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Working Paper

Government funding of small and medium-sized enterprises in Finland

ETLA Discussion Papers, No. 832

Provided in Cooperation with:

The Research Institute of the Finnish Economy (ETLA), Helsinki

Suggested Citation: Hyytinen, Ari; Väänänen, Lotta (2002) : Government funding of small and medium-sized enterprises in Finland, ETLA Discussion Papers, No. 832, The Research Institute of the Finnish Economy (ETLA), Helsinki

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Keskusteluaiheita – Discussion papers

No. 832

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GOVERNMENT FUNDING OF SMALL AND MEDIUM-SIZED ENTERPRISES IN FINLAND*

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HYYTINEN, Ari – VÄÄNÄNEN, Lotta, GOVERNMENT FUNDING OF SMALL AND MEDIUM-SIZED ENTERPRISES IN FINLAND. Helsinki: ETLA, Elinkeinoelämän Tutkimuslaitos, The Research Institute of the Finnish Economy, 2002, 50 p. (Keskusteluaiheita, Discussion Papers, ISSN 0781-6847; No. 832).

ABSTRACT: Not unlike elsewhere, the government in Finland has been keen to provide funding to Finnish firms, especially to small and medium-sized enterprises (SMEs). In this paper we review, in the light of the economic rationales for public efforts to finance SMEs, all of the government institutions providing SME funding in Finland and the objectives and tasks assigned to them. Using recently collected data on SMEs, we then explore what kinds of SMEs apply for and receive government funding in Finland. We find i) that the “rhetoric” on what the institutions are set to do is not fully in line with what the economic rationales suggest; ii) that the total amount of government funding awarded to SMEs has over the past four years grown quite rapidly and simultaneously with increases in the availability of external finance on the marketplace; and iii) that every third SME has applied for and received at least one type of government funding. Our econometric results suggest that overall, the characteristics of SMEs applying for and receiving different types of government funding are consistent with the official rhetoric and the general idea of what the different institutions are set to do. Our results highlight the importance of emphasizing selectivity in the provision of government funding to SMEs, as we also find some evidence that the fundamental screening problem of finding out SMEs truly in need for government funding is not addressed adequately in practice.

JEL: E50, G21, G24, G32

KEYWORDS: corporate finance, government funding, market failure, SME

HYYTINEN, Ari – VÄÄNÄNEN, Lotta, GOVERNMENT FUNDING OF SMALL AND MEDIUM-SIZED ENTERPRISES IN FINLAND. Helsinki: ETLA, Elinkeinoelämän Tutkimuslaitos, The Research Institute of the Finnish Economy, 2002, 50 s. (Keskusteluaiheita, Discussion Papers, ISSN 0781-6847; No. 832).

TIIVISTELMÄ: Kuten monissa muissakin maissa, valtio on Suomessa ollut varsin innokas tarjoamaan julkista rahoitusta suomalaisille yrityksille, erityisesti pienille ja keskisuurille (pk-) yrityksille. Tarkastelemme tässä tutkimuksessa taloustieteestä julkiselle yritysrahoitukselle löydettävissä olevien perusteluiden valossa kaikkia pk-yrityksille julkista rahoitusta tarjoavia valtion organisaatioita Suomessa sekä niille asetettuja tavoitteita ja tehtäviä. Käyttämällä uutta aineistoa suomalaisista pk-yrityksistä tutkimme myös sitä, minkälaiset pk-yritykset hakevat ja saavat julkista rahoitusta Suomessa. Tutkimuksemme osoittaa, i) että lainsäädännöstä ja muusta sääntelystä löytyvä ”retoriikka” siitä mitä eri julkista rahoitusta tarjoavat valtion organisaatiot on asetettu tekemään (ja mitä ne itse raportoivat tehtävistään ja toiminnastaan) ei ole täysin linjassa taloustieteestä löydettävissä olevien perusteluiden kanssa; ii) että pk-yrityksille myönnetyn julkisen rahoituksen kokonaismäärä on viimeisen neljän vuoden aikana kasvanut melko nopeasti ja nähtävästi samanaikaisesti markkinaehtoisen ulkoisen rahoituksen saatavuuden kanssa; iii) että joka kolmas pk-yritys on tähän mennessä hakenut ja saanut rahoitusta vähintäänkin yhdeltä julkista rahoitusta tarjoavalta valtion organisaatiolta. Ekonometriset tuloksemme viittaavat siihen, että kokonaisuutena tarkasteltuna erityyppistä julkista rahoitusta saavien ja hakevien pk-yritysten ominaisuudet ovat yhdenmukaisia virallisen ”retoriikan” kanssa, ja sen kanssa mitä ko. organisaatioiden ”tulisi-kin tehdä”. Tuloksemme osoittavat kuitenkin myös, että voi olla, että julkista rahoitusta todella tarvitsevien pk-yritysten löytämiseksi ei ehkä ole panostettu riittävässä määrin. Tutkimuksemme tulokset tukevat ajatusta, että julkisen rahoituksen tulisi olla valikoivaa eli kohdistua vain niille yrityksille, jotka sitä todella tarvitsevat.

