relatively low expenditures on R&D reported by respondents reflect national statistics of expenditure on R&D equalling 1.26% of Gross National Product (GNP), which is lower than the average for the European Union of 27 countries (CSO 2006).

Analysis of data presented in Table A.15 reveals sectoral differences in R&D expenditure. Firms in the "computer software development and services" sector report the highest expenditure on R&D as a percentage of turnover. Whilst this finding may reflect greater absolute expenditure on R&D by firms in the sector, it may also be a function of lower turnover, as detailed in the preceding section. Furthermore, this result possibly reflects a more intensive research focus by firms in the "computer software development and services" sector than other sectors, such as "distribution, retail, hotels, and catering", for example. The relationship between expenditure on R&D and sector is statistically significant, as indicated by significance values for Pearson chi-square, Goodman and Kruskal tau, and uncertainty coefficients presented in Table A.16. Low values for the latter two test statistics indicate that this relationship is a weak one, however.

A relatively high expenditure on R&D relative to turnover has a number of implications for the financing decision, particularly for firms with low levels of collateralisable assets. Firstly, such firms may not prove attractive to debt financiers due to low levels of fixed assets and a low level of cash flow with which to service regular loan repayments. Secondly, R&D activities are generally firm-specific, and residual value of research projects is typically low in the event of project failure (Storey 1994b).

A.12 Export Activity of Respondents

A further important indicator of growth potential is the level of export activity, due to the relatively limited size of the domestic market. Data presented in Table A.7 indicates a relatively low percentage of turnover generated from exports, with over 50% of respondents generating over 90% of turnover in the domestic market. These results are consistent with evidence compiled by the Observatory of European SMEs presented in Table A.8.

Table A.7 Respondents' export revenue as a percentage of turnover

Exports as a percentage of turnover (%)	Proportion of respondents (%) (n = 293)
0	27.3
<10	25.6
11–25	10.2
26–50	9.9
51–75	8.9
>75	18.1

Table A.8 Turnover generated from exports by Irish SMEs in 2005

Turnover generated from exports	Proportion of respondents (% of valid replies) (n = 553)
<€150,000	61.7
€150,000–€500,000	16.7
€500,000–€1 million	5
€1 million–€2 million	8.4
€2 million–€5 million	3.4
>€5 million	4.9

Source: European Commission (2007, p. 15)

Export-led growth is important for all sectors, although firms in the "distribution, retail, hotels, and catering" sector typically do not engage in a high degree of export activity. Sectoral variations in percentage of turnover generated from exports are evident from data presented in Table A.17. Firms reporting the highest levels of export-generated revenue are in the "computer software development and services" and both manufacturing sectors. This is not an unexpected result, and is consistent with empirical evidence on SME export activity by sector reported in the Enterprise Observatory Survey (2007, p. 15). The relationship between export revenue and sector is statistically significant, as indicated by significance values for Pearson chi-square, Goodman and Kruskal tau, and uncertainty coefficients presented in Table A.18. Relatively low values for the latter two test statistics indicate that this relationship is a weak one, however.

Financing implications for firms engaged in a high level of foreign trade emanate primarily from fluctuations in exchange rates, which may have an adverse impact on the financing of SMEs in a number of ways. Firstly, firms importing goods and raw materials from non-euro currency countries are adversely affected by a weakening euro. Firms exporting goods to non-euro currency countries are adversely affected by a strengthening euro, resulting from decreased demand. Whilst exposure to adverse changes in exchange rates has diminished in the euro zone with the introduction of a common currency in 2003, it remains a significant factor for Irish firms whose two main trading partners are the US and the UK. Adverse changes in exchange rates are more problematic for SMEs than LSEs, because SMEs typically do not have cash reserves to withstand adverse movements in exchange rates. Furthermore, SMEs typically do not employ currency hedging instruments. Resulting levels of exposure to accounting and economic risk may affect the firm's ability to raise additional external financing.

Supporting Tables Presenting Results of Crosstabulations, Chi-square Tests, and Directional Measures.

Table A.9 Crosstabulation of age by sector (% of respondents)

Age of firm (years)	Metal manufacturing and engineering	Other manufacturing	Computer software development and services	Distribution, retail, hotels, and catering	Other services	Other	Total
<5	0.3	1.7	1.7	0.7	0.7	0	5.1
5–9	1	1.4	8.8	3.4	0.7	2	17.3
10–14	0.7	3.1	2.7	3.1	1.7	1	12.3
15–19	1.7	2.4	1.7	2.4	1.4	1	10.6
20–29	6.1	5.1	2	4.4	2.4	1.7	21.7
>30	5.8	7.8	0.3	13.6	2.4	3.4	33.3
Total							100

Table A.10 Chi-square and directional measures for crosstabulation of age by sector

		Value	Approximate significance
Pearson Chi-square		88.34	0.000***
Goodman and Kruskal tau	Firm age dependent	0.079	0.000***
	Sector dependent	0.067	0.000***
Uncertainty coefficient	Firm age dependent	0.094	0.000***
	Sector dependent	0.090	0.000***

***Statistically significant at the 99% level of confidence

Table A.11 Crosstabulation of age by turnover (% of respondents)

Age of firm (years)	Turnover					
	<€1 m	€1 m to €2,999,999	€3 m to €4,999,999	€5 m to €9,999,999	€10–€20 m	>€20 m
<5	1.4	0.7	0.7	1.4	1	0
5–9	1	3.4	3.1	4.4	4.4	0.7
10–14	0	2	1.4	3.4	5.1	1
15–19	0.3	2	1.4	3.1	3.4	0.3
20–29	0.3	1.4	2.4	8.8	6.8	2
>30	0	2	4.4	10.5	11.2	4.4
Total						100

Table A.12 Chi-square and directional measures for crosstabulation of age by turnover

		Value	Approximate Significance
Pearson Chi-square		55.03	0.000***
Goodman and Kruskal tau	Firm age dependent	0.031	0.009***
	Turnover dependent	0.019	0.290
Uncertainty coefficient	Firm age dependent	0.044	0.013***
	Turnover dependent	0.047	0.013***

***Statistically significant at the 99% level of confidence

Table A.13 Crosstabulation of turnover by sector (% of respondents)

Turnover (in €m)	Metal manufacturing and engineering	Other manufacturing	Computer software development and services	Distribution, retail, hotels, and catering	Other services	Other	Total
<€0.750	0.3	0.3	2.1	0	0.3	0	3.1
€0.750–€0.999	1.7	1.7	4.8	2.1	0.7	0.7	11.6
€1–€2.9	3.1	1.4	2.1	3.1	1.4	2.1	13
€3–€4.9	6.5	8.6	4.5	7.2	3.4	1.4	31.5
€5–€9.9	3.4	8.2	3.8	11	2.1	3.8	32.2
>€10	0.7	1	0	4.1	1.4	1.4	8.6
Total							99

Table A.14 Chi-square and directional measures for crosstabulation of turnover by sector

		Value	Approximate significance
Pearson chi-square		62.91	0.000***
Goodman and Kruskal tau	Turnover dependent	0.038	0.001***
	Sector dependent	0.047	0.000***
Uncertainty coefficient	Turnover dependent	0.068	0.000***
	Sector dependent	0.062	0.000***

***Statistically significant at the 99% level of confidence

Table A.15 Crosstabulation of R&D expenditure by sector (% of respondents)

% of turnover spent on R&D	Metal manufacturing and engineering	Other manufacturing	Computer software development and services	Distribution, retail, hotels, and catering	Other services	Other	Total
0	5	4	3	13	5	4	34
<10	10	16	6	12	5	3	52
10–29	1	1	5	1	0	1	9
30–50	0	1	3	0	0	0	4
>50	0	0	1	0	0	0	1
Total							100

Table A.16 Chi-square and directional measures for crosstabulation of R&D expenditure by sector

		Value	Approximate significance
Pearson chi-square		91.93	0.000***
Goodman and Kruskal tau	R&D expenditure dependent	0.094	0.000***
	Sector dependent	0.074	0.000***
Uncertainty coefficient	R&D expenditure dependent	0.135	0.000***
	Sector dependent	0.087	0.000***

***Statistically significant at the 99% level of confidence

Table A.17 Crosstabulation of export revenue by sector (% of respondents)

Foreign sales as % of turnover	Metal manufacturing and engineering	Other manufacturing	Computer software development and services	Distribution, retail, hotels, and catering	Other services	Other	Total (%)
0	2	2	2	12	4	5	27
<10	5	5	2	8	4	2	26
11–25	2	3	2	2	1	0	10
26–50	2	3	2	3	0	0	10
51–75	1	3	4	1	0	0	9
>75	4	6	5	0.5	0.5	2	18
Total							100

Table A.18 Chi-square and directional measures for crosstabulation of export revenue by sector

		Value	Approximate significance
Pearson chi-square		90.93	0.000***
Goodman and Kruskal tau	Export revenue dependent	0.076	0.000***
	Sector dependent	0.071	0.000***
Uncertainty coefficient	Export revenue dependent	0.109	0.000***
	Sector dependent	0.107	0.000***

***Statistically significant at the 99% level of confidence

Appendix B
Previous Related Literature

Most research on capital structure has focussed on public nonfinancial corporations with access to U.S. or international capital markets. . . .Yet even 40 years after the Modigliani and Miller research, our understanding of firms' financing choices is limited

(Myers 2001, p. 82)

B.1 Introduction

This section outlines the literature that forms the theoretical bedrock for the research. As noted in the opening chapter, a primary focus of earlier academic and policy research on SME financing concerns the provision of adequate investment finance to firms in the sector. Corporate finance capital structure literature, by contrast, is principally concerned with explanations for the debt/equity choice. Hence, similar to previous studies investigating determinants of SME financing, the theoretical basis for this study derives from capital structure theory developed in the field of corporate finance.

Development of capital structure theories originate from the irrelevance propositions of Modigliani and Miller (1958) (often referred to as the "seminal" work of Modigliani and Miller). Almost every treatment of capital structure in academic papers and finance textbooks refers to the influential Modigliani and Miller (1958, 1963), and they spawned a vast literature of theoretical and empirical work. In brief, the theory of capital structure has developed as follows: in 1958 Modigliani and Miller proposed that a firm's capital structure was independent of its cost of capital, and therefore of firm value. The propositions of 1958 were based on a number of unrealistic assumptions, and in 1963 taxes were introduced into the model. This led to the development of trade-off theory (Miller 1977; DeAngelo and Masulis 1980), whereby tax-related benefits of debt were offset by costs of financial distress. Alternative approaches based on asymmetric information between "inside" managers and "outside" investors include signalling theory (Ross 1977), and the pecking order theory (Myers 1984; Myers and Majluf 1984). The latter postulates

that when internal sources of finance are not sufficient for investment needs the firm has a preference to raise external finance in debt markets, with equity issues the least preferable source. A further approach considered a nexus of relationships, characterised as principal-agent relationships, and potential agency costs on the firm (Jensen and Meckling 1976).

Research on the composition of capital structure in SMEs has a relatively shorter history. The earliest papers investigating the financing of SMEs concentrated on differences between SMEs and Publicly Listed Companies (PLCs) (Walker and Petty 1978; Tamari 1980; Norton 1990; Ang 1991). Notwithstanding these dissimilarities, particularly differences in the nature of financial markets accessed by both types of firm, capital structure theory developed in corporate finance formed the theoretical basis for subsequent studies on the financing of SMEs (López-Gracia and Sogorb-Mira 2008, Heyman et al. 2008, Daskalakis and Psillaki 2008). Empirical evidence from these studies confirms the relevance of capital structure theories for SME financing, albeit employing a different rationale than their corporate finance counterparts.

This appendix proceeds as follows: beginning with the propositions of Modigliani and Miller (1958), a number of capital structure theories from the corporate finance literature are described. Each description includes a brief consideration of empirical evidence, as well as how each theoretical approach is applied in the SME literature. In the following section empirical evidence from previous studies on the financing of SMEs is examined on two levels of analysis, and conclusions are drawn. This review is succinctly summarised in Table B.9 at the end of the appendix.

B.2 The Modigliani and Miller Propositions

Modigliani and Miller's 1958 paper was groundbreaking, as it examined the effect of capital structure on firm value within a micro-economic framework. By examining the effect of capital structure on the cost of capital, and therefore the market value of the firm, Modigliani and Miller (1958) demonstrate that under a number of assumptions the source of financing employed has no effect on firm value. Modigliani and Miller conclude that firm value is determined by the profitability and riskiness of its real assets, and not by its capital structure. This was contrary to the prevailing view of the time, which contended that prudent use of cheaper debt could increase the market value of the firm. The first proposition of Modigliani and Miller (1958) is that there is no "magic" in financial leverage, and so the value of an unlevered firm is equal to the value of a levered firm.

Modigliani and Miller's second proposition (1958) is that the overall cost of capital cannot be reduced by substitution of debt for equity, even though debt seems cheaper. This is because, as more risky debt is added to the capital structure, equity holders demand a risk premium, which would at some point counteract the benefit from cheaper debt. They conclude that there is no advantage or disadvantage of financing with debt, and as a result the value of the firm remains unchanged. Miller (1991, p. 483), in his Nobel prize winning speech, put it thus:

> The M&M [Modigliani and Miller] propositions are the finance equivalent of conservation laws. What gets conserved in this case is the risk of the earnings streams generated by the firm's operating assets. Leveraging or deleveraging the firm's capital structure serves merely to partition the risk among the firm's security holders.

Recognising that the assumption of perfect markets was unrealistic, in particular the absence of corporate taxes, in 1963 Modigliani and Miller introduced taxes into the model. Within the tax system interest payments on debt are allowable against corporate tax, whereas dividend payments are not. Thus, the tax system provides a "tax shield" to the firm, and so a firm with debt faces a lower corporate tax bill than a similar all-equity financed firm, *ceteris paribus*. Modigliani and Miller (1963) conclude that with corporate taxes the optimal capital structure occurs at 99.9% debt.

This proposition is highly unrealistic, and is rarely observed in reality (apart from cases of extreme financial distress). The relatively low use of debt for investment observed in practice suggests that other factors impinge on the equilibrium model proposed by Modigliani and Miller (Myers 2001), particularly in relation to the restrictive assumptions on which the model is based. A number of these factors may be categorised by static trade-off theory, theories based on signalling and asymmetric information, and agency theory. Each theory is considered in succession in the following sections.

B.3 Static Trade-Off Theory

A key assumption of Modigliani and Miller's propositions is that debt is risk free. This assumption does not hold in reality, as debt must be serviced with regular repayments of interest and principal. If a part debt-financed firm experiences a decline in income from operations, it may default on some or all of its debt. Costs associated with the possibility of default take many forms and can result in varying degrees of financial distress. Likely costs of financial distress are difficult to quantify, although Andrade and Kaplan (1998) estimated them to form 10% to 20% of a firm's market value. There is therefore a trade-off between the tax benefits of debt and potential costs of financial distress. A theoretical optimum is reached when the present value of tax savings due to further borrowing is just offset by increases in the present value of costs of distress, as shown in Fig. B.1. In accordance with the trade-off theory, firms have an optimal debt ratio which they attempt to maintain. There are, of course, limits to the use of interest tax shields, and "...You can't use interest tax shields unless there will be future profits to shield, and no firm can be absolutely sure of that" (Brealey et al. 2006, p. 488). The trade-off theory recognises that target debt ratios may vary from firm to firm. "Firms with tangible assets and ample taxable income to shield ought to have high target ratios, whilst unprofitable companies with risky, intangible assets ought to rely primarily on equity financing" (Myers 2001, p. 91). There is, however, a pattern of financing that trade-off theory cannot explain. According to the trade-off theory, the most

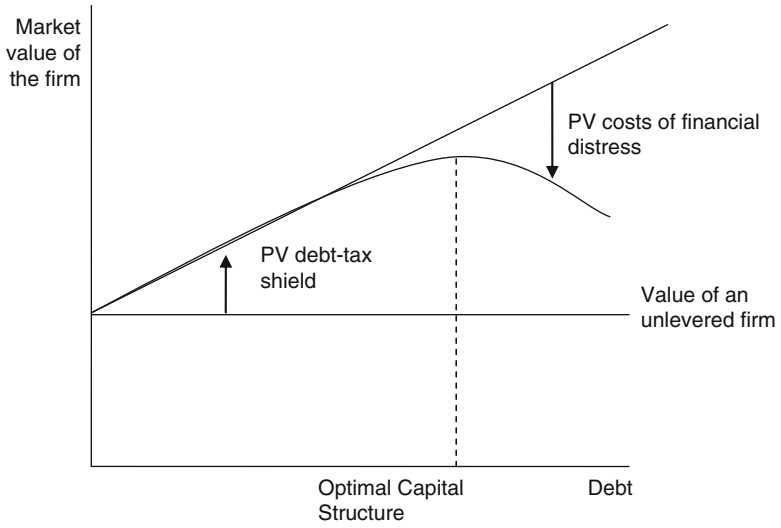

Fig. B.1 The static-trade off theory of capital structure

profitable firms should potentially benefit most from employing an optimal level of debt, *ceteris paribus*.

This is not observed in reality, however. Empirical evidence indicates that the most profitable firms borrow least (Wald 1999; Myers 2001; Fama and French 2002), and Fama and French (1998) find that debt tax shields do not contribute to a firm's market value. By contrast, Graham (2000) finds that capitalised benefits of the debt tax shield constitute almost 10% of firm value. Furthermore, Graham and Harvey (2001) report that 44% of survey respondents have target debt ratios, and Flannery and Rangan (2006) find evidence for partial adjustment to target debt ratios. Notwithstanding limited empirical evidence for the trade-off theory, it appears that whilst tax effects may have an effect on financing choice, they are not of first-order importance (Myers et al. 1998; Graham 2003).

The relationship between leverage and the value of the debt tax shield is further complicated by other shields which may prove more valuable. Depreciation and investment credits reduce a firm's taxable income and result in a decrease in the likelihood of it being able to use its entire interest tax shield (DeAngelo and Masulis 1980). Furthermore, research and development expenditure can be expensed rather than capitalised, reducing taxable income. Accordingly, firms with non-debt tax shields should employ less debt in their capital structure, *ceteris paribus*. Empirical evidence, however, reveals the opposite, finding that leverage is directly related to the availability of non-debt tax shields (Titman and Wessels 1988). This can be interpreted as evidence that assets that generated such tax shields can be used as collateral for additional debt, suggesting support for the "... secured-debt hypothesis" (Smart et al. 2007, p. 475), whereby firms with higher levels of tangible assets can support higher levels of debt.

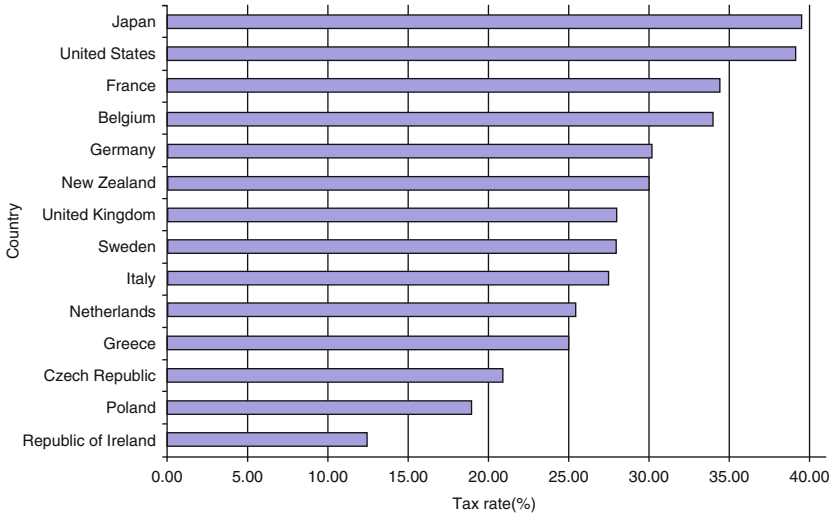

Fig. B.2 Combined corporate income tax rates (%) 2008
Source: OECD (2008)

Macroeconomic factors have a significant influence on the value of debt-tax shields. Country-specific factors relating to rates of taxation and tax deductibility of interest payments are of primary importance (Walsh and Ryan 1997). Although virtually all countries permit firms to deduct interest payments from taxation (McIntyre 2008), the debt tax shield reduces in value as the marginal tax rate falls. Thus, profitable firms operating in high corporate tax jurisdictions have a greater incentive to use the debt-tax shield than profitable firms in low tax jurisdictions, *ceteris paribus*. For example, Desai et al. (2004) find that multinational companies finance subsidiaries with debt rather than equity in jurisdictions with higher corporate tax rates. The central government corporate income tax rate in the Republic of Ireland is extremely low in global terms, as depicted in Fig. B.2. A favourable corporate tax rate of 10% has applied to firms in the Irish manufacturing and exporting services sectors since the 1980s, partly in order to attract foreign direct investment. In 2003 a standard corporation rate of 12.5% was introduced for all firms. Thus, the debt tax shield is not as advantageous to Irish-based firms. (Although small business tax rates are lower than the corporate tax rate in a number of countries, none are lower than the Irish corporate income tax rate).

B.4 Application of Trade-Off Theory to the SME Sector

Applicability of the trade-off theory to the SME sector has been the focus of a number of studies (Heyman et al. 2008; López-Gracia and Sogorb-Mira 2008), although the debt-tax shield may not be as relevant for SMEs as it is for publicly

quoted firms. This may be explained by consideration of two factors central to trade-off theory; profitability, and financial distress. A number of studies indicate that smaller firms are not as profitable as larger firms (McConnell and Pettit 1984; Pettit and Singer 1985; Vos and Forlong 1996; Michaelas et al. 1999). Firms with lower levels of profitability have less use for debt tax shields, *ceteris paribus*. Additionally, Day et al. (1983) argue that the tax shield is less valuable to small firms as they are generally less capital intensive. This is because smaller firms adapt flexible production technologies in order to compete with larger companies operating with lower average costs, maintaining an ability to respond swiftly to changes in demand (Mills and Schumann 1985). This relatively lower capital expenditure means that the debt-tax shield is of lesser value to smaller firms, *ceteris paribus*.

