Available online at www.sciencedirect.com
SCIENCE DIRECT®

Global Finance Journal 15 (2005) 369–387

Global Finance Journal

Capital structure in new technology-based firms: Evidence from the Irish software sector

Teresa Hogan[a,*], Elaine Hutson[b,1]

[a]Dublin City University Business School, Dublin 9, Ireland
[b]University College Dublin Michael Smurfit Graduate School of Business, Blackrock, Co. Dublin, Ireland

Available online 31 December 2004

Abstract

Using a sample of 117 Irish software companies, we examine the capital structure of new technology-based firms. Consistent with the findings on financing for other small businesses, internal funds are the most important source of funding in new technology-based firms. However, in apparent contradiction to the pecking order hypothesis, the use of debt is rare and equity financing is the prime source of external finance. By questioning chief executive officers via survey on their perceptions and opinions on various financing issues, we are able to conclude that in many cases software firm founders prefer outside equity to debt. The dearth of debt in the capital structure of new technology-based firms cannot be wholly explained by financing constraints due to information asymmetries in the banking sector.

JEL classification: G24; G28; G37
Keywords: Capital structure, Pecking order hypothesis; SME; NTBF

1. Introduction

It is widely agreed that technology-based small and medium-sized enterprises (SMEs) are becoming increasingly important sources of employment generation and economic

* Corresponding author. Tel.: +353 1 700 8082.
E-mail addresses: teresa.hogan@dcu.ie (T. Hogan), elaine.hutson@ucd.ie (E. Hutson).
[1] Tel.: +353 1 716 8828.

1044-0283/$ - see front matter
doi:10.1016/j.gfj.2004.12.001

growth. These so-called new technology-based firms (NTBFs)[2] are important conduits for translating scientific knowledge into commercial products and processes, and play a vital role in the development and diffusion of innovation. Some of the world's largest technology companies—such as Apple, Dell, Gateway, Intel and Microsoft—all began as NTBFs in the United States less than 30 years ago. Although such 'super-successful' firms are less in evidence in Europe, the European Commission (2002) notes that European NTBFs generate significant employment, productivity and economic growth. The financing of NTBFs has consequently become an important issue around the world. A central concern has been that NTBFs may experience financing constraints, especially at start-up, that could impede their ability to grow and develop. Recent interest by policymakers, however, has not been matched by academic research on financing. This is primarily because financial data on NTBFs are not widely available, and owner-managers of SMEs are often reluctant to reveal private information on the financing of their firms.

In this study we examine the financing of NTBFs using a sample of 117 privately held Irish software companies. Ireland is one of the top two producers of software products in the world.[3] Irish-based manufacturers produce over 40 percent of all packaged software and 60 percent of all business software sold in Europe, and Ireland is the world's largest exporter of software services, generating over €8.5 billion in export revenue in 2000 (National Informatics Directorate, 2001). This remarkable performance is largely attributable to a number of multinational companies that have made Ireland their centre for European manufacturing and distribution. Over the past three decades, a robust indigenous software industry has grown up alongside the multinationals, engaged primarily in the development of highly specialised software products for export markets. It is these indigenous NTBFs that are the focus of our study. Our survey approach allowed us to source information directly from the founders of these firms on issues such as their motives for being in business, their financial goals, their preferred sources of finance, and their perceptions of asymmetries in debt and venture capital markets.

We begin by presenting the essential features of our sample of indigenous Irish NTBFs—age, size by annual turnover and employment, and sources of finance. We show that, consistent with the pecking order hypothesis (POH) of Myers (1984) and Myers and Majluf (1984), internal funds are the most important source of finance. We also find that these NTBFs use outside equity in preference to debt. While this finding appears to contradict the predictions of the POH, which tends to hold for SMEs in general, it corroborates the findings of Oakey (1984) and Roberts (1990, 1991) for US NTBFs, Moore (1994) for NTBFs in the UK, and more recently Hyytinen and Pajarinen (2002) for Finnish high-tech firms.

Does this near-absence of debt in the capital structure of Irish NTBFs result from financing constraints? It is well understood that bank lending to SMEs and NTBFs is associated with information asymmetries that give rise to adverse selection and moral

[2] NTBFs are defined by Little (1977) as independent ventures less than 25 years old that supply a product or service based on the exploitation of an invention or technological innovation.

[3] Ireland and the United States together accounted for more than 55 percent of OECD software exports in 2000.