ASIASANAT: yritysrahoitus, julkinen rahoitus, markkinoiden epäonnistuminen, pk-yritykset

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1 Introduction

Not unlike elsewhere, the government in Finland has recently been keen to provide funding to Finnish firms, especially to small and medium-sized enterprises (SMEs).¹ In this paper, we focus on the following set of questions: Which government institutions provide funding to SMEs in Finland? What are they set to do? What is the relative importance of the different government institutions providing SME funding? How has the total amount of government funding awarded to SMEs developed in the recent past? What kinds of SMEs apply for and receive government funding? Are there systematic differences between SMEs that apply for and receive the different types of government funding?

A natural starting point for considering these questions is the *National Industrial Strategy for Finland* that was published in 1993 by the Ministry of Trade and Industry (MTI) amidst the economic and banking crisis that Finland experienced in the early 1990s.² The report concluded (p. 138) that

“Financing is one of the most difficult problems of small and medium-sized enterprises”

and emphasized (p. 143) that

“The shoring up of the banking system and development of capital markets would promote industrial growth”.

Figure 1 displays survey data on the percentage of Finnish SMEs reporting that the availability of capital is the most significant obstacle to developing the firm. The data suggest that the concerns put forward in the MTI report were not unfounded, as the availability of capital was the greatest concern to many SMEs in 1992. What the figure also shows is that things have changed dramatically since then. Today, only about 5 percent of SMEs regard the availability of capital as the most significant obstacle to developing the firm.

[Insert Figure 1 here]

¹ Following the recommendation by the European Commission 96/280/EU, an SME is in this study defined, whenever possible, as a firm that employs less than 250 people and that either has an annual turnover of at most 40 million euros or a balance sheet total of at most 27 million euros, and less than 25 percent of the shares are owned by large companies.

² An SME council report of the MTI, written in 1990, had already emphasized the importance of developing the Finnish venture capital industry that had begun to emerge in the 1980s but that almost disappeared because of the economic distress of the early 1990s. See Seppä (2000, p. 214) for further details.

A similar portrait of the current situation of the Finnish capital markets as that conveyed by Figure 1 emerges from the survey data reported in the *IMD World Competitiveness Yearbook 2002*: among the 49 countries researched, Finland ranks first in the question of how easily credit flows from banks to businesses; second in the question of how easily venture capital is available for business development; and finally, fourth in the question of how adequately the stock market provides financing to companies.³ *Seed Capital in the Nordic Countries: Best Practice*, a report of the Nordic Industrial Fund, argues that Finland has the best functioning seed capital market in the Nordic region. Finally, the *Global Entrepreneurship Monitor* -report from 2001 mostly echoes these results: among the 29 countries researched, Finland ranks fourth in the analysis of how easily entrepreneurs can access debt and equity.

Faced with this evidence, it is difficult to disagree with the view that the availability of external finance to Finnish firms has on the whole improved. Provided that the investment opportunities of Finnish firms have not dramatically decreased, there are three mutually non-exclusive explanations for the drastic reduction in the perceptions of how tight the market for capital is for a representative firm: either good profitability of firms has reduced the overall demand for external finance⁴, the functioning of the private capital market has improved significantly or government funding has successfully complemented the private market.

In this paper, we focus on the last of these explanations by studying the government funding of SMEs in Finland. How government funding gets allocated across SMEs is a question that has earlier been addressed only to a limited extent, if at all.⁵ The question is however topical and of first rate importance, not least because recent evidence suggests that certain types of SMEs may still face problems in raising external finance (despite that the overall availability of external finance to firms has improved). The most recent survey (from 2002) by the Federation of Finnish Enterprises and Finn-

³ In addition, Finland ranks first in the question of how well rights and responsibilities of shareholders are defined. Because investor protection has been found to be an important determinant of the availability of external finance to firms, this could be regarded as an indication of the availability of finance to firms in the long-run.

⁴ There is some evidence supporting this view. For example, according to the survey data reported in the *IMD World Competitiveness Yearbook 2002*, Finland ranks first in the question of how sufficient cash flow is generally to allow companies to self-finance.

⁵ In general, Finland's public financing programs have been regarded as competitive and successful (see, for example, Muotio (1998), MTI (2000), and Prihti et al. (2000), the studies summarized in Asplund (2000), and Rouvinen (2002)). However, relatively few studies have taken a 'holistic' look at the allocation of SME finance. Therefore, relatively little is known about the characteristics of SMEs that apply for and receive government funding from various government organizations

vera Ltd for example indicates that the availability of external financing *is* a problem for as many as every second *growth-oriented* SME. Further, the *Global Entrepreneurship Monitor* -report from 2001 shows that among the 29 countries researched, Finland ranks (interestingly) *only* sixteenth in the analysis of how smoothly the markets for venture capital, angel finance and initial public offerings operate.

We concentrate on the main institutions that currently provide government funding to Finnish SMEs. They are the State-owned specialized financing company Finnvera, the Finnish National Fund for Research and Development (Sitra), the National Technology Agency (Tekes) and the government venture capital firm Finnish Industry Investment (FII). Financing to SMEs also flows from the budgets of various ministries through regional Employment and Economic Development Centers (TE-Centers) and from various regional governmental and semi-governmental venture capital firms. On the whole, these institutions provide SMEs with financing via a variety of tools, including gratuitous (i.e. non-repayable) funding, such as direct subsidies, grants, aid, and guarantees, and non-gratuitous funding (i.e. funding that is repayable or provided in exchange for, e.g., an ownership stake in the firm) such as loans, capital loans, and direct equity investments.⁶

The rest of the study is organized as follows. In section 2 we review the main economic rationales for providing government funding to SMEs. In section 3, we describe the sources of government funding to SMEs in Finland. Section 4 presents an empirical analysis of the characteristics of SMEs applying for and receiving government funding. Section 5 concludes.