A second component of the trade-off theory to consider is risk of financial distress. The ultimate consequence of financial distress is bankruptcy, and it is well established in the literature that "...young firms are more failure prone than older ones" (Cressy 2006b, p. 103). Higher bankruptcy rates in younger firms are indicative of the relatively higher business risk that smaller firms face, which may be attributed to a number of factors. Firstly, smaller businesses may be overly dependent on a small number of customers (Hudson et al. 2001). This is exacerbated by dependence of many SMEs on a single product or service (Cambridge Small Business Research Centre, CSBRC 1992). These firms are particularly vulnerable to financial distress, as loss of their principal customer(s) would severely affect their chances of survival. Secondly, nascent and early-stage firms are particularly vulnerable to problems of undercapitalisation as shown in Fig. B.3. This may be exacerbated by reduced access to sources of additional external finance due to information opacity, and lack of a trading history. Thirdly, smaller firms may be particularly vulnerable to economic shocks and adverse macroeconomic

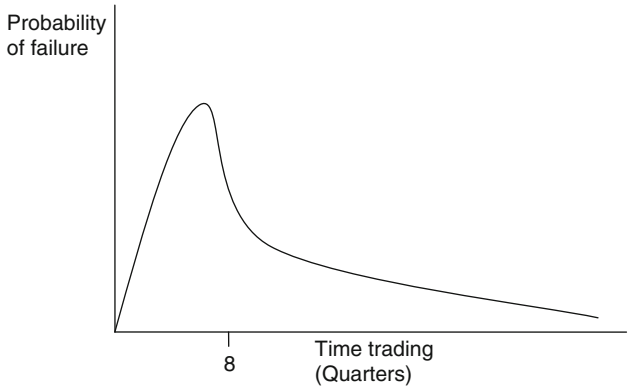

Fig. B.3 Business closure rates by time trading
Source: (Cressy 2006b, p. 104)

conditions, which are typically exacerbated by the absence of hedging instruments in their "financial portfolio." Poorly diversified undercapitalised firms are particularly vulnerable under adverse macroeconomic conditions.

The heightened business risk faced by younger, smaller firms may lead to financial distress and bankruptcy costs. The impact of bankruptcy costs for the SME owner has farther-reaching and more severe personal effects than in the case of a publicly owned company. This is due to the well-documented integration of SME owners' personal finances with the financing of the firm (Ang 1992; Avery et al. 1998). Adverse effects of bankruptcy may thus have implications for the personal affairs of the owner, particularly in firms with unlimited liability. In this case, "... consequences of business bankruptcy very often leads to personal bankruptcy, and the impact of provisions for the transfer of management and ownership to succeeding generations in a family enterprise" (McMahon et al. 1993, p. 77). An additional onerous burden of bankruptcy for the SME owner is the considerable negative effect on the owner's reputation and self-esteem (Vos and Forlong 1996), which may have adverse consequences for his personal life. Empirical evidence for the effect of bankruptcy costs is inconclusive; Michaelas et al. (1999) state that bankruptcy costs are not significant enough to prove a negative relationship between risk and gearing, although Esperanca et al. (2003) find that bankruptcy costs are a significant determinant of debt ratios. A caveat of these studies is use of the coefficient of variation in profitability as a proxy for economic risk. This measure does not encompass all aspects of risk for the SME owner, particularly the proportion of personal wealth invested in the firm. Additionally, these studies do not measure reluctance to undertake positive NPV projects due to the likelihood of financial distress.

A further theory explains the level of debt employed in SMEs as a function of the control aversion of the firm owner (Cressy 2006a). Cressy (2006a, p. 185) argues that the psychological costs of borrowing outweigh the benefits, as the small firm owner dislikes interference from debt providers. In Cressy's model, as firms get larger and less personal, aversion to bank interference diminishes, whereas in micro firms control aversion restricts the amount borrowed. As shown in Fig. B.4, the profit maximising optimum level of debt for the manager of a large firm (*dashed line*) occurs at L^{*} (Cressy 2006a). The indifference curve for the owner of a smaller firm (*full line*), is upward sloping, as profits provide positive marginal utility and borrowing provides negative marginal utility. Utility increases with higher profits and lower borrowing, and thus the optimum level of borrowing of the control-averse firm owner occurs at L^{**} (Cressy 2006a, p. 185).

A combination of factors, namely, control aversion, heightened business risk, and greater adverse consequences of financial distress suggest that the trade-off theory may have limited applicability in SME financing. Whilst firms may consider tax shield benefits when raising additional debt, the aforementioned factors appear to have a greater influence on firm financing. Evidence from previous empirical investigations of the applicability of trade-off theory to SMEs is considered in a following section.

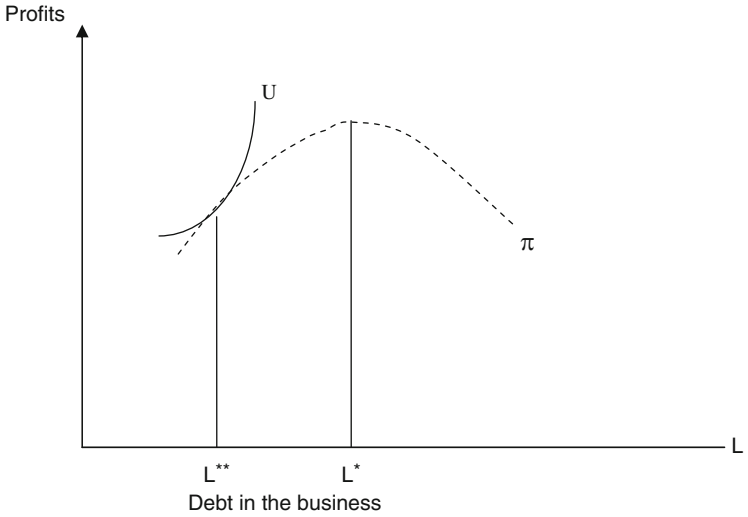

Fig. B.4 Effects of control aversion on the amount of borrowing
Source: (Cressy 2006a, p. 186)

B.5 Asymmetric Information and Signalling Theories

The Modigliani and Miller (1958) propositions were based on the assumption that corporate "insiders," and "outside" investors were privy to homogenous or symmetric information. An alternative approach to capital structure theory is based on the assumption of asymmetry of information, i.e. that firm managers or "insiders" possess private information about the firm that "outside" uninformed investors do not. This implies that market prices of firms' securities do not contain all available information, and therefore managers or "insiders" may use financial policy decisions to reveal information about firms' revenue streams and risk. Four approaches are discernible from the literature: interaction of investment and the financing decision, proportion of debt as a signalling device, models based on risk aversion, and market timing models.

Myers (1984) and Myers and Majluf (1984) present a signalling model that combines investment opportunities available to the firm and its financing decisions. Their pecking order theory is based on two primary assumptions: that a firm's managers know more about a firm's revenue streams and investment opportunities than outside investors, and that managers act in the interests of existing shareholders. This information asymmetry implies that inside managers cannot convey information to the markets about the true value of investment projects. Therefore, announcement of an equity issue to new investors will be viewed as a "bad" signal, as investors perceive that managers will only issue stock if they believe it to be overvalued by the market. Underinvestment can be avoided if the firm sources financing that is not subject to the information asymmetry problem. Funding

investment projects with internal funds overcomes this adverse signalling problem. When internal funds are exhausted, debt is preferred to external equity as it is less susceptible to undervaluation due to information asymmetries. When internal cash flow and safe debt are exhausted, the firm issues risky debt or convertibles before common stock (Myers 1984).

The pecking order theory does not propose an optimum debt/equity ratio because there are two types of equity, one at the bottom of the pecking order and one at the top. Changes in the level of debt are not motivated by the need to reach a given debt target, but are instead motivated by the need for external financing to fund positive NPV projects once internal resources have been exhausted. A firm's debt ratio reflects its past history, through its cumulative requirement for external capital, its ability to generate cash flow, its dividend policy, and finally, its investment opportunities. Thus, under the pecking order theory the ideal capital structure fluctuates over time.

Empirical evidence for the pecking order theory in corporate finance is mixed. A number of propositions of the theory are supported, such as that stock prices decrease on announcement of equity issue (Korwar and Masulis 1986) and increase on the announcement of debt issues (Kim and Stulz 1988); and a negative relationship between debt ratios and past profitability (Rajan and Zingales 1995). Further studies provide direct evidence for the pecking order theory (Shyam-Sunder and Myers 1999; Graham and Harvey 2001), although Frank and Goyal (2003) find that contrary to the pecking order theory net equity issues almost perfectly follow the financial deficit.

Another approach based on information asymmetries is the signalling model proposed by Ross (1977), whereby managers convey inside information to investors through the proportion of debt in the capital structure. Successful firms with greater revenue streams can support greater leverage than those with lower revenue streams, and the market believes that only the manager knows the true distribution of the firm's returns. The manager has an incentive to give the correct signal of the firms' quality to the market, as he benefits if the firms' securities are more highly valued by the market but is penalised if the firm goes bankrupt. In this way, investors take higher debt levels as a signal of higher quality.

An alternative signalling approach proposed by Leland and Pyle (1977) is based on managerial risk aversion. They propose that managers are naturally risk-averse and will only hold or increase their share of firm equity if they believe that the return from doing so outweighs the increased risk of their portfolio due to risky equity. A manager's willingness to invest is seen as a positive signal of future projects, and is interpreted by the market as a signal of quality. Although the manager incurs a welfare loss by investing more than is optimal in a project, this is offset by a greater return for managers in high quality firms. Additionally, as higher levels of leverage allow managers to retain a larger fraction of equity, use of more debt can signal firm quality. As with Ross (1977), this approach proposes a positive relationship between the level of leverage and firm value.

A further theory based on information asymmetries is the market timing model proposed by Baker and Wurgler (2002). They propose that firms attempt to time the

market by issuing equity when their market values are high relative to book and past market values, issuing debt when they are not. Therefore, the resultant capital structure reflects the cumulative result of past attempts to time the market and is strongly related to historical market share values. Alti (2006) reports support for the market timing theory in the short run, but finds that its long run effects are limited. Thus, in common with aforementioned approaches, whilst the theory is intuitively appealing, it is not conclusively supported by empirical evidence.

B.6 Application of Asymmetric Information and Signalling Theories to the Sme Sector

There are two contrasting views in the literature on the source of information asymmetries in SME finance markets. One school of thought contends that external suppliers of finance have superior information on the value of a firm's investment projects and prospects for survival, and therefore the SME bears the cost of information asymmetries (Garmaise 2001). This view is supported by studies detailing the entrepreneur's excessive optimism about business prospects (Cooper et al. 1988), and the high non-survival rate among new firms (Audretsch 1991; Cressy 2006b). Additionally, survival rates among bank-financed firms are higher than those among owner-financed firms (Reid 1991), indicating that financial institutions are more skilled than insiders in appraising a firm's chances of survival, particularly in nascent and start-up firms. Berger and Udell (1990) state that banks have adequate information to appraise a project and "sort-by-observed-risk" by requiring more risky projects to provide collateral, whereas less risky projects are not required to do so.

The contrasting view is that insiders have greater knowledge about a firm's investment projects, and may take advantage of this superior information to the detriment of outsiders. Garmaise (2001) states that this view of information asymmetries is more appropriate for established firms, which have a preference for the pecking order of financing (Myers 1984; Myers and Majluf 1984). According to the Berger and Udell (1990) paradigm, this view corresponds with the traditional approach of banks, and thus they "sort-by-private-information" by requiring collateral to protect against default in the event of project failure.

The latter view emphasises the lack of opacity in SME financing, which is exacerbated by the relatively high cost of compiling information on individual firms, the limited and fragmented market for this information, and difficulties in signalling to the market. Application of the pecking order theory to SME financing contends that increased information opacity in SMEs results in investments being funded by inside equity, including the firm owner's funds, as he has superior information on the firm. Small firm owners thus try to meet their finance needs from a pecking order of, first, their "own" money (personal savings and retained earnings); second, short-term borrowings; third, longer term debt; and, least

preferred of all, from the introduction of new equity investors (Cosh and Hughes 1994). This means that small firms operate without targeting an optimal debt/equity ratio as suggested by the trade-off theory, and reveals a strong preference for financing options that minimise intrusion into their businesses. Following Myers (1984) and Myers and Majluf (1984), levels of debt reflect the cumulative need for external finance over time. Firms' debt ratios differ, reflecting variations in factors such as initial capitalisation, asset structure, profitability, and rates of retention.

Numerous studies report financing patterns consistent with the pecking order theory, including Chittenden et al. (1996), Cressy and Olofsson (1997b), Michaelas et al. (1999), Berggren et al. (2000), Coleman and Cohn (2000), Hall et al. (2000), Lopez-Gracia and Aybar-Arias (2000), Romano et al. (2001), Watson and Wilson (2002), Cassar and Holmes (2003), Ou and Haynes (2003), Cassar (2004), Hall et al. (2004), Voulgaris et al. (2004), Baeyens and Manigart (2005), Gregory et al. (2005), Johnsen and McMahon (2005), Sogorb Mira (2005), Ou and Haynes (2006), Daskalakis and Psillaki (2008), Mac an Bhaird and Lucey (2010). These studies emphasise that SMEs rely on internal equity and external borrowing to finance operations and growth, and only a very small number of firms employ external equity. A number of studies report that firms operate under a constrained pecking order, and do not even consider raising external equity (Holmes and Kent 1991; Howorth 2001). Other studies indicate that the financing preferences of SME owners adhere to a modified pecking order, such as the High Technology Pecking Order Hypothesis (HTPOH) (Oakey 1984; Brierley 2001; Hogan and Hutson 2005). This theory propounds that firms with a particular profile (high-technology firms with potential for high-growth rates) prefer to finance investment from internal equity, followed by external equity, and finally debt financing, and is supported by empirical evidence. In seeking to explain the apparent adherence of firms in the SME sector to the pecking order theory, the primary question is whether it is imposed by supply side factors, or if it is due to demand side choices.

One of the most frequently examined issues in SME financing addresses the supply of finance to the sector, and enquires whether there is a financing gap. Holmes and Kent (1991) describe the financing gap as having two components: a knowledge gap, whereby the firm owner has limited awareness of the appropriate sources of finance and the relative advantages and disadvantages of each source; and secondly, a supply gap, whereby funds are either unavailable to small firms, or the cost of debt to small firms exceeds the cost of debt to large firms. Authors in the field of economics and SME finance have concentrated on the latter, with two polarised views emerging. Stiglitz and Weiss (1981) present a model of credit rationing in markets with imperfect information in which "good" projects are denied funding because of credit rationing. This is viewed as an underinvestment problem, where equity clears the market. The opposing theory of De Meza and Webb (1987, 2000) proposes that the inability of lenders to discover risk characteristics of borrowers results in socially excessive levels of lending. Thus, the pooling of "good" projects with "poor" projects results in a lower interest rate charged to "poor" projects and credit rationing of "good" projects. The central issue concerns market efficiency. Many papers empirically investigate the subject of a financing

constraint in SMEs, both supporting (Fazzari et al. 1988, 2000) and refuting (Levenson and Willard 2000) the phenomenon. Intervention to alleviate funding gaps due to market inefficiencies, if they exist, or if intervention is the proper response, is a question that has been comprehensively discussed by academics, policy makers, and practitioners. Although evidence for a persistent equity gap is inconclusive, Cressy (2002) opines that governments across the globe will continue to intervene in SME capital markets because of political considerations.

An alternative approach to explaining the apparent adherence of SMEs to the pecking order theory concerns preferences of the firm owner, or demand-side issues. One reason for the observed hierarchy in financing patterns is the relatively higher cost of external equity for smaller firms. The process of raising capital through an Initial Public Offering of common stock (IPO) is more expensive per share for SMEs due to the fixed costs of due diligence, distribution, and securities registration (Berger and Udell 1998). Despite the reduced cost and lesser diligence requirements of obtaining a listing on markets specifically oriented towards smaller firms, such as the Irish Enterprise Exchange (IEX) or the Alternative Investment Market (AIM), it remains a very costly process. Additionally, empirical evidence suggests that the effect of underpricing is significantly more severe for smaller firms (Buckland and Davis 1990; Ibbotson et al. 2001). Whilst the combination of these costs is an impediment to stock market flotation, perhaps the greatest disincentive is the resultant loss of control due to wider equity ownership.

The latter factor, along with the interrelated issue of managerial independence, is commonly cited as the primary reason for adherence of SMEs to the pecking order theory of financing (Bolton Committee 1971; Cosh and Hughes 1994; Chittenden et al. 1996; Jordan et al. 1998). A number of studies report that desire for independence is so great, SME owners eschew growth opportunities rather than relinquish control (Cressy and Olofsson 1997b; Michaelas et al. 1998). This prevents firm growth and increases in the number of employees (Berggren et al. 2000), and has wider implications in restricting economic growth. Empirical evidence suggests that desire to retain control and maintain managerial independence varies with ownership structure and firm profile. Poutziouris (2002) finds that aversion to external equity is more evident in family owned firms, partly because of succession considerations. Further studies report that reluctance to employ external equity from new investors is dependent on sector, finding that owners of firms in the high-technology sector are willing to cede control in return for equity capital (Oakey 1984; Hogan and Hutson 2005). Moreover, willingness to employ external equity may be contingent on added capabilities of the equity provider. For example, firm owners are willing to employ external equity from new investors in return for managerial input and non financial competencies (Cressy and Olofsson 1997b; Giudici and Paleari 2000; De Bettignies and Brander 2007).

A number of authors in the corporate finance literature propose that firms overcome potential information asymmetry problems by signalling to the financial markets through issuing debt or equity. Notwithstanding fundamental differences in the nature of public debt and equity markets and the private debt and equity markets typically accessed by SMEs, researchers assert that SMEs overcome information

opacity by signalling to funders. Bester (1985) and Besanko and Thakor (1987) state that provision of personal assets by the firm owner as collateral for business loans may be interpreted as having a signalling function. Conversely, Coco (2000) and Manove et al. (2001), state that collateral is used by financial institutions to protect against credit exposure, rather than as a signalling mechanism. This view is supported by Hanley and Crook (2005, p. 417), finding that "... the 'menu approach' that underpins signalling models as lacking in realism."

This evidence does not completely reject the role of signalling in SME financing, however. A number of studies find that funders' willingness to provide finance to SMEs is positively related with the financial commitment of the firm owner to the venture, particularly the amount of personal finance invested by a firm owner (Storey 1994a; Blumberg and Letterie 2008). These studies report that the amount of equity invested by the firm owner in a venture is a signal of the owner's belief that the venture will succeed, and reduces the likelihood of incurring increased risk *ex post*. This view is consistent with the signalling approach based on managerial risk aversion propounded by Leland and Pyle (1977).

B.7 Agency Theory

Integrating theories of finance, agency, and property rights, Jensen and Meckling (1976) outline a nexus of relationships in publicly listed companies which could be characterised as principal-agent relationships. Firms' security holders (debtholders and equityholders) are seen as principals, and firms' management as agent, managing the principals' assets. The principal-agent relation may be costly, because if both are utility maximisers "...there is a possibility that the agent will not always conduct business in a way that is consistent with the best interest of the principals" (Jensen and Meckling 1976, p. 308). Jensen and Meckling identify three implicit costs that may result from such relationships; monitoring costs incurred by the principal, bonding costs incurred by the agent, and a "residual loss." The principal incurs monitoring costs to ensure the agent acts in the principal's best interest, limiting the agent's unrepresentative activities. The agent incurs bonding costs by guaranteeing that he will make choices to maximise the principal's welfare. The "residual loss" is borne by the principal, because despite monitoring and bonding costs, it is not always possible to ensure the agent operates in a way which maximises the welfare of the principal.

Conflicts between debtholders and equityholders arise because of the nature of debt contracts, resulting in the unequal distribution of payoffs from an investment project. If an investment yields high returns, debtholders receive a fixed interest payment whilst equityholders capture most of the gains. However, if the investment fails, debtholders bear the full amount of the losses because of limited liability. Therefore, once debtholders have advanced capital to equityholders, the latter have an incentive to take on riskier projects than intended by the debtholders. If the riskier project succeeds, equityholders capture most of the gains, but if the project

fails they default and the debtholders incur the losses. This effect is known as the "asset substitution effect," and is a consequence of moral hazard in loan agreements. Debtholders attempt to overcome this moral hazard and limit equityholders' ability to expropriate wealth by incorporating protective covenants and monitoring devices into debt agreements.

Another conflict of interest identified by Jensen and Meckling (1976) exists between managers and equityholders in firms in which managers hold less than 100% of the residual claim of the firm. If a single individual owns a firm, the owner-manager bears all the costs and realises all the benefits of his actions, and he will make operational decisions to maximise his utility. As the manager's ownership stake in the firm decreases, he has an incentive to act for his own benefit, rather than in the best interests of equityholders. Rather than endeavouring to maximise firm value, the manager may consume extra perquisites or seek to expand the scale of the firm beyond its optimal scale.

As both debt and external equity incur agency costs, there is an optimal debt-equity ratio at which agency costs are minimised. Potential agency costs related to equity financing are at a maximum when the owner-manager has no equity holding. Conversely, these costs fall to zero when the owner-manager owns 100% of the equity of the firm. Potential agency costs related to debt financing are positively related to the proportion of debt employed in the capital structure of the firm; as leverage levels fall, potential agency costs decrease. Therefore, the agency cost curve of the firm is a concave or U-shaped function of the ratio of debt to external equity. The optimal ratio of debt to external equity is that point at which agency costs are minimised.

Empirical evidence supports theoretical agency models predicting positive relationships between leverage and firm value (Harris and Raviv 1990), and leverage and a lack of growth opportunities (Stulz 1990). By contrast, recent papers based on survey evidence do not support agency theory (Graham and Harvey 2001; Brav et al. 2005). In conclusion, although economic problems of agency costs are apparent in financing tactics (Myers 2001), empirical evidence from the corporate finance literature does not support a general explanation of financing based on agency theory.

B.8 Application of Agency Theory to the SME Sector

The effect of agency costs is likely to be more significant if businesses are small (Hand et al. 1982), as agency problems are more pronounced when information asymmetries are greater, and when the agent has an incentive to engage in high risk activities at the expense of funders (Barnea et al. 1981). Unique characteristics of SMEs increase the potential for agency costs, and introduce new types of agency problems. These features include: "alternative organisational forms, absence of publicly traded shares, risk taking tendency of entrepreneurs, limited personal wealth of firm owners and shortened expected duration for the firm" (Ang 1991, p. 4),

"conflicts in perception regarding the intentions of the entrepreneur, the heightened probability of failure, and credibility of commitments and signals made by owners with limited wealth holdings" (Keasey and Watson 1993, p. 41). Additionally, agency costs are not constant across all firms. Potential agency costs increase with intangibility of assets, as growth options increase and asset specificity rises (Gompers 1995). Furthermore, incentives and opportunities for the owner-manager to gamble with outside investors' claims are greatly enhanced when the firm becomes financially distressed (Keasey and Watson 1993).