2 Theoretical Considerations

Economic analysis suggests two main rationales for governments to subsidize or to directly provide funding to SMEs, especially to technology intensive SMEs (see e.g. Lerner, 1999). First, public finance theory posits that if SMEs are a unique source of

⁶ In addition to SME financing, the institutions offer various support activities that include services and consulting, training, networking programs, and research. TE-Centers offer a variety of consulting and advisory services, as well as training programs. Tekes promotes networking in R&D through its Technology Programs, and Sitra supports networking in both its innovative programs as well as in its equity funding. Furthermore, Sitra plays an important role in training and in conducting societal research, and Tekes finances both basic and applied research at universities, research institutions, and companies. Other governmental and semi-governmental organizations also provide non-financial support to SMEs. For example Finpro has a role in promoting SME internationalization by offering marketing services and market information. In this paper we focus on funding and abstract almost entirely from these non-financial support programs.

new ideas and growth that generate beneficial externalities to other industries and firms, supporting them is appropriate. For example, because the social return from SMEs' R&D expenditures may exceed the private returns due to 'knowledge' spillovers (Griliches 1992), firms will tend to underinvest in R&D from the social point of view. Second, capital market imperfections, such as asymmetric information between firms and financiers, may result in persistent "funding caps" that constrain the birth of new enterprises, investments in innovative activity and the growth of SMEs (see also Cressy 2002). If that is the case and if government organizations are able to successfully identify firms that have unduly been excluded from receiving external finance in the marketplace, government funding might boost firm creation, innovation and growth, because it then rectifies capital market failures.⁷

Doubt has been cast even on these two rationales. Holtz-Eakin (2000) argues that evidence does not support the view that SMEs provide a disproportionate share of new ideas in the economy or that SMEs are producing too little innovative activity because they cannot capture the social return from it. Moreover, he emphasizes that even though a growing body of literature suggests that imperfections in capital markets, such as asymmetric information, may impede entrepreneurship and innovation, the literature does not show that "too few businesses are created each year, or that the 'wrong' firms get financed" (p. 286). De Meza (2002) moreover argues that subsidizing credit may under asymmetric information decrease efficiency, because the effect will be to draw in more low-quality types, resulting in too much unsound enterprise. And even if capital market imperfections were an important obstacle to entrepreneurship and innovative activity, the problem would still be, as emphasized by Holtz-Eakin, that "the government faces exactly the same difficulty [as the financial sector] and unless it somehow has an ability greater than the financial sector to discern the probability of business success, there is little that it can do to more efficiently allocate credit [capital]."⁸

⁷ In addition, if the government institutions were better than private sector financiers in identifying SMEs that are of high quality, they might also be able to encourage private sector financiers to invest in some of the SMEs that would otherwise remain unfunded in the marketplace (certification hypothesis). See Lerner (1999) for further discussion.

⁸ Holtz-Eakin also considers whether insufficient risk-taking and market inefficiency would constitute a rationale for treating SMEs preferentially. He concludes that they do not and that on the basis of economic analysis "it is surprisingly difficult to construct a case in favor of systematically favoring small businesses." (p. 283). ‘

The two main rationales for governments to provide SME funding and the doubt cast by Holtz-Eakin suggest that government funding should, if it is to be provided at all, be allocated across SMEs *selectively*. First, not all firms (should) choose to apply for it. Second, if government organizations aim at financing i) firms that generate beneficial externalities to society and other industries and ii) firms that suffer from capital market imperfections, firms that chose to apply need to be screened by the institutions providing government funding to find out those truly “eligible for it”.

Taken together, these considerations call to mind two things:

- First, market failures, i.e., the inability of SMEs to appropriate the beneficial externalities that they generate and the imperfections in the market for SME finance, are not a sufficient argument for a government to provide SME funding. To rectify the market failures, it is required that they can be identified and, particularly, that the institutions providing government funding can solve the fundamental screening problem of being able to determine those truly eligible for government funding.⁹ Otherwise, there is a non-negligible risk of government failure, i.e., that private activity is crowded out and that public funds are used inefficiently. Solving the fundamental screening problem is costly but amounts to nothing less than avoiding undesirable and counterproductive transferring of income (capital) between different sectors of the economy and raising capital via (distorting) taxation in vain.¹⁰
- Second, because the institutions providing government funding should according to the economic rationales be set to rectify market failures, they should (almost by definition) pursue the kinds of activities that are not privately profitable. What means is that *these* activities *cannot* in economic terms be profitable in the long-term. In fact, if they were, it would constitute evidence that the institutions are not solving the fundamental screening problem and taking sufficient risks, and that they practice business activity that competes with the private sector.

In what follows, we take a look at the government financing of Finnish SMEs and contrast it with the two main economic rationales for governments to provide funding to SMEs. We first examine whether and how the rationales and the fundamental screening

⁹ This means that there is a huge amount of information that the institutions providing government funding should process to overcome the same information asymmetries that the private sector financiers cannot and to identify SMEs that are likely to generate positive externalities.

¹⁰ de Meza’s (2002) conclusions further qualify this view. He emphasizes that there is a real possibility that lending needs to be curtailed, rather than expanded, to increase efficiency.

problem are taken into account in the rhetoric of the Finnish legislation governing the government institutions that support the Finnish corporate sector. Thereafter, we analyze recently collected data to explore the characteristics of SMEs partly financed by Finnish taxpayers' money.

3 Institutional Description

The Finnish legislation contains two Acts on the use of government funds in granting government aid and business subsidies in general.¹¹ These provide information on the general aims and conditions of government support. The Act on government aid 688/2001 applies to the use of government funds in government aid. It refers to the granting of subsidies, loans and other financing, interest subsidies, guarantees, and other similar benefits. Section 7 of the Act describes the general conditions on the granting of government aid:

“1) the purpose for which the aid is granted is socially acceptable; 2) the granting of government aid is justifiable based on the aims set for the use of the aid; 3) the granting of government aid must be considered necessary, taking into account any other public support received by the applicant, as well as the quality and scale of the project or operations targeted; as well as 4) the granting of government aid is not estimated to cause more than minor distortions on competition and the market, in a state belonging to the European economic area¹². ” (Authors' translation)

The Act on the general conditions on business subsidies 786/1997 applies to the granting of business aid directly or indirectly from government funds. Business subsidies refer to government aid and interest subsidies as well as loans, guarantees, or other financing, which involve a subsidy to the recipient.¹³

Section 3 describes the general objectives of a business support program:

“A business support program must promote the growth potential of the economy as well as increase the efficiency of business activity. A business support program must be targeted primarily to such purposes, which remove deficiencies in the market.” (Authors' translation)

“A business support program must be composed in such a way that the distortion on competition is minimized.” (Authors' translation)

¹¹ The source of all the quotes on the legislation is the database at www.finlex.fi. Translations are authors' own.

¹² Article 87 of the EC Treaty, 87(1): “1. Save as otherwise provided in this Treaty, any aid granted by a Member State or through State resources in any form whatsoever which distorts or threatens to distort competition by favouring certain undertakings or the production of certain goods shall, insofar as it affects trade between Member States, be incompatible with the common market.”

¹³ Section 2 also defines a business support program: “A business support program refers to a system, which is based on legislation or official decision, where the target, form and amount of the business subsidy is defined, and by virtue of which individual business subsidy decisions are made.” (Authors' translation)

“A business support program must be directed primarily at research, product development, education, internationalization or other intangible business development or improving the competitiveness of SMEs in the long term. For financing typical large company investments and working capital, business subsidies can be granted only on special grounds.” (Authors’ translation)

Section 5 describes the general conditions on business subsidies:

“Business subsidies can only be granted for such business activity, which is estimated to have the requisites for continuous profitable activity. The giver of the subsidy, when making the business subsidy decision, must establish the amount of public support as well as the total financing, profitability and effects on competition of the project in question.” (Authors’ translation)

In Finland, the government has empowered the MTI to create and implement policies that provide an environment conducive to the establishment of new businesses and their growth, where an important aspect is the development of corporate financing. According to the MTI,

“the objective is to improve the financing environment by measures corrective of operative deficiencies of the market and by actions promoting market operations”¹⁴

Of the currently active government institutions providing SME funding, the MTI administers Finnvera, Tekes, TE-Centers, and FII. These institutions serve as the public special financing infrastructure in the Finnish economy. In addition to the institutions administered by the MTI, Sitra and various regional governmental and semi-governmental venture capital firms provide funding to Finnish firms.

3.1 Historical background

The currently active institutions providing SME finance were established during two waves of government activity. The first wave began already in the 1960s, when the Finnish capital markets were heavily regulated. Financing of firms, especially SMEs, and innovative activity was then a cause of concern especially to a couple of influential individuals at the Bank of Finland (see Rosenlew 1985 and Seppä 2000).¹⁵ To address the concern, the Finnish government together with the Bank of Finland established a semi-governmental venture capital firm, Sponsor, and Sitra, in 1967. Other government organizations were also established during the era of regulated capital markets. In 1971, Kehitysaluerahasto Oy (the Fund for Developing Regions, known then as Kera and today as Finnvera) was founded to subsidize businesses and provide loans especially to

¹⁴ Source: Ministry of Trade and Industry web site www.ktm.fi

¹⁵ Seppä (2000) carefully cites Rosenlew and also provides other references on contemporary accounts of Finnish firm finance.

firms residing in the less developed rural areas. In the early 1980s, no less than seven regionally focused government development companies, (kind of venture capital firms), were established by the municipalities and Kera. Establishing Tekes in 1983 to advance the financing of R&D and innovative activity eventually completed the first wave.

Much has happened after the first wave ended. Following the financial liberalization and credit boom of the 1980s, Finland underwent in the early 1990s the most serious cyclical downswing in the industrialized countries since the Great Depression of the 1930s (see e.g. Kiander and Vartia 1996, and Honkapohja and Koskela 1999). Integral to the economic distress was a major banking crisis that led to heavy government intervention and complete reorganization of the Finnish banking sector.¹⁶ Because banks had for decades been the major source of external finance to Finnish SMEs, it is no surprise that in the Finnish industrial policy, the SME sector and its financing received special attention in the early 1990s.