Application of agency theory to the SME sector has spawned a vast literature, focussing on the relationship between firm owners and suppliers of external capital. Potential conflicts that may arise between firm owners and providers of debt are different from those that may arise between firm owners and providers of equity, as are the techniques employed to counteract potential agency problems. Suppliers of private equity seek to minimise possible agency problems by employing a number of techniques at frequent stages in the investment process. At the outset, venture capitalists conduct an extensive due diligence process before investing in a company (Manigart et al. 1997). When investing capital, suppliers of private equity employ a number of control mechanisms throughout the investment process. Three methods common to venture capital providers include; use of convertible securities, syndication of investment, and staging capital investment (Gompers 1995). Sahlman (1990) states that the staging of capital investment is the most effective control mechanism a venture capitalist can employ. Shorter duration between funding rounds increases the effectiveness in monitoring the firm. Intensity of monitoring is negatively related to expected agency costs, and the venture capitalist always retains the ultimate answer to agency problems – ". . . abandonment of the project" (Gompers 1995, p. 1462).

Whilst private equity is an important source of capital for a limited number of SMEs, debt is by far the most commonly used source of external capital (Binks and Ennew 1998; Cole 2008). Vos and Forlong (1996) report that, as agency costs of debt are negatively related with size, potential costs are greater in the SME sector than in the corporate sector. This is partly attributable to the well documented fact that reliable information on SMEs is rare and costly to obtain for financial intermediaries (Baas and Schrooten 2006). Potential problems arising from agency relationships with debt providers consist of moral hazard and adverse selection. Adverse selection arises at loan origination when providers of debt have difficulty in discriminating between "good" and "bad" investment projects, resulting in financing constraints for small businesses. A number of studies emphasise potential problems of adverse selection for the SME sector (Stiglitz and Weiss 1981; Berger and Udell 1998; Hyytinen and Vaananen 2006). A demand-side consequence of adverse selection for SMEs is that borrowers may be reluctant to apply for loans in the belief that their application will be rejected. Kon and Storey (2003) show that the scale of discouragement depends on, among other things, screening error of banks and the scale of application costs.

Moral hazard refers to the possibility of the SME owner changing his behaviour to the detriment of the debt provider after credit has been granted. The firm owner

has an incentive to alter his behaviour *ex post* by favouring projects with higher returns and greater risk. Debt providers seek to minimise agency costs arising from these relationships by employing a number of lending techniques. Baas and Schrooten (2006) propose a classification of four lending techniques: asset-based lending, financial statement lending, small business credit scoring lending (transactions-based or "hard" techniques); and relationship lending (a "soft" technique). An alternative classification by Berry et al. (2004) identifies two approaches to lending: the "gone concern" approach, and the "going concern" approach, which are comparable to Baas and Schrooten's (2006) "hard" and "soft" techniques respectively. These techniques are considered in the following sections, particularly those most frequently employed; asset-based and relationship lending.

Asset-based lending: Lending to SMEs by financial institutions is frequently "collateral-based" (Kon and Storey 2003, p. 45), and firms report that lack of security offered is the primary reason cited for refusal of a term loan (Cruickshank 2000; Basu and Parker 2001; Ayadi 2008). Empirical evidence from a number of countries indicates the pervasiveness in use of asset-based techniques to advance debt. For example, Black et al. (1996) find that ratio of loan size to collateral exceeds unity for 85% of small business loans in the UK, and Berger and Udell (1990) report that over 70% of all loans to SMEs are collateralised.

Provision of collateral fulfils a number of roles; it provides an asset for the bank in the event of project failure (Bartholdy and Mateus 2008); it provides an incentive for commitment to the entrepreneur and attenuates moral hazard (Boot et al. 1991); it provides a signal to the bank that the entrepreneur believes the project will succeed (Storey 1994a); it mitigates information asymmetries, and thus may alleviate imperfections in credit markets, which may reduce credit rationing (Besanko and Thakor 1987); it may also help in the renegotiation of loans under financial distress (Gorton and Kahn 2000). The requirement of banks for collateral to secure debt is motivated solely by the need to be compensated for *ex post* changes in their exposure to risk (Keasey and Watson 1993). The collateralised lender has a claim on specific assets of the principal in the event of the borrower becoming bankrupt (Rajan and Winton 1995). Therefore, the expected profit function for the bank is:

$$E\left(\prod\right)^{B} = p[K(1+i)] - (1-p)[C - K(1+r)]$$

K = loan amount
C = collateral
P = probability of success

where the bank still obtains collateral of value C, less the income which could have been obtained from the investment (Storey 1994b, p. 209).

A unique feature of SME debt markets is the personal commitment of the firm owner in securing business loans. Empirical evidence indicates that personal guarantees and provision of personal assets as collateral are important for firms seeking to secure business loans (Ang et al. 1995; Avery et al. 1998). These

commitments are akin to quasi-equity, but as they are not recorded in the business financial statement the owner's contribution to the firm is underestimated (Ang 1992). Pledging "outside" collateral may be even more effective in countering problems of moral hazard, as the firm owner may place a greater value on the asset than the market valuation. Additionally,

> Willingness to put your own money into a venture is a pretty effective test of its worth and a high personal stake is a powerful incentive to good stewardship
>
> (Black et al. 1996, p. 73).

Liquidation of personal assets causes a net welfare loss (Coco 2000), and results in disutility to the firm owner. The borrower's risk preference incentives are limited as the likelihood increases that he will feel the loss personally (Mann 1997b), even if personal commitments represent ". . .only a small fraction of the value of the loan" (Berger and Udell 2006, p. 639).

An important aspect of the collateral-based lending technique is enforceability of the lender's collateral claims in the event of default, as the power of collateral ultimately depends on whether the priority rights of lenders are upheld in bankruptcy (Berger and Udell 2006). This is especially important in terms of alleviating problems related to adverse selection. Beck et al. (2004) report that better protection of property rights has a relatively greater effect on, and increases external financing to smaller firms. Problems in enforcing collateral rights are more prevalent in countries with underdeveloped financial infrastructures, compelling SMEs to rely on leasing, supplier credit, and development banks (Beck and Demirguc-Kunt 2006).

A major disadvantage of asset-based lending techniques are monitoring and legal costs (Chan and Kanatas 1985). Additionally, assets provided as collateral must be of sufficient quality and quantity to support the loan (Berger and Udell 1995). An associated issue for lending institutions concerns the issue of valuation of collateral, which may change over time. Probably the greatest disadvantage of asset-based lending techniques is that they do not fully overcome problems of moral hazard and adverse selection, because not all firm owners have equal access to collateral (Storey 1994b). This is especially true for high-technology start-ups and capital-intensive projects where the loans required are typically large (Storey 1994b; Ullah and Taylor 2005). Because of these drawbacks, Baas and Schrooten (2006) contend that the asset-based lending technique is generally used as a substitute for relationship lending if the term of the relationship is short.

Relationship lending: Relationship lending is based on "soft" information generated by a bank's experience with a lender (Baas and Schrooten 2006) through "continuous contact with the firm and the firm owner in the provision of financial services" (Berger and Udell 1998, p. 645). As a firm becomes established and develops a trading and credit history, reputation effects alleviate the problem of moral hazard (Diamond 1989), facilitating borrowing capacity. Studies emphasise the importance of relationship lending in funding SMEs (Berger and Udell 1995; Cole 1998), and Hanley and Crook (2005) state that a pre-existing reputation is the

single most important determinant in inducing a bank to extend a loan. A substantial volume of empirical evidence suggests additional benefits of relationship lending, including lower interest rates (Berger and Udell 1995; Keasey and Watson 2000), lower collateral requirements (Harhoff and Korting 1998; Elsas and Krahnen 1998), access to increased amounts of finance, and protection against credit crunches (Berger and Udell 1998). The importance of lending relationships for provision of finance to the sector is emphasised by studies highlighting the destructive effects on relationship lending of the consolidation of the banking sector through mergers (Cole 1998; Berger and Udell 2002), making it too costly for banks to provide relationship-based services (Berger and Udell 1998); and by resultant changing practices within banks, such as making lending decisions centrally (Berger and Udell 2006).

Further techniques to reduce agency: Additional lending techniques employed by financial institutions to advance debt finance to informationally opaque small firms include financial statement lending and credit scoring. Financial statement techniques entail basing the lending decision on financial statements of the firm. The decision to provide debt finance is thus dependent on the strength of the balance sheet and income statements of applicants (Baas and Schrooten 2006). Credit scoring lending techniques augment data provided in financial statements with additional information, such as the creditworthiness and financial history of the firm owner, to predict probability of repayment (Frame et al. 2001). The effectiveness of this technique is based on the quality of available data (Baas and Schrooten 2006). These latter approaches require more analytical skills and monitoring than asset-based lending approaches (Berger and Udell 1998), and are more costly to administer. Berry et al. (2004, p. 118) conclude that the approach adopted by lending institutions "...varies from case to case," and ultimately depends on the availability and cost of acquiring information.

Recent developments in recommendations on banking laws and regulations issued by the Basel Committee on Banking Supervision, otherwise known as the Basel II Accord, may have implications for lending to the SME sector (Ayadi 2008). The agreement proposes adoption of more risk-sensitive minimum capital requirements for banks. Financial institutions may therefore attach more attention to the relative riskiness of borrowers, and will require more information than heretofore. This will place greater reporting and disclosure requirements on SMEs, although "safer" firms may benefit from lower interest rates and greater access to loans. Smaller, riskier SMEs may face greater difficulty in sourcing debt finance, higher interest rates, and greater collateral requirements (Tanaka 2003).

The foregoing discussion indicates that agency issues have a significant influence on access to, and use of, finance for SMEs. Techniques employed by principals to overcome potential agency costs, particularly problems of moral hazard, determine the source and amount of finance employed. Evidently, particular firm and owner characteristics are important in fulfilling the requirements of funders and securing finance. Empirical evidence from previous studies on the influence of firm and owner characteristics in overcoming agency related problems are considered in the following section.

B.9 Empirical Evidence of Determinants of SME Capital Structure

As evidenced from the foregoing analysis of capital structure literature, empirical research on SME financing has lagged that of the corporate sector. A proliferation of studies in recent years has remedied this deficit somewhat. The majority of research investigating SME financing consists of empirical tests of theoretically derived hypotheses. These studies are now considered in assessing accumulated empirical evidence on SME financing.

Early academic studies investigating the financing of SMEs comprise predominantly descriptive work, reporting differences between financial structures of small firms and larger corporations (Norton 1990; Ang 1991). As the literature developed, authors investigated theoretical explanations for SME capital structures. These works commonly tested theoretically derived models on panel data, typically employing regression techniques (Hall et al. 2004; Voulgaris et al. 2004; López-Gracia and Sogorb-Mira 2008; Heyman et al. 2008; Daskalakis and Psillaki 2008). A summary of a number of previous studies is presented in Table B.9 at the end of this appendix, detailing the author, country, sample size, method of analysis, theoretical perspective, and principal findings. Consistencies in results from a number of papers support similar theoretical explanations for SME capital structure, although a significant number of issues remain unresolved.

The synopsis of previous research detailed in Table B.9 indicates that previous studies can generally be categorised as "firm characteristic" or "owner characteristic" studies, depending on the level of analysis. A number of studies employ a multi-level approach, combining firm and owner characteristics. These approaches differ substantially with respect to the means of data collection, methods of analysis employed, and presentation of findings. The majority of "firm characteristic" studies adopt the positivist approach applied in corporate finance, developing and testing multivariate regression models utilising panel data. This data is generally sourced from secondary sources; for example, Hall et al. (2004) utilise panel data from the Dun and Bradstreet database. These studies seek to explain dependent variables, commonly debt ratios, in terms of firm characteristics such as firm size, age, asset structure, profitability, growth opportunities, and legal organisation. Additionally, differences in capital structures across industry sectors are commonly investigated (Mac an Bhaird and Lucey 2010).

What may be termed "owner characteristic" studies seek to explain firm financing in terms of firm owners' objectives and preferences, such as; desire to retain control and independence, propensity for risk taking, personal values, business goals and objectives, and other personal characteristics. Data employed in these studies is commonly obtained from interviews or questionnaire surveys specifically designed for this purpose (Jordan et al. 1998). These studies typically comprise smaller samples with fewer observations, and data is generally analysed employing descriptive techniques (Michaelas et al. 1998; Poutziouris 2003).

In seeking to discover more complete explanations for SME capital structures, a number of researchers combine both levels of analysis. These studies typically collect data on owner and firm characteristics employing questionnaire surveys. A variety of statistical techniques are employed to analyse data, including structural equation modelling (Romano et al. 2001) and multivariate regression methods (Jordan et al. 1998). Empirical evidence from each of these approaches is considered in the following sections.

B.10 "Firm Characteristic" Studies

Similar to the approach adopted in corporate finance, "firm characteristic" studies investigate the extent to which debt ratios are determined by firm characteristics, including firm size, age, asset structure, profitability, growth opportunities, and industry sector. These studies commonly employ short-term, long-term, and total debt ratios as dependent variables (López-Gracia and Sogorb-Mira 2008). Despite being the most important source of investment finance for SMEs, studies employing internal equity as the dependent variable are rare (Ou and Haynes 2006). "Firm characteristic" studies are commonly representative of a broad range of sectors, and sample sizes are typically large. For example, Sogorb Mira (2005) and Hall et al. (2004) employ samples comprising 6,482 and 4,000 firms respectively. Notwithstanding significant inter- and intra-industry differences, a number of consistent results have emerged, some of which are discussed in the following paragraphs. Discussion is arranged around a number of firm characteristics which commonly feature as independent variables in models tested, and which are pertinent for the present study.

Firm size: Researchers advance the argument that larger firms should find it easier to raise debt finance than smaller firms, due to lower bankruptcy costs, lower agency costs, and relatively lower costs of resolving information asymmetries (Cassar 2004). Firm size can be defined in a number of ways, and previous studies employ various variables to proxy for size, including number of employees (Berggren et al. 2000), natural logarithm of asset size (Cassar and Holmes 2003), and sales turnover (Ou and Haynes 2003), depending on the information available. Empirical evidence presented in Table B.1 indicates a positive relationship between long-term debt and size for all studies, regardless of the proxy used for firm size. These findings are consistent with the view that smaller firms are offered, and employ less debt due to scale effects (Cassar and Holmes 2003). A further reason for observed positive relationships may be collateral effects, as the natural logarithm of total assets is commonly employed as a proxy variable for size. Firms with a greater amount of collateralisable assets have capacity for higher long-term debt ratios *ceteris paribus*, and tend to match maturity of debt with that of assets (Bartholdy and Mateus 2008).

The negative relationship between use of short-term debt and size reported in most studies is consistent with the view that smaller firms are heavily reliant on

Table B.1 Results from previous studies concerning the relationship between debt financing and firm size

	Short-term debt	Long-term debt	Total debt	Sample size (Country)
Chittenden et al. (1996)	−	+	n.s.s.	3,480 (UK)
Michaelas et al. (1999)	−	+	+	3,500 (UK)
Coleman and Cohn (2000)			+	4,637 (USA)
Hall et al. (2000)	−	+		3,500 (UK)
Esperanca et al. (2003)	−	+	−	995 (Portugal)
Cassar and Holmes (2003)	n.s.s.	+	+	1,555 (Australia)
Voulgaris et al. (2004)	+	+	+	132 (Greece)
Hall et al. (2004)	−	+		4,000 (eight countries)
Sogorb Mira (2005)	n.s.s.	+	+	6,482 (Spain)
Ghosh (2007)			+	1,141 (India)
Heyman et al. (2008)			−	1,132 (Belgium)
Daskalakis and Psillaki (2008)			+	3,258 (France and Greece)
López-Gracia and Sogorb-Mira (2008)			+	3,569 (Spain)
Bartholdy and Mateus (2008)	n.s.s.	+		1,416 (Portugal)
Mac an Bhaird and Lucey (2010)	n.s.s.	+		299 (Ireland)

n.s.s. = not statistically significant at the 95% level of confidence

short-term debt (Garcia-Teruel and Martinez-Solano 2007). This relationship may result from firms being unwilling or unable to employ long-term debt because of relatively higher transaction costs, thus having a greater reliance on short-term debt. The relationship between total debt and firm size is positive for most studies, notwithstanding potential confounding opposite effects of short-term and long-term debt (Hall et al. 2000). These findings indicate that larger firms have relatively lower costs in overcoming information asymmetries (Cassar and Holmes 2003), and thus have a greater capacity to employ higher debt ratios. Furthermore, larger firms, as defined by asset size, have a relatively greater capacity for debt financing, *ceteris paribus*.

Firm age: Firm age is the fundamental variable in financial growth life cycle models, and is central to capital structure theories. Firm age may be employed as a proxy variable in consideration of agency theory. Theoretical propositions suggest that firms gain access to increased amounts of external financing as they mature and develop a reputation, which lessens potential problems of moral hazard (Diamond 1989). Lenders are thus more likely to advance credit facilities based on previous transactions (Cole 1998). Additionally, firm age may be employed as an independent variable in testing propositions of pecking order theory. Theoretically, firms become less reliant on sources of external funding over time as debt is retired and firms become increasingly dependent on retained profits (Myers and Majluf 1984; Myers 1984). Empirical evidence from previous studies indicates that debt (both short-term and long-term) is negatively related with age (Table B.2).

These findings indicate a pattern of financing consistent with the pecking order theory, i.e. increased use of retained profits for investment projects as debt is retired

Table B.2 Results from previous studies concerning the relationship between debt financing and firm age

	Short-term debt	Long-term debt	Total debt	Sample size (Country)
Chittenden et al. (1996)	−	n.s.s.	−	3,480 (UK)
Michaelas et al. (1999)	−	−	−	3,500 (UK)
Coleman and Cohn (2000)			−	4,637 (USA)
Hall et al. (2000)	−	−		3,500 (UK)
Esperanca et al. (2003)	n.s.s.	−	n.s.s.	995 (Portugal)
Hall et al. (2004)	−	n.s.s		4,000 (eight countries)
Johnsen and McMahon (2005)	−	+	−	9,731 (Australia)
López-Gracia and Sogorb-Mira (2008)			−	3,569 (Spain)
Bartholdy and Mateus (2008)	n.s.s.	−		1,416 (Portugal)
Mac an Bhaird and Lucey (2010)	n.s.s.	−		299 (Ireland)

n.s.s. = not statistically significant at the 95% level of confidence

over time. Additionally, a number of studies emphasise that the relationship between source of finance and age is more complex, in particular that patterns of financing over time are not necessarily linear. Researchers investigate non-linearity by including squared or cubed independent variables to test quadratic and cubic functions (Fluck et al. 1998). These models constitute a more sophisticated investigation of firm financing, surmounting the assumption of linearity in financial growth life cycle models.

Profitability: Trade-off and pecking order theories predict contrasting relationships between profitability and use of debt. Trade-off theory espouses a positive relationship between profitability and use of debt, in order to reduce tax liability. The pecking order theory propounds that debt is the preferred source of finance for positive NPV projects when sources of internal equity are exhausted, suggesting a negative relationship between profitability and debt. The direction of the coefficient for an independent profitability variable should therefore indicate which theory has greater relevance to SME financing.

Coefficients for the relationship between debt and profitability in previous studies are typically negative, as evidenced by results presented in Table B.3. These relationships indicate that firms employ debt finance when retained profits are insufficient for investment requirements, suggesting that debt is a direct substitute for retained profits. Results imply that firms are financed in a manner consistent with the pecking order theory (Myers 1984; Myers and Majluf 1984), with retained profits the preferred source of financing for positive NPV projects. This finding emphasises the importance of profitability in financing the sector, as retained profits are the single most important source of finance for SMEs (Ou and Haynes 2006; Cole 2008).

Asset structure: Firms' asset structures may have a significant influence on the means of external finance employed, primarily because financial institutions employ asset-based lending techniques when advancing debt to overcome potential agency problems of moral hazard. Long-term debt and mortgages are typically secured on fixed assets, whilst short-term debt is commonly advanced subject to

Table B.3 Results from previous studies concerning the relationship between debt financing and profitability

	Short-term debt	Long-term debt	Total debt	Sample size (Country)
Chittenden et al. (1996)	−	n.s.s.	−	3,480 (UK)
Michaelas et al. (1999)	−	−	−	3,500 (UK)
Hall et al. (2000)	−	n.s.s.		3,500 (UK)
Esperanca et al. (2003)	−	−	−	995 (Portugal)
Voulgaris et al. (2004)	−		−	132 (Greece)
Hall et al. (2004)	−	n.s.s.		4,000 (eight countries)
Sogorb Mira (2005)	−	−	−	6,482 (Spain)
Heyman et al. (2008)			−	1,132 (Belgium)
Daskalakis and Psillaki (2008)			−	3,258 (France and Greece)
López-Gracia and Sogorb-Mira (2008)			−	3,569 (Spain)
Bartholdy and Mateus (2008)	−	n.s.s.		1,416 (Portugal)

n.s.s. = not statistically significant at the 95% level of confidence

Table B.4 Results from previous studies concerning the relationship between debt financing and tangible assets

	Short-term debt	Long-term debt	Total debt	Sample size (Country)
Chittenden et al. (1996)	−	+	−	3,480 (UK)
Michaelas et al. (1999)	+	+	+	3,500 (UK)
Hall et al. (2000)	−	+		3,500 (UK)
Cassar and Holmes (2003)	−	+	−	1,555 (Australia)
Esperanca et al. (2003)	−	+	−	995 (Portugal)
Hall et al. (2004)	−	+		4,000 (eight countries)
Sogorb Mira (2005)	−	+	+	6,482 (Spain)
Voulgaris et al. (2004)	+	+		132 (Greece)
Johnsen and McMahon (2005)	−	+	−	9,731 (Australia)
Heyman et al. (2008)			+	1,132 (Belgium)
Daskalakis and Psillaki (2008)			−	3,258 (France and Greece)
Bartholdy and Mateus (2008)		+		1,416 (Portugal)
Mac an Bhaird and Lucey (2010)	+	+	+	299 (Ireland)

provision of collateral in the form of current assets, such as debtors or inventory (Coco 2000; Ayadi 2008). Collateral provides funders with security in the event of default, with maturity of the asset typically matching maturity of the debt (Bartholdy and Mateus 2008).

Empirical evidence from all previous studies presented in Table B.4 indicates a positive relationship between use of long-term debt and asset structure, (with the ratio of fixed assets to total assets commonly employed as a proxy variable for asset structure). These findings support the proposition of Bartholdy and Mateus (2008), that asset structure is the single most important determinant of SME capital

structures. Results for the majority of studies presented in Table B.4 reveal a negative relationship between short-term debt and fixed assets. These findings suggest that firms' short-term debt is not secured on fixed assets, either because of insufficient fixed assets, or because it is secured on other (short-term) collateral, or unsecured. The implication in the former case is that firms employ inappropriate sources of finance (short-term rather than long-term debt) due to insufficient lien-free collateralisable fixed assets.

Evidence from previous studies is not unanimous, however. Positive relationships between short-term debt and fixed assets reported by Voulgaris et al. (2004) and Mac an Bhaird and Lucey (2010) indicate that financial institutions' collateral requirements are met by fixed assets when advancing short-term debt. This evidence suggests that firms have adequate collateral to secure debt finance, but have a preference for short-term debt.

Results provide empirical evidence of the use of asset-based lending techniques by financial institutions to overcome information asymmetries and potential agency costs, with both short- and long-term debt requiring security. These findings suggest that firms with high levels of collateralisable assets have a greater capacity for debt financing, whilst firms lacking these assets may be debt constrained.

These results suggest inter-industry differences in capital structures, as firms in industries typified by greater levels of collateralisable assets have the capacity for, and may employ, greater levels of debt than firms with a higher concentration of intangible assets (Brierley and Kearns 2001). Indeed, intra-industry capital structures may be more comparable than inter-industry capital structures (Harris and Raviv 1991). Previous empirical investigations of inter-industry differences in capital structures typically included industry dummy variables in regression models. Empirical evidence of sectoral effects is mixed, with studies both supporting (Michaelas et al. 1999; Hall et al. 2000) and failing to support this hypothesis. Examples of the latter include Balakrishnan and Fox (1993) who conclude that firm specific characteristics are more important than structural characteristics of industry, and Jordan et al. (1998) who find that financial and strategy variables have greater explanatory power than industry specific effects.

Growth: Previous studies propose that growth, particularly high growth, is positively related to the proportion of external financing employed (Gompers and Lerner 2003). Proxy variables commonly employed for growth include the percentage increase in recent sales turnover, or percentage increase in level of total assets. High-growth firms typically have a large external financing requirement (Storey 1994b). Firms with sufficient lien-free collateralisable assets may have access to debt financing, although potential agency costs may result in a financing restraint for some firms. This is especially true for firms investing in firm specific, or intangible assets (Myers 1977). Hall et al. (2000) state that this agency problem can be alleviated by the use of short-term instead of long-term debt, thus hypothesising a positive relationship between growth and short-term debt.

Results from previous studies presented in Table B.5 provide support for this hypothesis. One exception is the finding of Sogorb Mira (2005), who explains that the type of assets linked to growth opportunities may be long-term in nature, and

Table B.5 Results from previous studies concerning the relationship between financing and growth

	Short-term debt	Long-term debt	Total debt	Sample size (Country)
Chittenden et al. (1996)	n.s.s.	n.s.s.	n.s.s.	3,480 (UK)
Michaelas et al. (1999)	+	+	+	3,500 (UK)
Hall et al. (2000)	+	n.s.s.		3,500 (UK)
Cassar and Holmes (2003)	+	n.s.s.	+	1,555 (Australia)
Esperanca et al. (2003)	+	n.s.s.	+	995 (Portugal)
Voulgaris et al. (2004)	+		+	132 (Greece)
Hall et al. (2004)	+	n.s.s.		4,000 (eight countries)
Johnsen and McMahon (2005)	+	+	+	9,731 (Australia)
Sogorb Mira (2005)	−	+	+	6,482 (Spain)
Daskalakis and Psillaki (2008)			+ (France)	3,258 (France and Greece)

n.s.s. = not statistically significant at the 95% level of confidence

Table B.6 Results from previous studies concerning the relationship between financing and tax-rate

	Short-term debt	Long-term debt	Total debt	Sample size (country)
Jordan et al. (1998)			−	173 (UK)
Michaelas et al. (1999)	n.s.s.	n.s.s.	n.s.s.	3,500 (UK)
Sogorb Mira (2005)	n.s.s	−	−	6,482 (Spain)
López-Gracia and Sogorb-Mira (2008)			n.s.s	3,569 (Spain)
Bartholdy and Mateus (2008)	+	n.s.s.		1,416 (Portugal)

n.s.s. = not statistically significant at the 95% level of confidence

thus the maturity of debt matches that of the assets. Significant findings from two other studies support this explanation. The positive relationship between total debt employed and growth supports the hypothesis that high-growth firms and firms investing in growth opportunities require additional external finance due to insufficient internal resources. Consistent with the pecking order theory, firms employ debt to finance this growth, particularly short-term debt.

Tax rate: Trade-off theory proposes that profitable firms should employ optimum levels of debt financing to take advantage of debt-tax shields (DeAngelo and Masulis 1980). A number of studies have empirically tested the relevance of this theory to SME financing by regressing debt ratios on the effective tax rate. Results presented in Table B.6 indicate that empirical evidence on the relevance of trade-off theory for SME financing is inconclusive. Jordan et al. (1998) and Sogorb Mira (2005) report a relationship contrary to predictions of trade-off theory. Both studies explain this negative relationship by the effect of the amount of tax paid on retained earnings, and consequently on the level of debt employed. Although Michaelas et al. (1999) find that tax rates do not significantly influence the level of debt in SMEs, they conclude that tax considerations may be important in the long term capital structure decision.

Non debt tax shields: Lack of empirical evidence indicating the relevance of tax advantages of debt may be partly explained by the significant negative relationships between debt and non-debt tax shields discovered in a number of studies (Michaelas et al. 1999; Sogorb Mira 2005; López-Gracia and Sogorb-Mira 2008). Use of non-debt tax shields lessens the importance of the debt-tax shield, and consequently the level of debt employed. By using non-debt tax shields such as investment credits or accelerated depreciation costs, firms seek to avoid distress costs or other adjustment costs which "... may be more important in particular instances" (López-Gracia and Sogorb-Mira 2008, p. 119). These results imply that firms with higher levels of tangible assets can maintain higher levels of debt, supporting the secured-debt view propounded by Smart et al. (2007) and Bartholdy and Mateus (2008).

Although combined results presented in Tables B.6 and B.7 suggest that non-debt tax shields are more important than debt-tax shields for SMEs, Michaelas et al. (1999), p. 120) conclude that "... It is hard to say that a firm's tax status has predictable material effects on its debt policy."

Operating risk: Given the importance of retained profits as a source of investment finance in SMEs (Cole 2008), it is hardly surprising that the coefficient of variation in profitability over the period studied is commonly used as a proxy for operating risk. Titman and Wessels (1988) propose that volatility of a firm's earnings is negatively related with its level of debt because of potential agency and bankruptcy costs. Results from previous studies presented in Table B.8 indicate that the opposite effect is true in SMEs, i.e. that the level of debt employed is positively related to operating risk as measured by volatility in earnings. These findings indicate that bankruptcy costs are not sufficiently large to deter risky SMEs from employing additional debt, particularly short-term debt. Furthermore, these results may indicate "distress" borrowing, particularly in adverse macroeconomic

Table B.7 Results from previous studies concerning the relationship between debt financing and non debt tax shields

	Short-term debt	Long-term debt	Total debt	Sample size (country)
Chittenden et al. (1996)				3,480 (U.K.)
Michaelas et al. (1999)	n.s.s.	−	n.s.s.	3,500 (U.K.)
Sogorb Mira (2005)	−	−	−	6,482 (Spain)
López-Gracia and Sogorb-Mira (2008)			−	3,569 (Spain)

n.s.s. = not statistically significant at the 95% level of confidence

Table B.8 Results from previous studies concerning the relationship between debt financing and operating risk

	Short-term debt	Long-term debt	Total debt	Sample size (country)
Jordan et al. (1998)			+	173 (UK)
Michaelas et al. (1999)	+	+	+	3,500 (UK)
Esperanca et al. (2003)	+	n.s.s.	+	995 (Portugal)

n.s.s. = not statistically significant at the 95% level of confidence

conditions (Jordan et al. 1998). A notable discovery in these studies is the difficulty in calculating an appropriate variable for bankruptcy costs.

In summary, a substantial body of evidence from empirical investigations of firm characteristic determinants of SME capital structures indicates a number of consistent results; for example, the positive relationship between debt finance and growth; the positive relationship between long-term debt and tangible assets; and the negative relationship between debt finance and profitability. There are also a number of conflicting results, however, such as relationships between short-term debt and firm size, and tangible assets. Notable features of previous studies are the lack of statistical significance, and the low explanatory power of a number of models, especially in models employing short-term debt as a dependent variable. These shortcomings prompt researchers to seek alternative explanations for SME financing, commonly employing a variety of methodologies.

B.11 "Owner Characteristic" Studies

The influence of firm owners' business goals, objectives, and preferences on SME financing is understated, as witnessed by the relative paucity of published papers employing this approach. Variables examined in previous studies investigating the influence of "owner characteristics" on a firm's capital structure may be delineated by two approaches; (1) a firm owner's personal characteristics, such as age, gender, race, education, and previous business experience, and (2) a firm owner's preferences, business goals, and motivations. Data for studies adopting these approaches are typically sourced from interviews and postal questionnaires, and are commonly analysed employing descriptive and non parametric techniques. Sample sizes are generally smaller than those in quantitative studies employing panel data, resulting in limitations to the generalisability of results.

A number of studies have examined the potential influence of personal characteristics of the firm owner on sources of financing employed. Personal characteristics investigated include, race (Scherr et al. 1993; Hussain and Matlay 2007; Salazar 2007), gender (Brush 1992; Carter and Rosa 1998; Boden and Nucci 2000; Coleman and Cohn 2000), tertiary education (Cassar 2004), age (Romano et al. 2001), and years of business experience (Coleman and Cohn 2000; Cassar 2004), amongst others. Whilst researchers generally do not find significant empirical evidence supporting the proposition that firm owners' personal characteristics determine the source of financing employed (Cassar 2004), some significant results have emerged. For example, Chaganti et al. (1995) find that women are more likely to employ internal than external equity; Romano et al. (2001) discover that older business owners are less likely to employ external equity; Scherr et al. (1993) find that owners' age is negatively related with debt, and also that more debt is obtained if the owner is married and less if he is black. Coleman and Cohn (2000) test if firm owners' age, education, years of experience, prior experience in a family-owned business, and gender influence the capital structure decision, and find education of

the firm owner to be the sole significant variable. In summary, although findings from previous studies suggest that personal characteristics of the firm owner may influence financing choice in SMEs, the bulk of empirical evidence indicates that these variables are not of primary importance (Carter and Rosa 1998).

Perhaps the single most important "owner characteristic" variable directly related to SME financing is personal wealth of the firm owner. Results from previous studies indicate that personal wealth of the entrepreneur influences the rate of business start-ups (Evans and Jovanovic 1989; Fairlie 1999). The level of wealth of the firm owner, and his willingness to invest personal equity and provide personal assets as collateral for business loans, is most important in the start-up and nascent stages (Berger and Udell 1998; Fluck et al. 1998; Ullah and Taylor 2007). Access to external financing is typically most difficult in early stage firms because of information opacity. Wealth constraints may contribute to the commonly experienced problem of undercapitalisation. The influence of wealth of the firm owner on capital structure is dependent on: (a) his propensity for risk, (b) his wealth relative to the capital requirements of the firm, and (c) availability of external sources of finance. The latter source may be dependent on the amount of personal equity the firm owner is willing to invest in the venture (Bruns and Fletcher 2008). Despite the importance of personal wealth of the firm owner to SME financing, empirical studies on the relative influence of this variable on the capital structure of SMEs are rare due to the sensitive nature of the data.

A further approach adopted in investigating capital structure in SMEs from the level of analysis of the firm owner is to examine the influence of firm owners' preferences, motivations, and business goals on firm financing. These studies seek to explain SME capital structures with reference to non-financial factors, including, desire for control, managerial independence, motivation for being in business, business goals, and propensity for risk (LeCornu et al. 1996; Michaelas et al. 1998; Jordan et al. 1998; Romano et al. 2001). Previous studies state that these factors may be more important than firm-characteristic factors in explaining SME financing (Barton and Matthews 1989; Norton 1990; Jordan et al. 1998), although one caveat of these studies is that they generally assume that firm owners have access to multiple sources of financing.

Firm owners' desire to retain control of the firm and maintain managerial independence is a defining characteristic of the SME sector (Bolton Committee 1971). This well-documented objective is frequently cited as the primary reason SME capital structures adhere to the pecking order theory of financing (Myers 1984; Myers and Majluf 1984), in particular the reluctance of SMEs to employ additional external equity (Berggren et al. 2000) or debt (Cressy 2006a). Retention of control of the firm is commonly dependent on firm owners' growth aspirations. Firms pursuing a growth strategy frequently require large amounts of additional external financing to augment internal resources (Gompers 1999). Empirical evidence indicates that firms with owners committed to retaining control are financed by internal equity (Holmes and Zimmer 1994), which may be augmented by short term bank debt (Storey 1994b). Lack of adequate finance from these sources may lead owners to eschew growth opportunities (Davidsson 1989), thus

maintaining control of the firm. Willingness to employ additional external equity is thus related to the motivation for growth and readiness to share equity (Berggren et al. 2000), although this is dependent on the attractiveness of the investment opportunity for outside investors (Storey 1994b).

Empirical evidence suggests that desire for control is not common across all SMEs, and varies according to ownership structure. Previous studies have shown that desire for control is greater in family firms, primarily for reasons of intergenerational transfer (Poutziouris 2002; Lopez-Gracia and Sanchez-Andujar 2007). The aspiration of retaining control may not be constant over the life cycle of the firm, however, and may change for reasons such as change of lifestyle or lack of a successor, for example. Fitzsimmons and Douglas (2006, p. 79) state that ". . .there may come a point where the stress and responsibility of decision making, coupled with the entrepreneur's realisation that he/she lacks critical market, industry or management information, causes the entrepreneur to switch from autonomy preference to autonomy aversion." In summary, empirical evidence from previous studies indicates that the strategic objective of maintaining control of the firm has a significant influence on the means of financing employed, although this goal is not constant across ownership structures.

A related issue examined in previous investigations of "owner characteristic" explanations for SME capital structures is the financial objective function of firm owners. Neo-classical finance theory propounds that the primary objective of the firm manager is maximisation of the value of the firm (Smart et al. 2007). In publicly quoted firms this is achieved by maximising the market price of common stock. Ownership of SMEs, by contrast, is typically closely held, and common stock is not publicly traded (Ang 1991). The goal of value maximisation in SMEs therefore manifests itself in a different way to that of publicly quoted companies. Cooley and Edwards (1983) suggest that the objective of "maximising the value of the selling price of the firm" is a suitable proxy for value maximisation in SMEs. This objective is not, however, consistent with maintaining control of the firm, and is more in keeping with the objective of equity holders aiming to harvest their investment. Empirical evidence from previous studies indicates that the primary financial objective of SME firm owners is not maximisation of the selling price of the firm (LeCornu et al. 1996). The primary objective of firm owners is maximisation of net income or net profit, and the secondary objective is to maximise growth of net income (Cooley and Edwards 1983; LeCornu et al. 1996). These financial objectives are consistent with maintaining control of the firm. Firm owners thus choose sources of finance commensurate with this objective, rather than sourcing finance for expansion or growth, which may lead to relinquishing control.

B.12 Conclusion

The theoretical foundation for empirical investigations of determinants of SME capital structures has been adopted from corporate finance, utilising theories based on agency, debt-tax shields, signalling, and information asymmetries. Results from

empirical studies in the SME literature confirm the relevance of these theoretical approaches to the sector, notwithstanding fundamental differences in ownership structure, financial objectives, and the nature of the financial markets accessed. Adopting the statistical methodology commonly employed in corporate finance studies, empirical studies in the SME literature test regression models on panel data consisting of detailed accounting information. Results from these studies reveal that firm characteristic variables such as firm age, size, asset structure, profitability, risk, and growth are significant determinants of capital structure. A common finding of previous empirical investigations is the considerable effect of information opacity on the financing of SMEs, highlighting the applicability of agency and information asymmetry theoretic approaches. Inconclusive evidence on the relationship between the marginal tax rate and leverage suggests that the trade-off theory has limited applicability to SME financing.

Investigating composition of capital structure at the level of analysis of the firm owner, results from previous studies detail the importance of firm owners' preferences, motivations, and business goals on the means of financing employed. These results substantiate the managerial or strategic perspective espoused by Barton and Matthews (1989) and Balakrishnan and Fox (1993), although few authors have empirically tested the managerial "strategic objective" approach (Jordan et al. 1998).

The foregoing consideration of previous capital structure empirical research highlights a number of gaps in the literature. Previous studies examining demand-side determinants of capital structure in SMEs have been dominated by the quantitative approach of the financial economics perspective. Whilst a number of SME financing characteristics may be explained by theoretical propositions of agency and pecking order theories, such as positive relationships between growth and use of debt finance, and between tangible assets and use of long term debt, for example; many unresolved issues remain. These unanswered questions may be profitably examined by considering a combination of both firm and owner levels of analysis.

Table B.9 Previous studies investigating SME financing

Author	Country (Sample size)	Method	Theoretical perspective	Principal findings
Studies adopting the "firm characteristic" approach				
Oakey (1984)	South-East England and Scottish Development Region (114)	Analysis of survey questions with chi-squared tests	Finance and innovation	74% of firms rely on internally generated profits Externally oriented firms are generally more innovative and progressive. In Scotland, newer high-tech small firms contribute to a higher incidence of external capital funding
Peterson and Schulman (1987)	12 countries (200)	Bivariate analysis of primary data (4,000 interviews)	Asymmetric Information. Agency theory	Life cycle of capital structure among small growing firms depends on age, size, and economic development of host country. Most firms initially dependent on personal funds and "f" connections, and over time are more able to rely on bank debt
Holmes and Kent (1991)	Australia (391)	Bivariate analysis on primary (questionnaire) data	Pecking order theory	Support for a constrained version of the pecking order theory. Where additional funds are sought, owners prefer "additional funds provided by owners" and debt
Davidson and Dutia (1991)	US (86,000)	General linear model Anova		Small firms are less liquid than large firms and have lower profit margins which may contribute to an undercapitalisation problem. Small firms use more short-term debt than large firms
Van der Wijst and Thurik (1993)	Former Western Germany (27)	Least squares dummy variable regression analysis of pooled cross-section and time series data	Debt-tax shield. Agency theory	Most of the determinants of financial structure presented by the theory of finance appear to be relevant for the small business sector investigated. Non-debt tax shields (approximated by depreciation) are the exception
Balakrishnan and Fox (1993)	US (295)	Random effects model	Debt-tax shield Agency theory Signalling	Firm specific effects contribute most to variance in leverage. Inter-industry differences are not nearly as important

(*continued*)

Table B.9 (continued)

Author	Country (Sample size)	Method	Theoretical perspective	Principal findings
Berger and Udell (1995)	US (3,400)	Ordinary least squares regression on cross-sectional panel data	Relationship lending	Borrowers with longer banking relationships pay lower interest rates and are less likely to provide collateral
Van Auken and Holman (1995)	US (190)	Canonical correlation analysis	Financial growth life cycle approach	Long-term assets are employed as collateral to secure long-term debt. Accounts payable and current debt are used to finance receivables and inventories
Chittenden et al. (1996)	UK (3,480)	Ordinary least squares regression on cross-sectional panel data	Life cycle model Pecking order theory Agency theory	Asset structure, profitability, size, age, and stock market flotation are significant determinants of capital structure. Financial structure reflects trade-offs of owner-managers. Collateral is important in securing debt. Short-term debt is negatively related to profitability
Vos and Forlong (1996)	New Zealand (35)	Spearman's rank analysis	Agency theory	Debt has a negative agency advantage in SMEs (decreases total utility of the firm owner due to loss of control, accountability, and increase in personal risk). Debt is only used when additional funds are necessary
Berger and Udell (1998)	US (1993 NSSBF data)[a]	Bivariate analysis of sources of finance by size and age	Pecking order theory Agency theory Financial growth life cycle model	The financial growth life cycle paradigm is depicted by categorising capital structures of SMEs by four sources of equity and nine sources of debt. Capital structure varies with firm size and age. Vulnerability of SME financing to the macroeconomic environment is highlighted
Fluck et al. (1998)	US (541)	Two-limit Tobit estimates	Reputation theory Monopoly lender theory	At the beginning of firms' life cycles, the proportion of funds from internal sources increases with age, whist the proportion from banks, venture capitalists, and private investors declines. These patterns eventually reverse themselves

Michaelas et al. (1999)	UK (3,500)	Ordinary least squares regression on cross-sectional panel data	Trade-off theory Life cycle model Pecking order theory Agency theory	Firm size, age, profitability, growth, and future growth opportunities, operating risk, asset structure, stock turnover, and net debtors have an effect on the level of short-term and long-term debt. Tax effects do not influence the total debt position of small firms. Capital structure is time and industry dependent. Short-term debt increases during recession
Ang et al. (2000)	US (1,708)	Ratio analysis Analysis of means using t and chi-squared tests	Agency theory	Agency costs are; (1) higher when an outsider rather than an insider manages the firm; (2) inversely related to the manager's ownership share; (3) increase with the number of non-manager shareholders, and; (4) are lower with greater monitoring by the banks
Lopez-Gracia and Aybar-Arias (2000)	Spain (Valencia) (461)	Multivariate Manova model	Pecking order theory	Larger companies show higher reliance on self-finance. Business sector affects the type of finance adopted
Hall et al. (2000)	UK (3,500)	Ordinary least squares regression on cross-sectional panel data F test	Trade-off theory Pecking order theory	Long-term debt is positively related to asset structure and size; and negatively related to age. Short-term debt is negatively related to profitability, asset structure, size, and age; and positively related to growth. Intra industry variation is evident
Scherr and Hulburt (2001)	US (1987 and 1993 NSSBF data)[a]	Ordinary least squares regression on cross-sectional panel data	Debt maturity	Default risk, maturity of assets, and capital structure are important determinants of debt maturity. Limited evidence for the influence of growth options, level of asymmetric information, tax status, and sector
Fu et al. (2002)	Taiwan (1,276)	Ordinary least squares regression on cross-sectional panel data		Profitability is positively related to capital growth, and equity financing; and negative related to debt financing

(*continued*)

Table B.9 (continued)

Author	Country (Sample size)	Method	Theoretical perspective	Principal findings
Forsaith and McMahon (2002)	Australia (871)	Univariate analysis on secondary (longitudinal survey) data	Pecking order theory Life cycle approach	Most SMEs are closely held. Only a small proportion undertake new equity financing. Smaller firms have a more limited equity base. When new equity financing is undertaken, the amount is significant relative to the existing equity base. Greater growth is evident among SMEs that are more willing to employ new equity financing
Zoppa and McMahon (2002)	Australia (871)	Logit analysis on secondary (longitudinal survey) data	Pecking order theory	Support for a modified pecking order theory that reflects the special circumstances and nuances of SME financing
Watson and Wilson (2002)	UK (626)	Regression analysis on primary survey data	Trade-off theory Pecking order theory Agency theory	Support for the pecking order theory. It is particularly strong in relation to closely held firms. There may be a pecking order within debt types
Esperanca et al. (2003)	Portugal (995)	Ordinary least squares regression Industry effects examined using Bonferroni and Tamahane tests	Modigliani and Miller propositions Trade-off theory Agency theory	Bankruptcy costs are significant. The ability to provide collateral is the determining factor for undertaking debt. Creditors weigh collateral value more than earnings. Younger firms are most dependent on debt. There is a positive relationship between debt and growth. Industry and size effects are important
Cassar and Holmes (2003)	Australia (1,555)	Ordinary least squares regression on cross-sectional panel data	Trade-off theory Pecking order theory	Asset structure, profitability, and growth are important determinants of capital structure. Support for trade-off and pecking order models
Reid (2003)	Scotland (150)	Dynamic financial model using the Pontryagin Maximum Principle	Agency theory. Signalling theory	If debt is relatively cheap, it will be used comprehensively, and the trajectories of debt, capital, and output over time will rise until a stationarity level is reached. Only then will a dividend be paid. If equity is relatively cheap, debt will still be acquired in the early stage after financial inception, and output and capital will also grow rapidly