The second wave of government activity can be said to have begun when a new government venture capital firm, SFK Finance Oy, was established in 1990 by Kera to manage a new government venture capital fund, Start Fund of Kera. At about the same time, in 1991, Sitra, which had been active in developing the venture capital culture already at the end of the 1980s, was separated from the control of the Bank of Finland, transferred to under the supervision of the Parliament, and activated as a venture capital investor.

Inspired, at least in part, by the suggestions of the *National Industrial Strategy for Finland* and by the example of the European Investment Fund as well as Norwegian and Swedish government initiatives, the government fund of funds, FII, was established in 1995 to promote the development of venture capital in Finland. In 1997, TE-Centers were established. The second wave was completed in 1999 when the State-owned specialized financing company Finnvera was created through the merger of Kera and the Finnish Guarantee Board.

¹⁶ Since the end of the first wave, the Finnish financial system has disengaged from relationship-based debt finance towards increasing influence of stock markets. During the same period, also creditor protection has been weakened while shareholder protection has been strengthened (Hyytinen, Kuosa and Takalo 2002).

3.2 Government Institutions Funding SMEs

Finnvera plc

Finnvera plc is a State-owned specialized financing company administered by the MTI. It also is Finland's official Export Credit Agency and acts as an intermediary between the European Union's financing programs and Finnish SMEs.

As we mentioned in the previous section, Finnvera obtained its present form in the beginning of 1999. Its activities are regulated by a number of Acts. The Act on the State-Owned Specialized Financing Company 443/1998 describes the official purpose of Finnvera. According to section 1 of the Act, Finnvera's objective is:

“to promote and develop particularly SME operations as well as firm internationalization and export operations, by offering financing services. In its activities, the institution must also promote government's regional policy measures. The operations must be directed at correcting any deficiencies that exist in the provision of financial services.”¹⁷ (Authors' translation)

Section 2 of the Act defines the tasks set for Finnvera:

“The company practices financing activities by providing and managing credit, securities and guarantees as well as other commitments. The company also conducts research related to business finance, and provides business development services and advice.” (Authors' translation)

The Act on Credits and Guarantees Provided by the State-Owned Specialized Financing Company 445/1998 sets that the finance must be directed primarily at SMEs. It also sets that credit can be granted without sufficient collateral or with no collateral, and that for special loans the government pays interest subsidies to Finnvera that it channels to the firms. The Act on State's Export Credit Guarantees 422/2001 sets that the objective of export guarantee activities is to strengthen the economic development in Finland by promoting exports and firm internationalization. Export credit guarantees are granted to cover for the risk of losses from exports and investments abroad.

Finnvera's mission is directly taken from the objectives set by law. How Finnvera perceives its position in the market is best described by quoting the Managing Director:

“...Finnvera has gained an established position as a co-operation partner sharing the financial risks of Finnish enterprises, regardless of whether these enterprises have just started their business, are in the phase of growth and internationalization, or already operate in the export market.”¹⁸

¹⁷ The following quote from Finnvera's Annual report hints at how Finnvera is monitored: “Deficiencies on the financial market are charted annually by means of financial studies and analyses. By monitoring [Finnvera], it is determined how well [Finnvera's] operations can compensate for existing financial market deficiencies.” (Finnvera's Annual report 2001, p.26)

¹⁸ Finnvera's Annual Report 2001, p.4

Section 4 of the Act on the State-Owned Specialized Financing Company 443/1998 sets the economic principles governing Finnvera's operations:

“Finnvera must aim at self-sufficiency, i.e. that the expenses from its operations can be covered with income from its operations in the long term. To cover such activities that the government decides to support separately, the required appropriations are included in the state budget.” (Authors' translation)

However,

“As a public limited company that operates in an inherently risky investment environment, the State has established certain provisions that allow the company to take risk while remaining self-sufficient.”¹⁹ (MTI 2000)

Finnvera's services are offered both through its own national network of 16 regional offices and through the cooperation network of other public organizations providing services for enterprises. The following two quotes, taken from Finnvera's web site, refer to the criteria Finnvera applies when granting finance:

“Finnvera's objective is to provide risk financing to enterprises with a sound business idea and preconditions for profitability when a company has insufficient collateral to raise funds for investments and development projects.”

“The financing decision is preceded by a company analysis conducted by Finnvera's corporate analyst, that analyses the company's business operations, ownership, management, and finances. The company's potential for success is evaluated based on these.” (Author's translation)

Finnvera's business financing includes loans, guarantees and export credit guarantees. Finnvera offers entrepreneur loans for starting up a business, development loans for business development projects, investment and working capital loans and guarantees, a variety of internationalization loans and guarantees, and environmental loans and guarantees. According to Finnvera, it is able to offer interest-subsidized special loans and accept collateral for loans considered insufficient by the private sector. Special subsidized loans are also available for firms in the European Union's objective regions. Finnvera also engages in risk sharing with the private sector. It has, for example, established cooperation relations with banks and insurance institutions in which the role of Finnvera is to share risk by guaranteeing loans.