Voulgaris et al. (2004)	Greece (143 SME 75 LSE)	Non-linear least squares using Marquardt's algorithm	Pecking order theory	For SMEs and LSEs, debt increases with size; debt is negatively related to profitability as predicted by the pecking order theory. Growth results in higher use of short-term debt. Higher profits are found to induce higher use of short-term debt for SMEs
Hall et al. (2004)	Belgium, Germany, Spain, Ireland, Italy, Netherlands, Portugal, and UK (4,000)	Ordinary least squares regression on cross-sectional panel data F test	Trade-off theory Pecking order theory	In some countries SMEs rely a great deal on internal funds; for all countries long-term debt is positively related to asset structure. In Belgium, Spain, UK, and Italy, availability of collateral is very important in raising long-term debt. Firms rely on their own resources, and are only able to borrow if they have collateral
Ullah and Taylor (2005)	UK (133)	Descriptive analysis of primary (survey) data	"Technology-based small firm finance" and location	Science-park firms are more likely to have been refused finance than off-park firms. Financial constraints vary with stage of development, and diminish as firms survive and mature. Some firms eschew external finance in order to retain control. Off-park firms believe their location has a positive impact on access to finance
Johnsen and McMahon (2005)	Australia (9,731)	Ordinary least squares regression on cross-sectional panel data	Trade-off theory Life cycle model Pecking order theory Agency theory	Sector is an important influence on financing behaviour in its own right (not just as a proxy variable for size, age, profitability, growth, asset structure and risk)
Sogorb Mira (2005)	Spain (6,482)	Regression analysis on cross-sectional panel data	Trade-off theory Pecking order theory Agency theory	Non-debt tax shields and profitability are negatively related with debt. Size, asset structure, and growth options are positively related with debt. Maturity matching is evident. The pecking order theory is supported

(*continued*)

Table B.9 (continued)

Author	Country (Sample size)	Method	Theoretical perspective	Principal findings
Gregory et al. (2005)	US (1993 NSSBF data)[a]	Multinomial logistic regression	Agency theory. Financial growth life cycle model Pecking order theory	Partial support for the financial growth life cycle model
Ou and Haynes (2006)	US (1993 and 1998 NSSBF data)[a]	Multivariate logistic regression	Agency theory Pecking order theory	Importance of external equity for SMEs in general is possibly overstated. Internal equity is the most important source of financing for SMEs. The pecking order theory is supported
Ebben and Johnson (2006)	US (146)	Principal components analysis	Resource dependence Organisational learning	Small business owners rely less on personal financing and joint-utilisation of resources as other sources of financing become available. Firms generally increase use of customer-related techniques over time
Ortqvist et al. (2006)	Sweden (592)	Structural equation modelling	Trade-off theory Pecking order theory	Asset structure is a determinant of debt financing. Firm size, age, growth, and profitability are not significant determinants of debt ratios for new ventures
Hussain and Matlay (2007)	UK (36)	Descriptive analysis of primary (interview) data	SME finance literature	Family and close network associates are important for financing, especially for ethnic minorities. Personal sources of finance decline in importance after start-up, and are replaced by bank finance in white owned firms
Ullah and Taylor (2007)	UK (133)	Descriptive analysis of primary (survey) data	"Technology-based small firm finance"	80% of respondents are finance constrained, split evenly between supply-side and demand-side financial constraints. A majority report funding difficulties at start-up, which recede as firms expand. Firm owners' personal finance is the primary source at start-up. A small majority employ venture capital

Colombo and Grilli (2007)	Italy (386)	Ordinary least squares and Tobit regression	"Technology-based small firm finance"	Italian NTBFs resort to external finance, especially bank loans, only when personal resources are exhausted. Results suggest NTBFs suffer from credit rationing, both in access to, and amount of, bank loans secured
Heyman et al. (2008)	Belgium (1,132)	Ordinary least squares and two stage least squares regression	Trade-off theory. Agency theory. Pecking order theory	High growth firms and firms with less tangible assets have lower debt ratios. More profitable firms have less debt. Evidence for maturity matching
Ortiz-Molina and Penas (2008)	US (995)	Ordinary least squares regression on cross-sectional panel data	Information asymmetry	Loan maturity is shorter for more informationally opaque firms, and for older, less experienced firm owners. Loan maturity increases with collateral pledges. Personal collateral is associated with longer maturities than business collateral
Blumberg and Letterie (2008)	Netherlands (1,140)	Bivariate models	Signalling theory	Personal wealth, particularly home ownership, is important in accessing external finance. Owners using their own capital are more likely to receive credit. Banks value commitment more than signals
López-Gracia and Sogorb-Mira (2008)	Spain (3,569)	Generalised moments method and two stage least squares regression	Trade-off theory Pecking order theory	Evidence for pecking order and trade-off theories. The importance of non-debt tax shields, growth opportunities, and internal resources are highlighted
Bartholdy and Mateus (2008)	Portugal (1,416)	Instrumental variables employed in estimating a Seemingly Unrelated Regression (SUR)	Trade-off theory Pecking order theory	The asset side of the balance sheet determines the liability side. This relationship is determined by asymmetric information and collateral. Trade-off and pecking order theories are rejected

(*continued*)

Table B.9 (continued)

Author	Country (Sample size)	Method	Theoretical perspective	Principal findings
Mac an Bhaird and Lucey (2010)	Ireland (299)	Ordinary least squares regression Industry effects examined using Seemingly Unrelated Regression (SUR)	Agency theory. Pecking order theory	The influence of age, size, ownership structure and provision of collateral is similar across industry sectors, indicating the universal effect of information asymmetries. Firms overcome the lack of adequate collateralisable firm assets in two ways: by providing personal assets as collateral for business debt, and by employing additional external equity to finance research and development projects
Studies adopting the "owner motivation/goals" approach – theoretical studies				
McMahon and Stanger (1995)		Theoretical paper	Financial objective function/utility theory	Propose that the SME financial objective function should reflect kinds of enterprise-specific risk arising from liquidity, diversification, transferability, flexibility, control, and accountability considerations. Conceptualisation by conventional utility theory is presented
Cressy (1995)		Theoretical paper	Disutility associated with control	A model of borrowing is provided where loan capital is productive and increases the firm's revenue, but brings the business under the control of the bank. Dynamic analysis identify "Movers" and "Stayers." For the "Movers," borrowing increases over time to a profit-maximising optimum; whereas for the "Stayers" independence of control is maintained but at the expense of non-growth

Studies adopting the "owner motivation/goals" approach – empirical studies

Cooley and Edwards (1983)	US (131)	Descriptive analysis of primary (survey) data	Financial objectives of firm owners	Owners of small closely-held firms consider maximisation of net income as the most important financial objective
Norton (1991)	US (110)	Descriptive analysis of primary (survey) data	Agency theory. Signalling	Management perceptions of the tradeoffs involved in external financing will determine whether debt, equity, or neither will be issued. The sum total of these perceptions, beliefs, and conditions over time form the firm's present capital structure
Chaganti et al. (1995)	US (903)	Discriminant analysis of secondary (survey) data	Signalling theory. Strategic management	Satisfaction with "economic need" drives the entrepreneur toward debt financing. Consistent with signalling theory, entrepreneurs who are bullish about their ventures seek equity financing rather than debt financing. "Sweat equity" and financial capital are substitutes. Entrepreneurs' personal characteristics play a key role in capital structure decision
Ang et al. (1995)	US (692)	Bivariate analysis of secondary (survey) data	Agency theory	In the absence of available business collateral, a substantial proportion of SME owners are required to pledge personal commitments to obtain business loans. Firm owners who lack personal assets and wealth to provide personal commitments are more likely to experience credit rationing
Le Cornu et al. (1996)	Australia (30)	Analysis of interviews, including Mann Whitney tests	Financial objective function	Owner-managers' objectives include: attention to liquidity considerations, retaining control, and maintaining independence
Kuratko et al. (1997)	US Midwest (234)	Frequency analysis, confirmatory factor analysis	Managerial attitudes and performance	Investigates a set of goals which motivate entrepreneurs to sustain their business development efforts. A four factor structure of goal statements is developed; extrinsic rewards, independence/ autonomy, intrinsic rewards, and family security

(*continued*)

Table B.9 (continued)

Author	Country (Sample size)	Method	Theoretical perspective	Principal findings
Wright et al. (1997)	UK (13)	Case analysis	Motivations of entrepreneurs	There are two types of serial entrepreneurs; venture repeaters (defensive reasons); and serial dealmakers and organic serials (opportunistic). Capital gain is less important the second time around, and less exposure to risk is important. Personal commitment is high.
Hamilton and Fox (1998)	New Zealand (185)	Bivariate analysis on primary (questionnaire) data	Pecking order theory	Independence of the firm owner is the overriding consideration in choosing source of financing, independent of size or age of the firm. No evidence for a funding gap
Kotey (1999)	New South Wales (224)	Cluster analysis and Manova	Strategic objectives/ personal values of firm owners	Owner-managers of higher leveraged firms were found to be less entrepreneurial than those of low/medium leveraged firms
Giudici and Paleari (2000)	Italy (46)	Probit analysis on primary (questionnaire) data	Pecking order theory.	Respondents rely on personal finance, and secondly on short term bank debt. They wish to maintain control over firm activities and are willing to issue outside equity only if new investors also provide non financial competencies
Howorth (2001)	UK (13)	Case analysis	Pecking order theory.	For the majority of cases, the pecking order theory applies only in truncated form. Both demand and supply factors important, but demand side takes preference. Where truncation occurs at long-term debt firms are constrained, but not at external equity
Poutziouris (2003)	UK (922)	Principal components analysis; Cluster analysis; Chi-squared analysis on questionnaire data	Strategic objectives	Four clusters of firm owner objectives are identified; growth; survival-oriented; exit oriented, and control oriented

Hogan and Hutson (2005)	Ireland (117)	Descriptive analysis of primary (survey) data	Pecking order theory	Internal funds are the most important source of funding for NTBFs. Respondents prefer outside equity to debt
Fitzsimmons and Douglas, (2006)	Australia (4,500)	Logistic regression	Pecking order theory	Only 5% of SMEs intend to sell equity. The primary reasons include the firm owner's intention to sell the firm, and to fund growth. Intention to sell equity is negatively related to family ownership
Studies adopting a combination of "owner motivation" and "firm" characteristic approaches				
Cressy and Olofsson, (1997b)	Sweden (285)	Univariate analysis of primary (survey) data	Pecking order theory	Support for the pecking order theory. Control is the important determinant. Owners of younger firms in business services are willing to sacrifice control for finance and added expertise
Jordan et al. (1998)	South East England (275)	Ordinary least squares and weighted least squares regression	Strategy	Competitive strategy is significant in determining capital structure, highlighting issues of risk, uncertainty, and information asymmetries. Support for pecking order theory. Positive relationships between turnover and risk, and debt levels may evidence "distress" borrowing
Avery et al. (1998)	US (1987 and 1993 NSSBF data)[a] SCF (1989 1992 and 1995)	Logistic regression on cross-sectional panel data	Personal commitment use	Personal commitments are important for firms seeking loans. Guarantees are more prevalent than collateral. Personal commitments are substitutes for business collateral. Personal collateral and personal guarantees are not substitutes

(*continued*)

Table B.9 (continued)

Author	Country (Sample size)	Method	Theoretical perspective	Principal findings
Romano et al. (2001)	Australia (1,490)	Principal components analysis Confirmatory factor analysis Structural equation modelling	Modigliani and Miller propositions Agency theory Trade-off theory Pecking order theory	Size, family control, business planning, and objectives are positively associated with debt. External equity is considered by owners of large firms, young firms, and owners who plan to achieve growth through increasing profit margins. It is less likely to be considered by older family firms. The interplay between multiple social, family, and financial factors is complex
Coleman and Cohn (2000)	US (4,637)	Multiple regression analysis	Modigliani and Miller propositions Pecking order theory	Leverage is predominantly a function of firm characteristics (rather than owner characteristics). SME leverage is a function of size, age, profitability, organisation structure, and willingness or ability to supply collateral
Berggren et al. (2000)	Sweden (281)	Structural equation modelling	Control aversion	Support for control aversion and pecking order theory
Basu and Parker (2001)	UK (195)	Heckman's two stage sample selection model	Family finance	After bank finance, borrowing from family and friends is the chief source of funds for new business start-ups in many countries, including the UK
Cassar (2004)	Business longitudinal survey (292)	Tobit, logit, and ordinary least square regressions on cross-sectional panel data	Trade-off theory Pecking order theory	The larger the start-up, the greater the percentage of debt employed. Where a firm has no tangible assets, informal networks are important. Start-ups with the intent to grow are more likely to use bank financing. Personal characteristics of the firm owner are unimportant

[a]Denotes source of data

Appendix C
Sectoral Classification of Sample Frame by NACE Codes

Two digit NACE code	Sectoral classification	Number of firms	Proportion of total sample(%)
	Metal manufacturing and engineering		
21/22	Metal ore and metal production	3	0.40
31	Metal articles	17	2.40
32	Mechanical engineering	24	3.40
33	Office and data processing machinery	40	5.70
34	Electrical engineering	15	2.10
35	Manufacture of motor parts and vehicles	4	0.60
36	Other means of transport manufacture	1	0.10
37	Instrument engineering	10	1.40
38	Computer hardware and related products	6	0.90
		120	17.09
	Other manufacturing		
26	Man-made fibres industry	3	0.40
25	Chemical industry	12	1.70
39	Medical devices	6	0.90
41	Food processing	45	6.40
42	Drink and tobacco industry	4	0.60
43	Textiles	4	0.60
44	Leather	1	0.10
45	Clothing and footwear	17	2.40
46	Timber and wooden furniture	20	2.80
47	Paper, printing, and publishing	45	6.40
48	Rubber and plastics processing	15	2.10
49	Other manufacturing	58	8.30
		230	32.76
40	Computer software development and services	88	12.50
	Distribution, retail, hotels, and catering		
61	Wholesale distribution	35	5.00
63	Marketing	18	2.60

(*continued*)

(continued)

Two digit NACE code	Sectoral classification	Number of firms	Proportion of total sample(%)
64	Retail distribution	34	4.80
66	Hotels and catering	46	6.60
		133	18.9
	Other services		
76	Supporting services to transport	3	0.40
77	Travel/Freight agents and warehouses	12	1.70
78	Communications	10	1.40
94	Research and development	3	0.40
95	Medical and veterinary services	3	0.40
96	Other general services	24	3.40
97	Recreational and cultural services	2	0.30
105/106	Building industry professionals	8	1.10
72	Other land transport	2	0.30
75	Air transport	1	0.10
		68	9.69
	Other		
01	Agriculture	17	2.40
03	Fishing	4	0.60
51	Building and civil engineering	42	6.00
		63	9.0
	Total	702	

Appendix D
Supplementary Tables Referenced in Chapter 4

Supporting tables presenting results of cross-tabulations, chi-square tests, and directional measures.

Table D.1 Crosstabulation of sector with "I issue external equity only as a last resort" (% of respondents)

Sector	I issue external equity only as a last resort (n = 279)					
	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Total
Metal manufacturing and engineering	5	5.7	2.9	1.4	0	15
Other manufacturing	5.7	7.9	5.0	1.4	0.4	20.4
Computer software development and services	2.2	5.0	6.1	4.7	0	17.9
Distribution, retail, hotels, and catering	8.2	8.6	8.2	2.9	0.4	28.3
Other services	2.9	2.5	1.4	2.2	0.4	9.3
Other	3.2	3.2	2.5	0	0	9.0
Total	27.2	33	26.2	12.5	1.1	100

Table D.2 Chi-square and directional measures for crosstabulation of sector with "I issue external equity only as a last resort"

		Value	Approximate significance
Pearson chi-square		29.14	0.085*
Goodman and Kruskal tau	Industry dependent	0.020	0.125
	"Issue equity" dependent	0.024	0.137
Uncertainty coefficient	Industry dependent	0.034	0.042**
	"Issue equity" dependent	0.042	0.042**

**, * Statistically significant at the 95% and 90% levels of confidence respectively

Table D.3 Crosstabulation of sector with "A long term bank loan would suit my investment needs" (% of respondents)

Sector	"A long term bank loan would suit my investment needs" (n = 283)					
	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Total
Metal manufacturing and engineering	1.4	5.7	4.2	3.2	0.7	15.2
Other manufacturing	3.2	8.1	6	2.5	0.7	20.5
Computer software development and services	0.7	4.9	4.6	6	1.8	18
Distribution, retail, hotels, and catering	5.7	9.5	6.4	4.6	1.4	27.6
Other services	1.4	1.4	3.2	3.2	0.4	9.5
Other	1.4	4.6	1.1	1.1	1.1	9.2
Total	13.8	34.3	25.4	20.5	6	100

Table D.4 Chi-square and directional measures for crosstabulation of sector with "A long term bank loan would suit my investment needs"

		Value	Approximate significance
Pearson chi-square		29.9	0.071*
Goodman and Kruskal tau	Sector dependent	0.021	0.088*
	"A long term bank loan would suit my investment needs" dependent	0.029	0.038**
Uncertainty coefficient	Sector dependent	0.032	0.05**
	"A long term bank loan would suit my investment needs" dependent	0.037	0.05**

**Statistically significant at the 95% and 90% levels of confidence respectively

Table D.5 Chi-square and directional measures for crosstabulation of financial requirement with perception of difficulty in raising additional finance

Funding requirement	Pearson chi-square	Goodman and Kruskal tau	Uncertainty coefficient (symmetric)
Debt now	2.37 (0.124)	0.012 (0.125)	0.010 (0.125)
Debt in the next 3 years	0.017 (0.896)	0.000 (0.896)	0.000 (0.896)
Equity now	36.43 (0.000***)	0.193 (0.000***)	0.161 (0.000***)
Equity in the next 3 years	35.33 (0.000***)	0.190 (0.000***)	0.174 (0.000***)

***Statistically significant at the 99% level of confidence

Table D.6 Crosstabulation of sector with perception of difficulty in raising additional external finance

Sector	Perceived difficulty in raising additional external finance (% of respondents) (n = 227)
Metal manufacturing and engineering	4
Other Manufacturing	2.6
Computer software development and services	7
Distribution, retail, hotels, and catering	2.6
Other services	1.3
Other	2.6
Total (n = 46)	20.1

Table D.7 Chi-square and directional measures for crosstabulation of sector with perception of difficulty in raising additional external finance

		Value	Approximate significance
Pearson chi-square		14.82	0.011***
Goodman and Kruskal tau	Sector dependent	0.016	0.002***
	"Perception of difficulty in raising additional finance" dependent	0.065	0.011***
Uncertainty coefficient	Sector dependent	0.019	0.012***
	"Perception of difficulty in raising additional finance" dependent	0.064	0.012***

***Statistically significant at the 99% level of confidence

Table D.8 Crosstabulation of ownership structure with desire to retain control of the firm

	Private limited firm – shares traded within the family (%)	Private limited firm – shares more widely traded (%)
Strongly agree or agree with the statement "Retain a majority shareholding (>50%) in the business for the founder(s)" (n = 284)	88	50

Table D.9 Crosstabulation of sector with desire to retain control of the firm

Sector	"Retain a majority shareholding (>50%) in the business for the founder(s)" (n = 284)					
	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Total
Metal manufacturing and engineering	7.8	5	1.4	0.7	0.4	15.2
Other manufacturing	7.4	9.2	2.8	1.1	0	20.6
Computer software development and services	4.3	2.8	7.8	2.1	0.7	17.7
Distribution, retail, hotels, and catering	14.5	8.2	4.3	1.4	0	28.4
Other services	4.6	2.5	1.4	0.4	0	8.9
Other	4.3	2.5	1.8	0.4	0.4	9.2
Total	42.9	30.1	19.5	6	1.4	100

Table D.10 Chi-square and directional measures for crosstabulation of sector with desire to retain control of the firm

		Value	Approximate significance
Pearson chi-square		44.34	0.001***
Goodman and Kruskal tau	Sector dependent	0.036	0.000***
	"Desire to retain control of the firm" dependent	0.050	0.000***
Uncertainty coefficient	Sector dependent	0.044	0.002***
	"Desire to retain control of the firm" dependent	0.059	0.002***

***Statistically significant at the 99% level of confidence

Table D.11 Crosstabulation of firm age with "Banks understand my business" (% of respondents)

Firm age (years)	"Banks understand my business" (n = 289)					
	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Total
<5	0	2.1	1	1.4	0.3	4.8
5–9	1.4	4.8	5.5	4.2	1.7	17.6
10–14	0.7	3.8	5.5	2.1	0.7	12.8
15–19	0.3	4.5	4.2	1.7	0	10.7
20–29	1.7	9	6.2	4.8	0.3	22.1
>30	3.1	15.6	8.3	4.5	0.3	31.8
Total						100

Table D.12 Chi-square and directional measures for crosstabulation of firm age by "Banks understand my business"

		Value	Approximate significance
Pearson chi-square		24.43	0.224
Goodman and Kruskal tau	Firm age dependent	0.020	0.098*
	"Banks understand my business" dependent	0.021	0.256
Uncertainty coefficient	Firm age dependent	0.026	0.195
	"Banks understand my business" dependent	0.032	0.195

*Statistically significant at the 90% level of confidence

Table D.13 Crosstabulation of sector with "Banks understand my business" (% of respondents)

Sector	"Banks understand my business"					
	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Total
Metal manufacturing and engineering	0.7	7.7	4.5	2.1	0.3	15.3
Other manufacturing	1.7	8.4	5.9	4.5	0.3	20.9
Computer software development and services	0	5.2	6.3	4.9	1.4	17.8
Distribution, retail, hotels, and catering	3.5	13.6	8.4	2.4	0.3	28.2
Other services	0.7	3.5	2.8	2.1	0	9.1
Other	0.7	1.4	2.8	2.8	1	8.7
Total	7.3	39.7	30.7	18.8	3.5	100

Table D.14 Chi-square and directional measures for crosstabulation of sector with "Banks understand my business"

		Value	Approximate significance
Pearson Chi-square		35.9	0.016**
Goodman and Kruskal tau	Sector dependent	0.027	0.007***
	"Banks understand my business" dependent	0.029	0.030**
Uncertainty coefficient	Sector dependent	0.040	0.006***
	"Banks understand my business" dependent	0.051	0.006***

***, ** Statistically significant at the 99% and 95% levels of confidence respectively

Table D.15 Crosstabulation of sector with the financial objective "Maximise potential selling value of the firm" (% of respondents)

Sector	"Maximise potential selling value of the firm"		
	Primary objective	Secondary objective	Tertiary objective
Metal manufacturing and engineering	1.1	5.1	1.8
Other manufacturing	2.2	2.9	3.6
Computer software development and services	7.9	2.9	1.1
Distribution, retail, hotels, and catering	4	3.6	4
Other services	2.5	1.4	2.5
Other	2.5	1.1	0.4
Total (n = 277)	20.2	17	13.4

Table D.16 Chi-square and directional measures for crosstabulation of sector with the financial objective "Maximise potential selling value of the firm"

		Value	Approximate significance
Pearson chi-square		51.5	0.000***
Goodman and Kruskal tau	Sector dependent	0.037	0.000***
	"Maximise potential selling value of the firm" dependent	0.047	0.000***
Uncertainty coefficient	Sector dependent	0.053	0.000***
	"Maximise potential selling value of the firm" dependent	0.058	0.000***

*** Statistically significant at the 99% level of confidence

Table D.17 Crosstabulation of sector with the financial objective "Maximise net income/profit" (% of respondents)

Sector	"Maximise potential selling value of the firm"		
	Primary objective	Secondary objective	Tertiary objective
Metal manufacturing and engineering	11.8	1.8	2.1
Other manufacturing	15.4	2.1	1.8
Computer software development and services	6.4	5.4	2.9
Distribution, retail, hotels, and catering	13.9	9.6	3.9
Other services	5.4	2.9	0.4
Other	5	2.1	1.1
Total (n = 277)	57.9	23.9	12.2

Table D.18 Chi-square and directional measures for crosstabulation of sector with the financial objective "Maximise net income/profit"

		Value	Approximate significance
Pearson chi-square		45.47	0.001***
Goodman and Kruskal tau	Sector dependent	0.039	0.000***
	"Maximise net income/profit" dependent	0.062	0.000***
Uncertainty coefficient	Sector dependent	0.048	0.001***
	"Maximise net income/profit" dependent	0.074	0.001***

*** Statistically significant at the 99% level of confidence

References

Acs, Z. and Audretsch, D. B. (2003), Innovation and technological change. In: Acs, Z. and Audretsch, D. B. (eds.) *Handbook of entrepreneurship research: An interdisciplinary survey and introduction*. New York: Springer.

Acs, Z., Carlsson, B. and Karlsson, C. (1999), The linkages among entrepreneurship, SMEs and the macroeconomy. In: Acs, Z., Carlsson, B. and Karlsson, C. (eds.) *Entrepreneurship, small and medium-sized enterprises and the macroeconomy*. Cambridge: Cambridge University Press.

Aghion, P., Dewatripont, M. and Rey, P. (1999), Competition, financial discipline and growth. *Review of Economic Studies,* 66 (229): 825–852.

Almeida, H. and Campello, M. (2007), Financial constraints, asset tangibility, and corporate investment. *Review of Financial Studies,* 20 (5): 1429–1460.

Alti, A. (2006), How persistent is the impact of market timing on capital structure? *The Journal of Finance,* 61 (4): 1681–1710.

Andrade, G. and Kaplan, S. N. (1998), How costly is financial (not economic) distress? Evidence from highly leveraged transactions. *Journal of Finance,* 53 (5): 1443–1493.

Ang, J. S. (1991), Small business uniqueness and the theory of financial management. *The Journal of Small Business Finance,* 1 (1): 1–13.

Ang, J. S. (1992), On the theory of finance for privately held firms. *The Journal of Small Business Finance,* 1 (3): 185–203.

Ang, J. S., Wuh Lin, J. and Tyler, F. (1995), Evidence on the lack of separation between business and personal risks among small businesses. *The Journal of Small Business Finance,* 4 (2–3): 197–210.

Ang, J. S., Cole, R. A. and Wuh Lin, J. (2000), Agency costs and ownership structure. *The Journal of Finance,* LV (1): 81–106.

Armstrong, J. S. and Lusk, E. J. (1987), Return postage in mail surveys. *Public Opinion Quarterly,* 51 (2): 233–249.

Arrow, K. J. (1962), Economic welfare and the allocation of resources for invention. In: Nelson, R. R. (ed.) *The rate and direction of inventive activity: Economic and social factors*. Princeton, NJ: Princeton University Press.

Atkinson, J. and Storey, D. (1994), Small firms and employment. In: Storey, D. (ed.) *Employment, the small firm and the labour market*. London: Routledge.

Audretsch, D. B. (1991), New-firm survival and the technological regime. *Review of Economics and Statistics,* 73 (3): 441.

Audretsch, D. B. and Elston, J. A. (1997), Financing the German *Mittelstand*. *Small Business Economics,* 9 (2): 97–110.

Avery, R. B., Bostic, R. W. and Samolyk, K. A. (1998), The role of personal wealth in small business finance. *Journal of Banking and Finance,* 22 (6–8): 1019–1061.

Ayadi, R. (2008), SME financing in Europe: Measures to improve the rating culture under the new banking rules. Paper presented at the conference "Financing of SMEs in Europe", Société Universitaire Européenne de Recherches Financiéres, Palais du Luxembourg, Paris, 11–12 September.

Baas, T. and Schrooten, M. (2006), Relationship banking and SMEs: A theoretical analysis. *Small Business Economics,* 27 (2–3): 127–137.

Baeyens, K. and Manigart, S. (2005), Follow on financing of venture capital backed companies: The choice between debt, equity, existing and new investors. Working paper 06/362, Faculty of Economics and Business Administration, Ghent University, Belgium.

Baker, H. K. and Mukherjee, T. K. (2007), Survey research in finance: Views from journal editors. *International Journal of Managerial Finance,* 3 (1): 11–25.

Baker, M. and Wurgler, J. (2002), Market timing and capital structure. *The Journal of Finance,* LVII (1): 1–32.

Balakrishnan, S. and Fox, I. (1993), Asset specificity, firm heterogeneity and capital structure. *Strategic Management Journal,* 14 (1): 3–16.

Baltagi, B. H. (2005), *Econometric analysis of panel data*, 3rd edition. Chichester: Wiley.

Bancel, F. and Mittoo, U. R. (2004), Cross-country determinants of capital structure choice: A survey of European firms. *Financial Management,* 33 (4): 103–132.

Barclay, M. J. and Smith, C. W. (2005), The capital structure puzzle: The evidence revisited. *Journal of Applied Corporate Finance,* 17 (1): 8–17.

Barkham, R., Gudgin, G., Hart, M. and Hanvey, E. (1996), *The determinants of small business growth: An inter-regional study in the United Kingdom 1986–90*. London: Jessica Kingsley and the Regional Studies Association.

Barnea, A., Haugen, R. A. and Senbet, L. W. (1981), An equilibrium analysis of debt financing under costly tax arbitrage and agency problems. *Journal of Finance,* 36 (3): 569–581.

Barry, F. and Kearney, C. (2006), MNEs and industrial structure in host countries: A portfolio analysis of Irish manufacturing. *Journal of International Business Studies,* 37 (3): 392–406.

Bartholdy, J. and Mateus, C. (2008), *Financing of SMEs: An asset side story*. Paper presented at the conference "Financing of SMEs in Europe", Société Universitaire Européenne de Recherches Financiéres, Palais du Luxembourg, Paris, 11–12 September.

Barton, S. L. and Gordon, P. J. (1988), Corporate strategy and capital structure. *Strategic Management Journal,* 9 (6): 623–632.

Barton, S. L. and Matthews, C. H. (1989), Small firm financing: Implications from a strategic management perspective. *Journal of Small Business Management,* 27 (1): 1–7.

Basu, A. and Parker, S. C. (2001), Family finance and new business start-ups. *Oxford Bulletin of Economics and Statistics,* 63 (3): 333–358.

Bates, J. and Bell, M. (1973), Small manufacturing business in Northern Ireland. *Journal of the Statistical and Social Inquiry Society of Ireland,* 22 (5): 162–187.

Bates, J. and Hally, D. L. (1982), *The financing of small business*. London: Sweet and Maxwell.

Beck, T. and Demirguc-Kunt, A. (2006), Small and medium-size enterprises: Access to finance as a growth constraint. *Journal of Banking and Finance,* 30 (11): 2931–2943.

Beck, T., Demirguc-Kunt, A. and Maksimovic, V. (2004), *Financing patterns around the world: Are small firms different*? Policy research working paper 2905, The World Bank, Washington D.C.

Benton, T. and Craib, I. (2001), *Philosophy in social science*. New York: Palgrave.

Berger, A. N. and Udell, G. F. (1990), Collateral, loan quality, and bank risk. *Journal of Monetary Economics,* 25 (1): 21–42.

Berger, A. N. and Udell, G. F. (1995), Relationship lending and lines of credit in small firm finance. *The Journal of Business,* 68 (3): 351–381.

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 (6–8): 613–673.

Berger, A. N. and Udell, G. F. (2002), Small business credit availability and relationship lending: The importance of bank organisational structure. *Economic Journal,* 112 (477): F32–F53.

Berger, A. N. and Udell, G. F. (2003), Small business and debt finance. In: Acs, Z. and Audretsch, D. B. (eds.) *Handbook of entrepreneurship research: An interdisciplinary survey and introduction*. New York: Springer.

Berger, A. N. and Udell, G. F. (2006), A more complete conceptual framework for SME finance. *Journal of Banking and Finance,* 30 (11): 2945–2966.

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.

Berry, A., Grant, P. and Jarvis, R. (2004), European bank lending to the UK SME sector. *International Small Business Journal,* 22 (2): 115–130.

Besanko, D. and Thakor, A. V. (1987), Collateral and rationing: Sorting equilibria in monopolistic and competitive credit markets. *International Economic Review,* 28 (3): 671–689.

Bester, H. (1985), Screening vs. rationing in credit markets with imperfect information. *American Economic Review,* 75 (4): 850–855.

Bhattacharya, S. and Ritter, J. R. (1983), Innovation and communication: signalling with partial disclosure. *Review of Economic Studies,* 50 (161): 331–346.

Binks, M. R. and Ennew, C. T. (1998), *Private businesses and their banks: Forum of private business bank survey 1998*. University of Nottingham Business School.

Binks, M., Jennings, A. and Vale, P. (1986), Tripartite funding and the constriction of enterprise. In: Faulkner, T., Beaver, G., Lewis, J. and Gibb, A. (eds.) *Readings in small business*. Aldershot: Gower.

Binks, M. R., Ennew, C. and Reed, G. (1988), *Small business and banks: A two nation perspective*. Report to the Forum of Private Business, UK and the National Federation of Independent Businesses, USA.

Birch, D. (1979), *The job generation process*. Cambridge: MIT programme on neighbourhood and regional change.

Black, J., De Meza, D. and Jeffreys, D. (1996), House prices, the supply of collateral and the enterprise economy. *The Economic Journal,* 106 (434): 60–75.

Blackburn, R. and Stokes, D. (2000), Breaking down the barriers: Using focus groups to research small and medium-sized enterprises. *International Small Business Journal,* 19 (1): 44–67.

Blanco-Mazagatos, V., De Quevedo-Puente, E. and Castrillo, L. A. (2007), The trade-off between financial resources and agency costs in the family business: An exploratory study. *Family Business Review,* 20 (3): 199–213.

Blumberg, B. F. and Letterie, W. A. (2008), Business starters and credit rationing. *Small Business Economics*, 30 (2): 187–200.

Boden, R. J. and Nucci, A. R. (2000), On the survival prospects of men's and women's new business ventures. *Journal of Business Venturing,* 15 (4): 347–362.

Bolton Committee Report (1971), *Report of the committee of inquiry on small firms*. Cmnd. 4811, London: HMSO.

Boot, A. W. A., Thakor, A. V. and Udell, G. F. (1991), Secured lending and default risk: Equilibrium analysis, policy implications and empirical results. *Economic Journal,* 101 (406): 458–472.

Booth, A. (2003), A quest for questionnaires. *Health Information and Libraries Journal,* 20 (1): 53–56.

Bougheas, S. (2004), Internal versus external financing of R&D. *Small Business Economics,* 22 (1): 1–17.

Brannick, T. (1997), An overview of the research process. In: Brannick, T. and Roche, W. K. (eds.) *Business research methods: Strategies, techniques and sources*. Irish Studies in Management, Dublin: Oak Tree Press.

Brav, A., Graham, J. R., Harvey, C. R. and Michaely, R. (2005), Payout policy in the 21st century. *Journal of Financial Economics,* 77 (3): 483–527.

Brealey, R. A., Myers, S. C. and Allen, F. (2006), *Principles of corporate finance*, 9th edition. Boston: McGraw-Hill Irwin.

Brierley, P. (2001), *The financing of technology-based small firms: A review of the literature*. Bank of England Quarterly Bulletin, Spring 2001.

Brierley, P. G. and Kearns, A. (2001), *The financing patterns of new and old economy firms in the UK*. Bank of England Discussion Paper. London: Bank of England.

British Venture Capital Association (BVCA) (2003), BVCA response to European commission green paper on entrepreneurship. Viewed 9 November 2007, http://www.bvca.co.uk/publications/ec_entrepreneur.html.

Bronfenbrenner, U. (1979), *The ecology of human development: Experiments by nature and design*. Cambridge: Harvard University Press.

Brown, C., Hamilton, J. and Medoff, J. (1990), *Employers large and small*. Cambridge: Harvard University Press.

Bruns, V. and Fletcher, M. (2008), Banks' risk assessment of Swedish SMEs. *Venture Capital,* 10 (2): 171–194.

Brush, C. G. (1992), Research on women business owners: Past trends, a new perspective and future directions. *Entrepreneurship: Theory and Practice,* 16 (4): 5–30.

Bryman, A. and Bell, E. (2003), *Business research methods*. Oxford: Oxford University Press.

Buckland, R. and Davis, E. W. (1990), The pricing of new issues on the unlisted securities market: The influence of firm size in the context of the information content of new issue prospectuses. *The British Accounting Review,* 22 (3): 207–222.

Burnham, J. B. (2003), Why Ireland boomed. *The Independent Review,* 7 (4): 537–556.

Burrell, G. and Morgan, G. (1979), *Sociological paradigms and organisational analysis*. London: Heinemann.

Bygrave, W. D. (1989), The entrepreneurship paradigm (I): A philosophical look at its research methodologies. *Entrepreneurship Theory and Practice,* 14 (1): 7–26.

Bygrave, W. D. (2007), The entrepreneurship paradigm revisited. In: Neergaard, H. and Ulhoi, J. P. (eds.) *Handbook of qualitative research methods in entrepreneurship*. Cheltenham: Edward Elgar Publishing.

Bygrave, W. D. and Quill, M. (2007), Global entrepreneurship monitor 2006: Financing report. Babson College and London Business School: GEM Consortium.

Camagni, R. P. (1995), The concept of *innovative* milieu and its relevance for public policies in European lagging regions. *Papers in Regional Science,* 74 (4): 317–340.

Cambridge Small Business Research Centre (CSBRC) (1992), *The state of British enterprise*. Department of Applied Economics, University of Cambridge.

Carpenter, R. E. and Petersen, B. C. (2002a), Capital market imperfections, high-tech investment, and new equity financing. *The Economic Journal,* 112 (477): F54–F72.

Carpenter, R. E. and Petersen, B. C. (2002b), Is the growth of small firms constrained by internal finance? *The Review of Economics and Statistics,* 84 (2): 298–309.

Carter, S. and Rosa, P. (1998), The financing of male- and female-owned businesses. *Entrepreneurship and Regional Development,* 10 (3): 225–241.

Cassar, G. (2004), The financing of business start-ups. *Journal of Business Venturing,* 19 (2): 261–283.

Cassar, G. and Holmes, S. (2003), Capital structure and financing of SMEs: Australian evidence. *Accounting and Finance,* 43 (2): 123–147.

Central Statistics Office (CSO) (2007), *Measuring Ireland's progress, 2006*. Dublin: The Stationery Office.

Central Statistics Office (CSO) (2007), *Annual services enquiry, 2005*. Dublin: The Stationery Office.

Central Statistics Office (CSO) (2007), *Census of industrial production, 2005*. Dublin: The Stationery Office.

Chaganti, R., Decarolis, D. and Deeds, D. (1995), Predictors of capital structure in small ventures. *Entrepreneurship Theory and Practice,* 20 (2): 7–18.

Chan, Y. S. and Kanatas, G. (1985), Asymmetric valuations and the role of collateral in loan agreements. *Journal of Money, Credit and Banking,* 17 (1): 84–95.

Chandler, G. N. and Hanks, S. H. (1998), An examination of the substitutability of founders human and financial capital in emerging business ventures. *Journal of Business Venturing,* 13 (5): 353–369.

Chichilnisky, G. (2005), *The global economy and the EU*. In: Proceedings of the Global Finance Conference, Trinity College Dublin. The Global Finance Association: 5–7.

Chittenden, F., Hall, G. and Hutchinson, P. (1996), Small firm growth, access to capital markets and financial structure: Review of issues and an empirical investigation. *Small Business Economics,* 8 (1): 56–67.

Chittenden, F., Poutziouris, P., Michaelas, N. and Watt, T. (1998), *The March 1998 budget and small business taxation*. London: National Westminster Bank.

Cicourel, A. V. (1982), Interviews, surveys, and the problem of ecological validity. *American Sociologist,* 17: 11–20.

Coco, G. (2000), On the use of collateral. *Journal of Economic Surveys,* 14 (2): 191–214.

Cole, R. A. (1998), The importance of relationships to the availability of credit. *Journal of Banking and Finance,* 22 (6–8): 959–977.

Cole, R. A. (2008), *What do we know about the capital structure of privately held firms? Evidence from the surveys of small business finances*. Washington, D.C.: Small Business Administration.

Coleman, S. and Cohn, R. (2000), Small firms' use of financial leverage: Evidence from the 1993 national survey of small business finances. *Journal of Business and Entrepreneurship,* 12 (3): 87–103.

Colombo, M. and Grilli, L. (2007), Funding gaps? Access to bank loans by high-tech start-ups. *Small Business Economics,* 29 (1): 25–46.

Cook, T. D. and Campbell, D. T. (1979), *Quasi-experimentation: Design and analysis issues for field settings.* London: Houghton Mifflin.

Cooley, P. L. and Edwards, C. E. (1983), Financial objectives of small firms. *American Journal of Small Business,* 8 (1): 27–31.

Cooper, A. C., Woo, C. Y. and Dunkelberg, W. C. (1988), Entrepreneurs' perceived chances for success. *Journal of Business Venturing,* 3 (2): 97–108.

Cosh, A. and Hughes, A. (1994), Size, financial structure and profitability: UK companies in the 1980s. In: Hughes, A. and Storey, D. J. (eds.) *Finance and the small firm.* London: Routledge.

Cosh, A., Hughes, A. and Wood, E. (1999), Innovation in UK SMEs: Causes and consequences for firm failure and acquisition. In: Acs, Z., Carlsson, B. and Karlsson, C. (eds.) *Entrepreneurship, small and medium-sized firms and the macroeconomy.* Cambridge: Cambridge University Press.

Cowling, M., Samuels, R. and Sugden, R. (1991), *Small firms and clearing banks: Report for the association of British chambers of commerce*. Research Centre for Industrial Strategy, University of Birmingham.

Cox, B. G., Elliehausen, G. E. and Wolken, J. D. (1989), *Surveying small businesses about their finances*. In: Proceedings of the international conference of the American Statistical Association: Section on survey research methods. Virginia: American Statistical Association: 553–557.

Cressy, R. (1995), Business borrowing and control: A theory of entrepreneurial types. *Small Business Economics,* 7 (3): 291–300.

Cressy, R. (2002), Funding gaps: A symposium. *The Economic Journal,* 112 (477): F1–F16.

Cressy, R. (2006a), Determinants of small firm survival and growth. In: Casson, M., Yeung, B., Basu, A. and Wadeson, N. (eds.) *The Oxford handbook of entrepreneurship.* Oxford: Oxford University Press.

Cressy, R. (2006b), Why do most firms die young? *Small Business Economics,* 26 (2): 103–116.

Cressy, R. (1993), *Loan commitments and business starts: An empirical investigation of UK data*. Centre for Small and Medium Sized Enterprises (CSME), Warwick Business School, University of Warwick.

Cressy, R. and Olofsson, C. (1997a), European SME financing: An overview. *Small Business Economics,* 9 (2): 87–96.

Cressy, R. and Olofsson, C. (1997b), The financial conditions for Swedish SMEs: Survey and research agenda. *Small Business Economics,* 9 (2): 179–194.

Cressy, R. and Toivanen, O. (2001), Is there adverse selection in the credit market? *Venture Capital,* 3 (3): 215–238.

Cruickshank, D. (2000), Competition in UK banking: A report to the Chancellor of the Exchequer. London: The Stationery Office.

Culliton, J. (1992), *A time for change: Industrial policy in the 1990s. A report of the Industrial Policy Review Group*. Dublin: The Stationery Office.

Curran, J. and Blackburn, R. A. (2001), *Researching the small enterprise*. London: Sage.

Curran, J., Jarvis, R., Blackburn, R. A. and Black, S. (1993), Networks and small firms: Constructs, methodological strategies and some findings. *International Small Business Journal,* 11 (2): 13–25.

D' Amboise, G. and Muldowney, M. (1988), Management theory for small business: Attempts and requirements. *Academy of Management Review,* 13 (2): 226–240.

Daskalakis, N. and Psillaki, M. (2008), Do country or firm factors explain capital structure? Evidence from SMEs in France and Greece. *Applied Financial Economics,* 18 (2): 87–97.

Davidson, W. N. and Dutia, D. (1991), Debt, liquidity, and profitability problems in small firms. *Entrepreneurship Theory and Practice,* 16 (1): 53–64.

Davidsson, P. (1989), Entrepreneurship – And after? A study of growth willingness in small firms. *Journal of Business Venturing,* 4 (3): 211–226.

Davidsson, P. and Wiklund, J. (2001), Levels of analysis in entrepreneurship research: Current research practice and suggestions for the future. *Entrepreneurship Theory and Practice,* 25 (4): 81–99.

Davidsson, P. and Wilkund, J. (2000), Conceptual and empirical challenges in the study of firm growth. In: Sexton, D. L. and Landstrom, H. (eds.) *Handbook of entrepreneurship.* Oxford: Blackwell Publishing.