Figure 2 shows the total amount of domestic financing granted by Finnvera (and its predecessors Kera and Finnish Guarantee Board) over the years 1997-2001.²⁰ The

¹⁹ “Finnvera is exempt from the Act on Credit Institutions; as well it is beyond the Banking Supervisory Authorities jurisdiction... The Republic of Finland provides annual assistance to it in three additional ways: interest rate subsidy, credit and guarantee loss subsidy, and operating subsidy.” (MTI 2000, p.31)

²⁰ All the time-series presented in this paper have been deflated using the consumer price index so that the time-series data are measured at 2001 price level.

total amount granted, consisting of loans and guarantees, has increased by about 20% in real terms over the five years. This is mostly the result of a large increase of 48% from the year 1999 to 2000 in the amount of guarantees granted. The amount of loans granted has increased by only 5% over the whole five-year period. As a result, the share of guarantees in Finnvera's financing has increased from less than half to more than half. While not shown in the figure, the share of Finnvera's total domestic financing that is directed to SMEs is slightly below 90% and has increased a little over the years.²¹

[Insert Figure 2]

The National Technology Agency (Tekes)

Tekes is the main financing organization for R&D in Finland. The Act on the National Technology Agency 429/1993, section 2, sets the objective for Tekes:

“to promote the societal welfare and stable development by improving directly or indirectly the technological evolution and competence of industry to enhance its ability to develop internationally competitive products, processes and services.” (Authors' translation)

Section 3 specifies the tasks set for Tekes:

“The National Technology Agency plans, finances, and administers R&D projects that promote the development and utilization of technology. It funds and consults in ventures aimed at the development of products, processes and services as well as promotes widespread utilization of international technological know-how and cooperation, and technology transfer. In addition, Tekes takes part in the planning of Finnish technology and innovation policies along the lines given by the MTI.” (Authors' translation)

The decree on the National Technology Agency 467/1993, section 1, defines the activities stated in the Act in more detail, with additional references to:

“strengthening competitive, technology-based business activity particularly in the SME sector.” (Authors' translation)

“developing the technological cooperation between firms and research institutes to facilitate effective utilization of research results in business.” (Authors' translation)

The decision of the Council of State 461/1998 sets the general rules governing the granting of finance for technological research and development. Tekes can grant subsidies and loans (including capital loans) to companies and other associations for the pur-

²¹ Over the years 1999-2001, Finnvera's financing granted to micro firms (defined as firms employing less than 10 people) has increased (in 2001 prices) from just over €150 million to around €180 million, and that to other SMEs has gone up from €320 to €450 million. Finnvera's foreign risk-taking commitments are mostly directed to major companies. Well below ten per cent of guarantees covering foreign risks are granted to SMEs, yet out of Finnvera's 240 foreign risk-taking clients, one third are SMEs.

pose of technological research and development. The decision sets the amounts of subsidies and loans that can be granted. Where the finance is directed to SMEs, EU projects, cross-national R&D projects or cooperation of the public and private sector, the amounts can be raised (by 10-25%). Where finance is granted to large companies, some degree of networking or other cooperation is required. The loan interest rates charged by Tekes are below the market rate and the maturity of its loans can be up to ten years.²² The repayment of the loan can be terminated if the R&D project fails or does not lead to profitable business.

Tekes' mission statement, as found on its web site, states that:

“Tekes' primary objective is to promote the competitiveness of Finnish industry and the service sector by technological means. Activities aim to diversify production structures, increase production and exports, and create a foundation for employment and social well-being.”

Furthermore, Tekes has translated its tasks into strategic goals:

“ [1] to strengthen the national knowledge base in the sectors of society and the economy most important in terms of Finland's future. [2] to increase the number of technology-based companies and ensure their growth. [3] to increase the number of companies that engage in R&D, and to ensure that R&D projects implemented are more challenging and longer-term. [4] to produce commercially viable results from R&D and accelerate their commercial application. [5] to ensure that technology policy supports regional development.”

Tekes financing is decided and determined annually and comes directly from the state budget. It does not have a requirement for self-sufficiency.

Tekes offers its services through its own personnel at the regional TE-Center offices, through its headquarters in Helsinki, and also through four offices abroad. According to Tekes, its funding is targeted at projects, which are expected to produce new know-how, and bear high technological and commercial risks. Some of the qualification criteria for receiving finance from Tekes are presented on Tekes' web site:

“The following factors are evaluated: the company's competitiveness and growth, the competitive advantages of the technology or technique, the company's re-sources, and how Tekes financing will influence the project.”

“Tekes takes a positive view towards projects that involve networking with other companies, joint ventures, the use of local SME subcontractors in the case of larger companies, participation in national technology programs, contracting of services from Finnish research institutes and universities and promotion of international co-operation.”

“The results of the work will have to improve the competitiveness and expertise in Finnish industry.”

²² The interest rate is three percentage points below the Central Bank rate, yet at least 1%. The interest rate on capital loans is two percentage points higher than that for loans. The first five years can be free of repayments.

Tekes uses all types of financing that the decision of the Council of State allows it to use: industrial R&D grants and loans, capital loans for R&D, and research funding.²³ In addition to funding various kinds of R&D projects using these instruments, Tekes organizes technology programs in selected strategic areas. The aim of these programs is to promote the competitiveness of industry and enhance technological cooperation and networking.