Davidsson, P., Lindmark, L. and Olofsson, C. (1999), SMEs and job creation during a recession and recovery. In: Acs, Z., Carlsson, B. and Karlsson, C. (eds.) *Entrepreneurship, small and medium-sized enterprises and the macroeconomy.* Cambridge: Cambridge University Press.

Day, T. E., Stoll, H. R. and Whaley, R. E. (1983), *Taxes, financial policy and small business.* Lexington: Lexington Books.

De Bettignies, J. E. and Brander, J. A. (2007), Financing entrepreneurship: Bank finance versus venture capital. *Journal of Business Venturing,* 22 (6): 808–832.

De Jong, A. and Van Dijk, R. (2007), Determinants of leverage and agency problems: A regression approach with survey data. *The European Journal of Finance,* 13 (6): 565–593.

De Meza, D. and Webb, D. C. (1987), Too much investment: A problem of asymmetric information. *The Quarterly Journal of Economics,* 102 (2): 281–292.

De Meza, D. and Webb, D. C. (2000), Does credit rationing imply insufficient lending? *Journal of Public Economics,* 78 (3): 215–234.

DeAngelo, H. and Masulis, R. (1980), Optimal capital structure under corporate and personal taxation. *Journal of Financial Economics,* 8 (1): 5–29.

Department of Enterprise, Trade and Employment (1992), *Equity capital survey of Irish indigenous industry*. Dublin: The Stationery Office.

Department of Enterprise, Trade and Employment (1995), *Equity capital survey 1995*. Dublin: The Stationery Office.

Department of Enterprise, Trade and Employment (2002), *Equity capital survey 2002*. Dublin: The Stationery Office.

Desai, M. A., Foley, C. F. and Hines Jr., J. R. (2004), A multinational perspective on capital structure choice and internal capital markets. *Journal of Finance,* 59 (6): 2451–2487.

Descartes, R. (1641, 1931), Meditations on first philosophy. In: *The philosophical works of Descartes*, Volume 1. London: Dover.

Diamond, D. W. (1989), Reputation acquisition in debt markets. *Journal of Political Economy,* 97 (4): 828–862.

Dillman, D. (2007), *Mail and internet surveys. The tailored design method*, 2nd edition. Hoboken: Wiley.

Duncan, W. J. (1979), Mail questionnaires in survey research: A review of response inducement techniques. *Journal of Management,* 5 (1): 39–55.

Ebben, J. and Johnson, A. (2006), Bootstrapping in small firms: An empirical analysis of change over time. *Journal of Business Venturing,* 21 (6): 851–865.

Ekanem, I. (2005), 'Bootstrapping': The investment decision-making process in small firms. *The British Accounting Review,* 37 (3): 299–318.

Elsas, R. and Krahnen, J. P. (1998), Is relationship lending special? Evidence from credit-file data in Germany. *Journal of Banking and Finance,* 22 (10–11): 1283–1316.

Elston, J. A. and Audretsch, D. B. (2009), Financing the entrepreneurial decision: an empirical approach using experimental data on risk attitudes. *Small Business Economics*, (forthcoming).

Enterprise Ireland (2006), Seed and venture capital programme 2000–2006. 2006 report. Viewed 23 November 2007, http://www.enterprise-ireland.com/nr/rdonlyres/c53478cf-0aa1-4e9b-830f-03375f2cd322/0/seedreport2006.pdf

Esperanca, J. P., Gama, A. P. M. and Gulamhussen, M. A. (2003), Corporate debt policy of small firms: An empirical (re) examination. *Journal of Small Business and Enterprise Development,* 10 (1): 62–80.

European Commission (2003), Commission recommendation of 6 May 2003 concerning the definition of small and medium-sized enterprises. Official Journal L 124 2003/361/EC, Brussels.

European Commission (2007), Survey of the Observatory of European SMEs – Summary. Flash Eurobarometer series no. 196. Viewed 21 July 2008, http://www.ec.europa.eu/enterprise/enterprise_policy/analysis/doc/2007/02_summary_en.pdf.

Eurostat (2008), Statistics in focus. Report 31/2008 prepared by Schmiemann, M. for Eurostat. Luxembourg: Office for Official Publications of the European Communities.

Evans, D. S. (1987), The relationship between firm growth, size, and age: Estimates for 100 manufacturing industries. *The Journal of Industrial Economics,* 35 (4): 567–581.

Evans, D. S. and Jovanovic, B. (1989), An estimated model of entrepreneurial choice under liquidity constraints. *Journal of Political Economy,* 97 (4): 808–827.

Fairlie, R. W. (1999), The absence of the African-American owned business: An analysis of the dynamics of self-employment. *Journal of Labor Economics,* 17 (1): 80–108.

Fama, E. F. and French, K. R. (1998), Taxes, financing decisions and firm value. *The Journal of Finance,* LIII (3): 819–843.

Fama, E. F. and French, K. R. (2002), Testing trade-off and pecking order predictions about dividends and debt. *Review of Financial Studies,* 15 (1): 1–33.

Faria, A. J. and Dickinson, J. R. (1992), Mail survey response, speed, and cost. *Industrial Marketing Management,* 21 (1): 51–60.

Faria, A. J. and Dickinson, J. R. (1996), The effect of reassured anonymity and sponsor on mail survey response rate and speed with a business population. *Journal of Business and Industrial Marketing,* 11 (1): 66–76.

Fazzari, S. M., Hubbard, R. G. and Petersen, B. C. (1988), Financing constraints and corporate investment. *Brookings Papers on Economic Activity,* (1): 141–206.

Fazzari, S. M., Hubbard, R. G. and Petersen, B. C. (2000), Investment-cash flow sensitivities are useful: A comment on Kaplan and Zingales. *Quarterly Journal of Economics,* 115 (2): 695–705.

Fisman, R. and Love, I. (2003), Trade credit, financial intermediary development, and industry growth. *The Journal of Finance,* 58 (1): 353–374.

Fitzpatrick Associates (2001), *Small business failure in Ireland*. Dublin: Report to the Department of Enterprise, Trade, and Employment.

Fitzsimmons, J. R. and Douglas, E. J. (2006), Entrepreneurs and funding decisions: Evidence from Australian SMEs. *International Journal of Entrepreneurship and Small Business,* 3 (1): 76–91.

Fitzsimons, P. and O' Gorman, C. (2007), *The global entrepreneurship monitor 2006: The Irish report*. Dublin City University: Business School.

Flannery, M. and Rangan, K. P. (2006), Partial adjustment toward target capital structures. *Journal of Financial Economics*, 79 (3): 469–506.

Fluck, Z., Holtz-Eakin, D. and Rosen, H. S. (1998), *Where does the money come from ? The financing of small entrepreneurial enterprises*. Metropolitan Studies Program Series, occasional paper 191, Center for Policy Research, Maxwell School of Citizenship and Public Affairs, Syracuse University.

Forfás (2006), SME finance and equity survey. Viewed 20 July 2007, http://www.forfas.ie/publications/forfas061129/forfas061129_sme_finance_equity_survey.pdf

Forsaith, D. M. and McMahon, R. G. P. (2002), *Equity financing patterns amongst Australian manufacturing SMEs*. Research paper series 02-6, The Flinders University of South Australia School of Commerce.

Fox, R. J., Crask, M. R. and Kim, J. (1988), Mail survey response rate: A meta-analysis of selected techniques for inducing response. *Public Opinion Quarterly,* 52 (4): 467–491.

Frame, W. S., Srinivasan, A. and Woosley, L. (2001), The effect of credit scoring on small-business lending. *Journal of Money, Credit and Banking,* 33 (3): 813–825.

Frank, M. Z. and Goyal, V. K. (2003), Testing the pecking order theory of capital structure. *Journal of Financial Economics,* 67 (2): 217-248.

Frank, M. Z. and Goyal, V. K. (2005), Trade-off and pecking order theories of debt. In: Eckbo, B. E. (ed.) *Handbook of corporate finance: Empirical corporate finance*. North Holland: Elsevier.

Fritsch, M. (1993), The role of small firms in West Germany. In: Acs, Z. J. and Audretsch, D. B. (eds.) *Small firms and entrepreneurship: An East-West perspective*. Cambridge: Cambridge University Press.

Fritsch, M. and Mueller, P. (2008), The effect of new business formation on regional development over time: The case of Germany. *Small Business Economics,* 30 (1): 15–29.

Fu, T. W., Ke, M. C. and Huang, Y. S. (2002), Capital growth, financing source and profitability of small businesses: Evidence from Taiwan small enterprises. *Small Business Economics,* 18 (4): 257–267.

Gallo, M. A., Tapies, J. and Cappuyns, K. (2004), Comparison of family and nonfamily business: Financial logic and personal preferences. *Family Business Review,* 17 (4): 303–318.

Garcia-Teruel, P. J. and Martinez-Solano, P. (2007), Short-term debt in Spanish SMEs. *International Small Business Journal,* 25 (6): 579–602.

Garmaise, M. J. (2001), *Informed investors and the financing of entrepreneurial projects*. Paper presented at the European Financial Management Association (EFMA) Lugano Meetings, 27–30 June.

Gartner, W. B. and Birley, S. (2002), Introduction to the special issue on qualitative methods in entrepreneurship research. *Journal of Business Venturing,* 17 (5): 387–395.

Ghosh, S. (2007), Bank debt use and firm size: Indian evidence. *Small Business Economics,* 29 (1–2): 15–23.

Giaoutzi, M., Nijkamp, P. and Storey, D. (1988), Small is beautiful – The regional importance of small-scale activities. In: Giaoutzi, M., Nijkamp, P. and Storey, D. (eds.) *Small and medium enterprises and regional development*. London: Routledge.

Giudici, G. and Paleari, S. (2000), The provision of finance to innovation: A survey conducted among Italian technology-based small firms. *Small Business Economics,* 14 (1): 37–53.

Gompers, P. A. (1995), Optimal investment, monitoring, and the staging of venture capital. *The Journal of Finance,* 50 (5): 1461–1489.

Gompers, P. A. (1999), Resource allocation, incentives and control: The importance of venture capital in financing entrepreneurial firms. In: Acs, Z., Carlsson, B. and Karlsson, C. (eds.) *Entrepreneurship, small and medium-sized enterprises and the macroeconomy*. Cambridge: Cambridge University Press.

Gompers, P. A. and Lerner, J. (2003), Equity financing. In: Acs, Z. and Audretsch, D. B. (eds.) *Handbook of entrepreneurship research: An interdisciplinary survey and introduction*. New York: Springer.

Gorton, G. and Kahn, J. (2000), The design of bank loan contracts. *The Review of Financial Studies,* 13 (2): 331–364.

Graham, J. R. (2000), How big are the tax benefits of debt? *Journal of Finance,* 55 (5): 1901–1941.

Graham, J. R. (2003), Taxes and corporate finance: A review. *The Review of Financial Studies,* 16 (4): 1075–1129.

Graham, J. R. (2004), Roundtable on corporate disclosure. *Journal of Applied Corporate Finance,* 16 (4): 338–362.

Graham, J. R. and Harvey, C. R. (2001), The theory and practice of corporate finance: Evidence from the field. *Journal of Financial Economics,* 60 (2–3): 187–243.

Grant, P. and Perren, L. (2002), Small business and entrepreneurial research. Meta-theories, paradigms and prejudices. *International Small Business Journal,* 20 (2): 185–209.

Gregory, B. T., Rutherford, M. W., Oswald, S. and Gardiner, L. (2005), An empirical investigation of the growth cycle theory of small firm financing. *Journal of Small Business Management,* 43 (4): 382–392.

Greiner, L. E. (1972), Evolution and revolution as organizations grow. *Harvard Business Review,* 50 (4): 37–46.

Guba, E. G., and Lincoln, Y. S. (1994), Competing paradigms in qualitative research. In: Denzin, N. K. and Lincoln, Y. S. (eds.) *Handbook of qualitative research*. Thousand Oaks: Sage.

Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E. and Tatham, R. L. (2006), *Multivariate data analysis*, 6th edition. Upper Saddle River: Pearson Prentice Hall.

Hall, G. (1989), Lack of finance as a constraint on the expansion of innovatory small firms. In: Barber, J., Metcalf, J. S. and Porteus, M. (eds.) *Barriers to growth in small firms*. London: Routledge.

Hall, B. H. (2002), The financing of research and development. *Oxford Review of Economic Policy,* 18 (1): 35–51.

Hall, G., Hutchinson, P. J. and Michaelas, N. (2000), Industry effects on the determinants of unquoted SMEs' capital structure. *International Journal of the Economics of Business,* 7 (3): 297–312.

Hall, G., Hutchinson, P. and Michaelas, N. (2004), Determinants of the capital structures of European SMEs. *Journal of Business Finance and Accounting,* 31 (5–6): 711–728.

Hamilton, R. T. and Fox, M. A. (1998), The financing preferences of small firm owners. *International Journal of Entrepreneurial Behaviour and Research,* 4 (3): 239–248.

Hand, J. H., Lloyd, W. P. and Rogow, R. B. (1982), Agency relationships in the close corporation. *Financial Management,* 11 (1): 25–30.

Hanks, S. H., Watson, C. J., Jansen, E. and Chandler, G. N. (1994), Tightening the life cycle construct: A taxonomic study of growth stage configurations in high-technology organisations. *Entrepreneurship Theory and Practice,* 18 (2): 5–29.

Hanley, A. and Crook, J. (2005), The role of private knowledge in reducing the information wedge: A research note. *Journal of Business Finance and Accounting,* 32 (1–2): 415–433.

Hanley, A. and Girma, S. (2006), New ventures and their credit terms. *Small Business Economics,* 26 (4): 351–364.

Harhoff, D. and Korting, T. (1998), Lending relationships in Germany: Empirical evidence from survey data. *Journal of Banking and Finance,* 22 (10–11): 1317–1353.

Harris, M. and Raviv, A. (1990), Capital structure and the informational role of debt. *The Journal of Finance,* XLV (2): 321–349.

Harris, M. and Raviv, A. (1991), The theory of capital structure. *The Journal of Finance,* XLVI (1): 297–355.

Heberlein, T. A. and Baumgartner, R. (1978), Factors affecting response rates to mailed questionnaires: A quantitative analysis of the published literature. *American Sociological Review,* 43 (4): 447–462.

Heyman, D., Deloof, M. and Ooghe, H. (2008), The financial structure of private held Belgian firms. *Small Business Economics,* 30 (3): 301–313.

Hogan, T. (2004), The financing of new technology-based firms in the Irish software product sector. *Unpublished Doctoral Book, Department of Banking and Finance*. Dublin, University College Dublin.

Hogan, T. and Hutson, E. (2005), Capital structure in new technology-based firms: Evidence from the Irish software sector. *Global Finance Journal,* 15 (3): 369–387.

Holmes, S. and Kent, P. (1991), An empirical analysis of the financial structure of small and large Australian manufacturing enterprises. *The Journal of Small Business Finance,* 1 (2): 141–154.

Holmes, S. and Zimmer, I. (1994), The nature of the small firm: Understanding the motivations of growth and non-growth oriented owners. *Australian Journal of Management,* 19 (1): 97–120.

Howorth, C. A. (2001), Small firms' demand for finance: A research note. *International Small Business Journal,* 19 (4): 78–86.

Hubbard, R. G. (1997), Tax policy and investment. In: Auerbach, A. J. (ed.) *Fiscal policy: Lessons from economic research*. Cambridge: MIT Press.

Hudson, M., Smart, A. and Bourne, M. (2001), Theory and practice in SME performance measurement systems. *International Journal of Operations and Production Management,* 21 (8): 1096–1115.

Hughes, A. (1997), Finance for SMEs: A U.K. perspective. *Small Business Economics,* 9 (2): 151–166.

Hussain, J. and Matlay, H. (2007), Financing preferences of ethnic minority owner/managers in the UK. *Journal of Small Business and Enterprise Development,* 14 (3): 487–500.

Huyghebaert, N. and Van De Gucht, L. M. (2007), The determinants of financial structure: New insights from business start-ups. *European Financial Management,* 13 (1): 101–133.

Hyytinen, A. and Vaananen, L. (2006), Where do financial constraints originate from? An empirical analysis of adverse selection and moral hazard in capital markets. *Small Business Economics,* 27 (4–5): 323–348.

Ibbotson, R. G., Sindelar, J. L. and Ritter, J. (2001), Initial public offerings. In: Chew, D. H. J. (ed.) *The new corporate finance. Where theory meets practice*, 3rd edition. New York: McGraw Hill-Irwin.

Irish Banking Federation (IBF) (2006), *Business account switching code*. Viewed 20 July 2007, http://www.ibf.ie/pdfs/codes/IBF%20Business%20Switching%20Code.pdf.

Irish Revenue Commissioners (2007), *The Business Expansion Scheme (BES) – Relief for investment in corporate trades*. Viewed 30 June 2008, http://www.revenue.ie/index.htm?/publications/bes-scs.htm

Irish Stock Exchange (2007), *Irish Enterprise Exchange*. Viewed 11 December 2007, http://www.ise.ie/index.asp?locID=421&docID=-1.

Irish Venture Capital Association Techpulse (2007), Viewed 14 July 2008, http://www.ivca.ie/documents/IVCA07TechpulsePublished0308at150908.xls.

Irish Venture Capital Association (IVCA) (2006), The economic impact of venture capital in Ireland 2005. Viewed 14 July 2008, http://www.ivca.ie/.

Jarvis, R., Curran, J., Kitching, J. and Lightfoot, G. (2000), The use of quantitative and qualitative criteria in the measurement of performance in small firms. *Journal of Small Business and Enterprise Development,* 7 (2): 123–134.

Jensen, M. C. and Meckling, W. H. (1976), Theory of the firm: Managerial behaviour, agency costs and ownership structure. *Journal of Financial Economics,* 3 (4): 305–360.

Jobber, D., Saunders, J. and Mitchell, V. W. (2004), Prepaid monetary incentive effects on mail survey response. *Journal of Business Research,* 57 (1): 21–25.

Johnsen, P. C. and McMahon, R. G. P. (2005), Cross-industry differences in SME financing behaviour: An Australian perspective. *Journal of Small Business and Enterprise Development,* 12 (2): 160–177.

Jones-Evans, D. (1996), Irish entrepreneurship research: The way forward. Paper presented at the conference "Management research in Ireland: The way forward", University College Cork, 12–13 September.

Jordan, J., Lowe, J. and Taylor, P. (1998), Strategy and financial policy in UK small firms. *Journal of Business Finance and Accounting,* 25 (1–2): 1–27.

Karine, E. M., Frank, L. and Laine, K. (2004), Effect of price on the diffusion of cellular subscriptions in Finland. *Journal of Product and Brand Management,* 13 (3): 192–199.

Karmel, S. M. and Bryon, J. (2002), *A comparison of small and medium sized enterprises in Europe and in the USA*. London: Routledge.

Keasey, K. and Watson, R. (1993), *Small firm management. Ownership, finance and performance*. Oxford: Blackwell.

Keasey, K. and Watson, R. (2000), Interest rate premia on UK small firm bank borrowings: A research note. *Journal of Business Finance and Accounting,* 27 (1–2): 247–259.

Kennedy, K. A. and Healy, T. (1985), *Small-scale manufacturing industry in Ireland.* Paper no. 125. Dublin: The Economic and Social Research Institute (ESRI).

Kim, Y. C. and Stulz, R. (1988), The Eurobond market and corporate financial policy : A test of the clientele hypothesis. *Journal of Financial Economics,* 22 (2): 189–205.

Kimberly, J. R. and Miles, R. H. (1980), Preface. In: Kimberly, J. R., Miles, R. H. and Associates (eds.) *The organizational life cycle: Issues in the creation, transformation, and decline of organizations*. San Francisco: Jossey-Bass Inc.

Kinsella, R., Clarke, W. M., Storey, D. J., Mulvenna, D. and Coyne, D. (1994), *Fast-growth small firms: An Irish perspective*. Dublin: Irish Management Institute.

Kitching, J. (1994), Employers' work-force construction policies in the small service sector enterprise. In: Atkinson, J. and Storey, D. (eds.) *Employment, the small firm and the labour market*. London: Routledge.

Klomp, L. and Thurik, R. (1999), Job flows of firms in traditional services. In: Acs, Z., Carlsson, B. and Karlsson, C. (eds.) *Entrepreneurship, small and medium-sized enterprises and the macro-economy*. Cambridge: Cambridge University Press.

Kon, Y. and Storey, D. J. (2003), A theory of discouraged borrowers. *Small Business Economics,* 21 (1): 37–49.

Korwar, A. N. and Masulis, R. W. (1986), Seasoned equity offerings: An empirical investigation. *Journal of Financial Economics*, 15 (1–2): 91–118.

Kotey, B. (1999), Debt financing and factors internal to the business. *International Small Business Journal,* 17 (3): 11–29.

Kuratko, D. F., Hornsby, J. S. and Nafizinger, D. W. (1997), An examination of owner's goals in sustaining entrepreneurship. *Journal of Small Business Management,* 35 (1): 24–33.

Lambrecht, B. M. and Myers, S. (2007), Debt and managerial rents in a real-options model of the firm. Paper presented to the Global Finance Academy mini-conference, Institute of Bankers, Citigroup Building, International Financial Services Centre, Dublin, 19 June.

Leach, J. C. and Melicher, R. W. (2006), *Entrepreneurial finance*, 2nd edition. Mason: Thomson South-Western.

Lecornu, M. R., McMahon, R. G. P., Forsaith, D. M. and Stanger, A. M. J. (1996), The small enterprise financial objective function. *Journal of Small Business Management,* 34 (3): 1–14.

Leeth, J. D. and Scott, J. A. (1989), The incidence of secured debt: Evidence from the small business community. *Journal of Financial and Quantitative Analysis,* 24 (3): 379–394.

Leland, H. E. and Pyle, D. H. (1977), Informational asymmetries, financial structure, and financial intermediation. *The Journal of Finance,* 32 (2): 371–387.

Lenihan, H. (2002), Evaluating the effects of Irish industrial policy: Estimating predictive (logit) models for deadweight and displacement. Paper presented at the International conference on policy modelling (EcoMod), Brussels, 4–6 July.

Levenson, A. R. and Willard, K. L. (2000), Do firms get the financing they want? Measuring credit rationing experienced by small businesses in the U.S. *Small Business Economics,* 14 (2): 83–94.

Long, M. S. and Malitz, I. B. (1985), Investment patterns and financial leverage. In: Friedman, B. (ed.) *Corporate capital structures in the United States*. Chicago: University of Chicago Press.

Lopez-Gracia, J. and Aybar-Arias, C. (2000), An empirical approach to the financial behaviour of small and medium sized companies. *Small Business Economics,* 14 (1): 55–63.