Figure 3 presents the amounts of Tekes' financing over the past five years, divided into industrial R&D loans, capital loans, grants to companies, and research funding for universities and research institutes. We see that the bulk of Tekes' financing is in the form of R&D grants and research funding. On the whole, Tekes' financing has increased by 8% in real terms over the years 1997-2001. From 1997 to 1999, there was a real increase of 18% in financing but this has been offset by a decrease of 8% from 1999 to 2001. One significant trend is that capital loans have gained importance in Tekes' financing; over the five-year period the amount of capital loans granted has more than doubled. The share of Tekes' total financing that is directed to SMEs has increased from a little above 40% to over 50% during the five years.²⁴

[Insert Figure 3]

The Finnish National Fund for Research and Development (Sitra)

Sitra is an independent public foundation under the supervision of the Finnish Parliament. The Fund was set up in conjunction with the Bank of Finland in 1967, and transferred to the Finnish Parliament in 1991. The Act on the Finnish National Fund for Research and Development 717/1990, section 2, sets the objectives for Sitra:

“to promote stable and balanced development, business activity and its quality, as well as international competitiveness and cooperation of Finland by undertaking such ventures, which have the effect of more efficient use of resources or improving the standard of research and education, or which explore future development opportunities.” (Authors' translation)

Section 3 defines the activities that Sitra can undertake to achieve its aims:

“The Fund can: 1) conduct or outsource research, 2) grant loans and other financing (the repayment of which can be made conditional), 3) grant subsidies, 4) grant securities and

²³ In companies' product development projects Tekes' typical share of total project finance for SMEs is 35% in R&D grants, 45% in capital loans, and 70% in R&D loans. These figures are higher for SMEs than for large companies. For companies' research projects the respective figures are 50%, 60%, and 70%.

²⁴ From 1997 to 2001 Tekes' financing granted to small firms has by 42% in real terms, and that to medium-sized firms has gone up by 32% in real terms.

guarantees, as well as 5) participate in cooperation projects and own shares in companies.” (Authors’ translation)

Sections 4-7 of the Act set the economic principles for Sitra’s activities. Section 5 states that:

“The operations of the Fund are financed from its endowment capital and returns from its financing activities.” (Authors’ translation)

Section 6 adds that:

“The government can take appropriations in its budget to increase the endowment capital of the Fund. Appropriations can also be taken to finance the operations described in section 3.” (Authors’ translation)

Sitra’s own interpretation of its aims and tasks, found on its web site and annual reports, coincides with the rhetoric in the legislation but is rather general in nature:

“The Fund aims to promote Finland’s economic prosperity by encouraging research, backing innovative projects, organizing training programs and providing venture capital.”

“Sitra – aims to further economic prosperity in Finland by developing new and successful business operations, by financing the commercial exploitation of expertise, [and] by promoting international competitiveness and co-operation.”

With regard to its business financing activities:

“The principal purpose of Sitra’s corporate funding is to create and develop competitive and profitable business in Finland by offering entrepreneurs and companies financing and services to help them develop.” (Annual Report 2001, p.22)

The business financing activities are divided into four areas: technology, life sciences, regional operations and early stage SMEs. According to Sitra, its venture capital operations focus on start-up companies, companies in the phase of product development, and especially on “innovative technology companies”. In Sitra’s Annual Report 2001 Sitra’s technology team specifically states that it “concentrates on those areas where private investors are not yet prepared to provide funding alone” (p. 12).

Sitra offers its services through its office in Helsinki. The following quotes from Sitra’s web site provide us with some information on how Sitra assesses the projects to be financed:

“Sitra invests in companies whose activities are based on technological innovations or other special expertise and which can also be expected to become important business actors. Very often a company’s growth depends on its possibility of gain-ing access to the international arena. The object of Sitra’s investment may also be a project whose aim is to found a company that will exploit research carried out by a research institute or university.”

“Sitra evaluates the following factors before deciding to provide capital: the market potential of the company’s products, the uniqueness of the technology and whether it can be

protected, the company's prospects for growth, the weakness and strengths of the company's management, and the company's competitiveness."²⁵

Though Sitra could use a variety of financing instruments, it finances firms mainly using equity and equity-linked instruments.²⁶ Using these instruments, Sitra collaborates with both public and private investors.²⁷ In addition to its direct investments, Sitra makes investments in international funds and management companies, regional funds and management companies, and other Finnish funds and management companies.²⁸

Figure 4 presents Sitra's financing figures for the years 1997-2001. Financing is divided into research, innovative projects and training (RIT), direct investments, and domestic and international fund investments. The amount of direct investments made annually has increased by 142% in real terms over the five years. Fund investments have varied from year to year, year 2000 being a peak year, when large investments into international funds were made. In 2000, also portfolio investments nearly doubled, and thus the total amount of financing granted more than doubled from 1999 to 2000. Overall, more than half of the investments go to portfolio companies.²⁹

[Insert Figure 4]

Finnish Industry Investment (FII)

FII is a State-owned equity investment company, administered by the MTI. The Act on Finnish Industry Investment Ltd. 1352/1999 sets the objective for FII:

“To improve the conditions particularly for SME operations by investing equity into venture capital funds. FII can also make equity investments directly into target companies particularly in business ventures requiring long-term risk taking.” (Authors' translation)

²⁵ “Competitiveness is evaluated using the following yardsticks: the involvement of the entrepreneurs, the credibility of the concept, the technical and commercial competitiveness of the product/s, market and transfer prospects, strength of know-how and technology, sufficient expertise in entrepreneurship”

²⁶ Sitra's holding in the start-up stage is usually 15-40 per cent. At the same time, Sitra's representative participates as a board member in the management and the running of the company, and helps the company to establish international contacts. In general the size of Sitra's involvement varies between €0.2-2.0 million. Exit from portfolio investments takes place normally within 3-6 years.