Lopez-Gracia, J. and Sanchez-Andujar, S. (2007), Financial structure of the family business: Evidence from a group of small Spanish firms. *Family Business Review,* 20 (4): 269–287.

López-Gracia, J. and Sogorb-Mira, F. (2008), Testing trade-off and pecking order theories financing SMEs. *Small Business Economics,* 31 (2): 117–136.

Mac an Bhaird, C. and Lucey, B. (2010), Determinants of capital structure in Irish SMEs. *Small Business Economics*, (forthcoming).

MacMillan Committee (1931), *Report of the committee on finance and industry*. Cmnd. 3897, London: HMSO.

Maherault, L. (2000), The influence of going public on investment policy: An empirical study of French family-owned businesses. *Family Business Review,* 13 (1): 71–79.

Manigart, S. and Struyf, C. (1997), Financing high technology startups in Belgium: An explorative study. *Small Business Economics,* 9 (2): 125–135.

Manigart, S., Wright, M., Robbie, K., Desbrieres, P. and De Waele, K. (1997), Venture capitalists' appraisal of investment projects: An empirical European study. *Entrepreneurship: Theory and Practice,* 21 (4): 29–43.

Mann, R. J. (1997a), Explaining the pattern of secured credit. *Harvard Law Review,* 110 (3): 625–683.

Mann, R. J. (1997b), The role of secured credit in small business lending. *The Georgetown Law Journal,* 86 (1): 1–44.

Manove, M., Padilla, A. J. and Pagano, M. (2001), Collateral versus project screening: A model of lazy banks. *RAND Journal of Economics,* 32 (4): 726–744.

McCarthy and Associates (2002), *Competition needed in the Irish banking market*. Viewed 10 December 2007, http://www.financialconsultants.ie/Files/Newsletter/Sept%2003.doc.

Mc Nally, J. (2007), A greater scheme for business. *The Investor*, May: 55–57.

McConaugby, D. L., Matthews, C. H. and Fialko, A. S. (2001), Founding family controlled firms: Performance, risk, and value. *Journal of Small Business Management,* 39 (1): 31–49.

McConnell, J. J. and Pettit, R. R. (1984), Application of the modern theory of finance to small business firms. In: Horvitz, P. M. and Pettit, R. R. (eds.) *Small business finance*. Greenwich: JAI Press.

McIntyre, M. J. (2008), *The deduction of interest payments in an ideal tax on realized business profits*. Research paper no. 08-21, Wayne State University Law School.

McMahon, R. G. P. and Stanger, A. M. J. (1995), Understanding the small enterprise financial objective function. *Entrepreneurship Theory and Practice,* 19 (4): 21–39.

McMahon, R. G. P., Holmes, S., Hutchinson, P. J. and Forsaith, D. M. (1993), *Small enterprise financial management: Theory and practice*. Sydney: Harcourt Brace.

Michaelas, N., Chittenden, F. and Poutziouris, P. (1998), A model of capital structure decision making in small firms. *Journal of Small Business and Enterprise Development,* 5 (3): 246–260.

Michaelas, N., Chittenden, F. and Poutziouris, P. (1999), Financial policy and capital structure choice in UK SMEs: Empirical evidence from company panel data. *Small Business Economics,* 12 (2): 113–130.

Miller, M. H. (1977), Debt and taxes. *The Journal of Finance,* 32 (2): 261–276.

Miller, M. H. (1991), Leverage. *The Journal of Finance,* 46 (2): 479–488.

Mills, D. E. and Schumann, L. (1985), Industry structure with fluctuating demand. *American Economic Review,* 75 (4): 758–767.

Mishra, C. S. and McConaughy, D. L. (1999), Founding family control and capital structure: The risk of loss of control and the aversion to debt. *Entrepreneurship Theory and Practice,* 23 (4): 53–64.

Modigliani, F. and Miller, M. H. (1958), The cost of capital, corporation finance and the theory of investment. *The American Economic Review,* 48 (3): 261–297.
Modigliani, F. and Miller, M. H. (1963), Corporate income taxes and the cost of capital: A correction. *American Economic Review,* 53 (3): 433–443.
Mueller, P., Van Stel, A. and Storey, D. (2008), The effects of new firm formation on regional development over time: The case of Great Britain. *Small Business Economics,* 30 (1): 59–71.
Mulcahy, D. (2005), *Angels and IPOs: Policies for sustainable equity financing of Irish small businesses*. Studies in Public Policy no. 16, Trinity College Dublin: The Policy Institute.
Myers, S. C. (1977), Determinants of corporate borrowing. *Journal of Financial Economics,* 5 (2): 147–175.
Myers, S. C. (1984), The capital structure puzzle. *The Journal of Finance,* 39 (3): 575–592.
Myers, S. C. (2001), Capital structure. *Journal of Economic Perspectives,* 15 (2): 81–102.
Myers, S. C. and Majluf, N. S. (1984), Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics,* 13 (2): 187–221.
Myers, S., McConnell, J., Peterson, A., Soter, D. and Stern, J. (1998), Vanderbilt University roundtable on the capital structure puzzle. *Journal of Applied Corporate Finance,* 11 (1): 8–24.
National Economic and Social Council (NESC) (1984), *The role of the financial system in financing the traded sectors*. Dublin: The Stationery Office.
Nederhof, A. J. (1983a), The effect of material incentive in mail surveys: Two studies. *Public Opinion Quarterly,* 47 (1): 103–111.
Nederhof, A. J. (1983b), Effects of repetition and consistency of personalization treatments on response rate in mail surveys. *Social Science Research,* 12 (1): 1–9.
Nederhof, A. J. (1988), Effects of a final telephone reminder and questionnaire cover design in mail surveys. *Social Science Research,* 17 (4): 353–361.
Newby, R., Watson, J. and Woodliff, D. (2003), SME survey methodology: Response rates, data quality, and cost effectiveness. *Entrepreneurship Theory and Practice,* 28 (2): 163–172.
Norton, E. (1990), Similarities and differences in small and large corporation beliefs about capital structure policy. *Small Business Economics,* 2 (3): 229–245.
Norton, E. (1991), Capital structure and small growth firms. *The Journal of Small Business Finance,* 1 (2): 161–177.
O' Brien, F. and O' Loughlin, B. (2006), *Developing pension fund investment strategy: Adding value and diversity through Irish venture capital*. Viewed 8 November 2007, http://www.ivca.ie/ivca_pensionsreport.html.
O' Connor, F. (2005), Wallace's dolce vita. *Business and Finance*, 16–30 June: 42–45.
O' Gorman, C. and Fitzsmions, P. (2007), Entrepreneurial activity in Ireland: Evidence from the Global Entrepreneurship Monitor. *The Irish Journal of Management,* 28 (2): 29–50.
O' Gorman, C. and Terjesen, S. (2006), Financing the Celtic tigress: Venture financing and informal investment in Ireland. *Venture Capital,* 8 (1): 69–88.
Ó Gráda, C. (1997), *A rocky road: The Irish economy since the 1920s*. Manchester: Manchester University Press.
O' Malley, E. and O' Gorman, C. (2001), Competitive advantage in the Irish indigenous software industry and the role of inward foreign direct investment. *European Planning Studies,* 9 (3): 303–321.
Oakey, R. P. (1984), Finance and innovation in British small independent firms. *Omega International Journal of Management Science,* 12 (2): 113–124.
Oppenheim, A. N. (1966), *Questionnaire design and attitude measurement*. London: Heinemann.
Organisation for Economic Cooperation and Development (OECD) (2006), *The SME financing gap: Theory and evidence*. Volume 1. Paris: OECD Publishing.
Organisation for Economic Cooperation and Development (OECD) (2008), Viewed 28 July 2008, http://www.oecd.org/document/60/0,3343,en_2649_34897_1942460_1_1_1_1,0 0.html#table_II1.
Ortiz-Molina, H. and Penas, M. (2008), Lending to small businesses: The role of loan maturity in addressing information problems. *Small Business Economics,* 30 (4): 361–383.

Ortqvist, D., Masli, E. K., Rahman, S. F. and Selvarajah, C. (2006), Determinants of capital structures in new ventures: Evidence from Swedish longitudinal data. *Journal of Developmental Entrepreneurship,* 11 (4): 277–296.

Ou, C. and Haynes, G. W. (2003), *Uses of equity capital by small firms: Findings from the surveys of small business finances (for 1993 and 1998)*, Paper presented at the 14th annual conference on entrepreneurial finance and business ventures, De Paul University, Chicago, Illinois, 30 April–02 May.

Ou, C. and Haynes, G. W. (2006), Acquisition of additional equity capital by small firms: Findings from the national survey of small business finances. *Small Business Economics,* 27 (2–3): 157–168.

Parker, S. C. (2002), Do banks ration credit to new enterprises? And should governments intervene? *Scottish Journal of Political Economy,* 49 (2): 162–195.

Paul, S., Whittam, G. and Wyper, J. (2007), The pecking order hypothesis: Does it apply to start-up firms? *Journal of Small Business and Enterprise Development,* 14 (1): 8–21.

Penrose, E. T. (1952), Biological analogies in the theory of the firm. *American Economic Review,* 42 (5): 804–819.

Penrose, E. T. (1959), *The theory of the growth of the firm*. New York: Wiley.

Petersen, M. A. and Rajan, R. G. (1994), The benefits of lending relationships: Evidence from small business data. *The Journal of Finance,* XLIX (1): 3–37.

Peterson, R. and Schulman, J. (1987), Capital structure of growing small firms: A 12 country study on becoming bankable. *International Small Business Journal,* 5 (4): 10–22.

Pettit, R. R. and Singer, R. F. (1985), Small business finance: A research agenda. *Financial Management,* 14 (3): 47–60.

Porter, M. E. (1998), Clusters and the new economics of competition. *Harvard Business Review,* 76 (6): 77–90.

Poutziouris, P. Z. (2001), The views of family companies on venture capital: Empirical evidence from the UK small to medium-size enterprising economy. *Family Business Review,* 14 (3): 277–291.

Poutziouris, P. Z. (2002), The finanical affairs of smaller family companies. In: Fletcher, D. E. (ed.) *Understanding the small family business*. London: Routledge.

Poutziouris, P. (2003), The strategic orientation of owner-managers of small ventures. *International Journal of Entrepreneurial Behaviour and Research,* 9 (5): 185–214.

Pricewaterhouse Coopers (2005), *Money for growth: The European technology investment report 2005*. Viewed 11 July 2008, http://www.pwc.com/ie/eng/ins-sol/publ/pwc_money_for_growth_2005.pdf.

Radcliffe Committee (1959), *Report on the working of the monetary system*. Cmnd 827, London: HMSO.

Rafuse, M. E. (1996), Working capital management: An urgent need to refocus. *Management Decision,* 34 (2): 59–63.

Rajan, R. G. (1992), Insiders and outsiders: The choice between informed and arm's-length debt. *The Journal of Finance,* XLVII (4): 1367–1400.

Rajan, R. and Winton, A. (1995), Covenants and collateral as incentives to monitor. *Journal of Finance,* 50 (4): 1113–1146.

Rajan, R. G. and Zingales, L. (1995), What do we know about capital structure? Some evidence from international data. *The Journal of Finance,* 50 (5): 1421–1460.

Ray, G. H. and Hutchinson, P. J. (1983), *The financing and financial control of small enterprise development*. Aldershot: Gower.

Reid, G. C. (1991), Staying in business. *International Journal of Industrial Organization,* 9 (4): 545–556.

Reid, G. C. (1996), Mature micro-firms and their experience of funding shortages. *Small Business Economics,* 8 (1): 27–37.

Reid, G. C. (2003), Trajectories of small business financial structure. *Small Business Economics,* 20 (4): 273–285.

Reid, G. C. and Jacobsen, L. R. (1988), *The small entrepreneurial firm*. Aberdeen University Press.
Robb, A. M. (2002), Small business financing: Differences between young and old firms. *Journal of Entrepreneurial Finance and Business Ventures,* 7 (2002): 45–65.
Romano, C. A., Tanewski, G. A. and Smyrnios, K. X. (2001), Capital structure decision making: A model for family business. *Journal of Business Venturing,* 16 (3): 285–310.
Rosen, H. S. (1998), The future of entrepreneurial finance. *Journal of Banking and Finance,* 22 (6–8): 1105–1107.
Rosenthal, R. and Rosnow, R. L. (1991), *Essentials of behavioural research: Methods and data analysis*. London: McGraw Hill.
Ross, S. A. (1977), The determination of financial structure: The incentive-signalling approach. *Bell Journal of Economics,* Spring (1): 23–40.
Rostow, W. W. (1960), *The stages of economic growth*. Cambridge: Cambridge University Press.
Roure, J. (1997), Ten myths about entrepreneurs. In: Birley, S. and Muzyka (eds.) *Mastering enterprise*. London: Pitman Publishing.
Ryan, B., Scapens, R. W. and Theobald, M. (2002), *Research method and methodology in finance and accounting*, 2nd edition. London: Thomson.
Sahlman, W. A. (1990), The structure and governance of venture-capital organizations. *Journal of Financial Economics,* 27 (2): 473–521.
Salazar, M. (2007), *The effect of wealth and race on start-up rates*. Washington, D.C.: Small Business Association.
Schaefer, D. R. and Dillman, D. A. (1998), Development of a standard e-mail methodology. *Public Opinion Quarterly,* 62 (3): 378–397.
Scherer, F. (1991), Changing perspectives on the firm size problem. In: Acs, Z. and Audretsch, D. B. (eds.) *Innovation and technological change: An international comparison*. Ann Arbor: University of Michigan Press.
Scherr, F. C. and Hulburt, H. M. (2001), The debt maturity structure of small firms. *Financial Management,* 30 (1): 85–111.
Scherr, F. C., Sugrue, T. F. and Ward, J. B. (1993), Financing the small firm start-up: Determinants of debt use. *The Journal of Small Business Finance,* 3 (1): 17–36.
Schumacher, E. F. (1973), *Small is beautiful*. New York: Hartley and Marks Publishers.
Schumpeter, J. A. (1942), *Capitalism, socialism and democracy*. New York: Harper and Row.
Scott, M. and Rosa, P. (1996), Has firm level analysis reached its limits? Time for a rethink. *International Small Business Journal,* 14 (4): 81–89.
Shyam-Sunder, L. and Myers, S. C. (1999), Testing static trade-off against pecking order models of capital structure. *Journal of Financial Economics,* 51 (2): 219–244.
Simsek, Z. and Veiga, J. F. (2001), A primer on internet organizational surveys. *Organizational Research Methods,* 4 (3): 218–235.
Small Business Administration (2007), *The small business economy for data year 2006, A report to the president*. Washington D.C.: United States Government Printing Office.
Small Business Service (2006), *Annual small business survey 2005. Executive summary*. London: Department of Trade and Industry.
Smart, S. B., Megginson, W. L. and Gitman, L. J. (2007), *Corporate finance*, 2nd edition. Mason: Thomson South-Western.
Smith, R. L. and Smith, J. K. (2004), *Entrepreneurial finance*, 2nd edition. New York: Wiley.
Sogorb Mira, F. (2005), How SME uniqueness affects capital structure: Evidence from a 1994–1998 Spanish data panel. *Small Business Economics,* 25 (5): 447–457.
Sormani, A. (2006), Ireland: Expanding the investor base. *European Venture Capital Journal,* (134): 50–58.
Steinmetz, L. L. (1969), Critical stages of small business growth. *Business Horizons,* 12 (1): 29–36.
Stigler, S. M. (1981), Gauss and the invention of least squares. *The Annals of Statistics,* 9 (3): 465–474.

Stiglitz, J. E. and Weiss, A. (1981), Credit rationing in markets with imperfect information. *The American Economic Review,* 71 (3): 393–410.

Storey, D. J. (1994a), New firm growth and bank financing. *Small Business Economics,* 6 (2): 139–150.

Storey, D. J. (1994b), *Understanding the small business sector*. London: Routledge.

Storey, D. J., Watson, R. and Wynarczyk, P. (1989), *Fast growth businesses in Northern England*. Research paper no. 67, London: Department of Employment.

Storey, D. and Johnson, S. (1987), *Job generation and labour market change*. London: Macmillan.

Storey, D., Keasey, K., Watson, R. and Wynarczyk, P. (1987), *The performance of small firms*. London: Routledge.

Stulz, R. (1990), Managerial discretion and optimal financing policies *Journal of Financial Economics,* 26 (1): 3–27.

Tamari, M. (1980), The financial structure of the small firm. An international comparison of corporate accounts in the USA, France, UK, Israel and Japan. *American Journal of Small Business,* 4 (4): 20–34.

Tanaka, M. (2003), The macroeconomic implications of the new Basel accord. *CESifo Economic Studies,* 49 (2): 217–232.

Tashakkori, A. and Teddlie, C. (1998), *Mixed methodology. Combining qualitative and quantitative approaches*. Thousand Oaks: Sage Publications.

Tashakkori, A. and Teddlie, C. (2003), *Handbook of mixed methods in social and behavioural research*. Thousand Oaks: Sage Publications.

Titman, S. and Wessels, R. (1988), The determinants of capital structure choice. *The Journal of Finance,* XLIII (1): 1–19.

Ueda, M. (2004), Banks versus venture capital: Project evaluation, screening, and expropriation. *The Journal of Finance,* LIX (2): 601–621.

Ullah, F. and Taylor, P. (2005), The impact of science park and incubator location on the finance opportunities of technology-based small firms. In: During, W., Oakey, R. and Kauser, S. (eds.) *New technology-based firms in the new millenium*. Oxford: Elsevier.

Ullah, F. and Taylor, P. (2007), Are UK technology-based small firms still finance constrained? *The International Entrepreneurship and Management Journal,* 3 (2): 189–203.

Van Auken, H. E. and Holman, T. (1995), Financial strategies of small, public firms: A comparative analysis with small, private firms and large, public firms. *Entrepreneurship Theory and Practice,* 20 (1): 29–41.

Van Auken, H. E. and Neeley, L. (1996), Evidence of bootstrap financing among small start-up firms. *Journal of Entrepreneurial and Small Business Finance,* 5 (3): 233–248.

Van Der Wijst, N. and Thurik, R. (1993), Determinants of small firm debt ratios: An analysis of retail panel data. *Small Business Economics,* 5 (1): 55–65.

Van Stel, A. and Suddle, K. (2008), The impact of new firm formation on regional development in the Netherlands. *Small Business Economics,* 30 (1): 31–47.

Vanacker, T. and Manigart, S. (2007), *Incremental financing decisions in high growth companies: Pecking order and debt capacity considerations*. Working paper series no. 2007-22, Vlerick Leuven Gent Management School.

Von Kalckrueth, U. and Murphy, E. (2004), *Financial constraints and capacity adjustment in the United Kingdom: Are small firms really different? Evidence from a large panel of survey data*. Paper presented to the Royal Economic Society Annual Conference, University of Wales Swansea, 5–7 April.

Voordeckers, W. and Steijvers, T. (2006), Business collateral and personal commitments in SME lending. *Journal of Banking and Finance,* 30 (11): 3067–3086.

Vos, E. and Forlong, C. (1996), The agency advantage of debt over the lifecycle of the firm. *Entrepreneurial and Small Business Finance,* 5 (3): 193–211.

Vos, E., Jia-Yuh Yeh, A., Carter, S. and Tagg, S. (2007), The happy story of small business financing. *Journal of Banking and Finance,* 31 (9): 2648–2672.

Voulgaris, F., Asteriou, D. and Agiomirgianakis, G. (2004), Size and determinants of capital structure in the Greek manufacturing sector. *International Review of Applied Economics,* 18 (2): 247–262.

Wald, J. K. (1999), How firm characteristics affect capital structure: An international comparison. *Journal of Financial Research,* 22 (2): 161–187.

Walker, E. W. and Petty, W. J. I. (1978), Financial differences between large and small firms. *Financial Management,* 7 (4): 61–66.

Walsh, J. (2005), Can ISE steal the AIM's thunder? *Business and Finance,* 24 February–10 March: 16–21.

Walsh, E. J. and Ryan, J. (1997), Agency and tax explanations of security issuance decisions. *Journal of Business Finance and Accounting,* 24 (7–8): 943–961.

Walsh, V., Niosi, J. and Mustar, P. (1995), Small-firm formation in biotechnology: A comparison of France, Britain and Canada. *Technovation,* 15 (5): 303–327.

Watson, R. and Wilson, N. (2002), Small and medium size enterprise financing: A note on some of the empirical implications of a pecking order. *Journal of Business Finance and Accounting,* 29 (3–4): 557–579.

Weaver, S. C. (1993), Why don't we just ask them? *Financial Practice and Education,* 3 (2): 11–13.

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 (2): 197–201.

Weston, J. F. and Brigham, E. F. (1970), *Managerial finance*, 3rd edition. Fort Worth, Texas: Dryden Press.

Willimack, D. K., Schuman, H., Pennell, B. E. and Lepkowski, J. M. (1995), Effects of a prepaid nonmonetary incentive on response rates and response quality in a face-to-face survey. *The Public Opinion Quarterly,* 59 (1): 78–92.

Wilson Committee (1979), *The financing of small firms. Interim report of the committee to review the functioning of financial institutions*. Cmnd 7503, London: HMSO.

Wilson, N. and Summers, B. (2002), Trade credit terms offered by small firms: Survey evidence and empirical analysis. *Journal of Business Finance and Accounting,* 29 (3–4): 317–351.

Winborg, J. and Landstrom, H. (2001), Financial bootstrapping in small businesses: Examining small business managers' resource acquisition behaviors. *Journal of Business Venturing,* 16 (3): 235–254.

Wolken, J. D. (1998), "New" data sources for research on small business finance. *Journal of Banking and Finance,* 22 (6–8): 1067–1076.

Wright, M. and Robbie, K. (1998), Venture capital and private equity: A review and synbook. *Journal of Business Finance and Accounting,* 25 (5–6): 521–570.

Wright, M., Thompson, S. and Robbie, K. (1992), Venture capital and management-led, leveraged buy-outs: A European perspective. *Journal of Business Venturing,* 7 (1): 47–71.

Wright, M., Robbie, K. and Ennew, C. (1997), Serial entrepreneurs. *British Journal of Management,* 8 (3): 251–168.

Zahra, S. (1995), Corporate entrepreneurship and financial performance: The case of management leveraged buy-outs. *Journal of Business Venturing,* 10 (3): 225–247.

Zellner, A. (1962), An efficient method of estimating seemingly unrelated regressions and tests for aggregation bias. *Journal of the American Statistical Association,* 57 (298): 348–368.

Zingales, L. (2000), In search of new foundations. *The Journal of Finance,* 55 (4): 1623–1653.

Zoppa, A. and McMahon, R. G. P. (2002), *Pecking order theory and the financial structure of manufacturing SMEs from Australia's business longitudinal survey*. Research paper no. 02-1, School of Commerce, The Flinders University of South Australia.

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