²⁷ “The most likely partners are from the public sector, especially Tekes, from which nearly all Sitra's companies have received funding” (Annual report 2001, p. 22) and “about a half of Sitra's portfolio consists of syndications” (Annual report 2001, p. 12)

²⁸ According to Sitra, it also aims at creating SME networks for promising fields of business. It also tries to fill the (financing) ‘gap’ between a business idea and venture capital. To this end, it together with Tekes set up a PreSeed fund in 2001 that provides financing in two phases. The first phase, LIKSA, funds the development of a business plan from a profitable idea. The second phase, INTRO, introduces companies to prospective investors. Finally, Sitra also promotes technology transfer in collaboration with technology-transfer companies.

²⁹ In 2001, seed and start-up companies made up almost half of Sitra's investment portfolio by value of investment, and early-growth companies close to one fourth.

The Decision of the Council of State (2000) sets general guidelines for FII's investment activities. Section 1 specifies that

“Investments are directed to targets, where the market does not channel sufficient funds” (Authors' translation)

Furthermore, it sets the focus of FII's activities:

“The first area of focus is the improvement of equity funding to seed companies. Especially important in this regard is the setting up, development, and financing of funds investing in seed and start-up stage firms, the development and financing of a regional network of funds, as well as the channeling of EU finance.” (Authors' translation)

“Another area of focus is equity investments into large business ventures requiring long-term risk-taking” (Authors' translation)

“In addition to the industry, the investment activities also target the service sector, especially knowledge intensive service enterprises.” (Authors' translation)

Section 2 of the Decision defines the objectives of the investment activity in more detail:

“[1] Enhance equity investments into seed and start-up stage innovative companies by encouraging the setting up of funds targeting those; [2] promote the channeling of private equity into seed/start-up funds; [3] speed up the commercialization and internationalization of the results of R&D; [4] promote structural change in the economy by direct investments in line with the aims of economic policies; [5] promote the functioning of the venture capital market aiming at a more developed market; [6] improve firms' possibilities for growth, internationalization, and public stock offerings by utilizing the possibilities of international fund cooperation; [7] to promote the channeling of equity-based EU funding to Finland.” (Authors' translation)

FII has translated the tasks set in law into four objectives, which are in line with the legislation.³⁰

The funding of FII is based on proceeds accrued from the privatization of state-owned companies but the section 2 of the Act 1352/1999 on FII sets that:

“The company's activities should be profitable in economic terms.” (Authors' translation)

It also states that:

“In individual investment decisions, the company can accept lower expected returns and higher risks than normally” (Authors' translation)

The Decision of the Council of State further specifies that:

“Due to the economic policy tasks set for the company, a lower target on returns is accepted than in the venture capital industry in general.” (Authors' translation)

³⁰ These are, as quoted on FII's web site, “to encourage more efficient functioning of the venture capital investment market by investing actively in new venture capital and private equity funds in Finland, to promote product realization and commercialization of new innovations by investing in seed and growth-stage enterprises together with private investors, to promote regional venture capital investment, to use direct investments to enable major investments in corporate development, corporate restructuring and the launch of new industrial projects.”

And that:

“to balance [FII’s] investment portfolio and to secure the profitability objective, [FII] can make investments in the market into funds that target companies in the later development phases.” (Authors’ translation)

FII invests in three types of funds targeted at financing companies in different growth phases. Private equity funds target later growth stage companies, including corporate restructuring. Venture capital fund investments target early and initial growth stage companies. Regional funds target companies in various growth stages in the fund's regions. FII also engages in direct investment together with other investors and financial institutions. According to FII, direct investments are channelled into “restructuring efforts” or “selected growth” companies.

FII offers its services through its office in Helsinki. Concerning the screening process for direct investments, the Decision of the Council of State asserts that “the starting point in direct investments is the identification of market deficiencies and cooperation with private equity.” However, there is some indication that FII also pays attention to other objectives, such as diversifying Finnish firms’ production structures, keeping firms’ know-how and production facilities in Finland, and increasing the rate of employment (see for example FII’s Annual Report 2001, p. 11). Given the starting point and these objectives, the following statement from FII’s Annual Report 2001 has in many ways a contrasting indication, “[direct] investments are expected to yield earnings on market terms” (p. 11).

Figure 5 presents FII’s investment figures for the past five years, divided into fund investments and direct investments. Clearly most of the investments are made into funds, as investments into target companies typically make up less than one tenth of the total. The total annual investments made increased by 70% in real terms from 1997 to 1999 but have fallen since then by about 30%.

[Insert Figure 5]

Employment and Economic Development Centers (TE-Centers)

TE-Centers (Employment and Economic Development Centers) are public offices under ministerial supervision³¹, providing various business related services and finance. The

³¹ More specifically, TE-Centres operate under the supervision of MTI, Ministry of Agriculture and Forestry, and Ministry of Labour. MTI is responsible for their general administration.

Act on the Employment and Economic Development Centers 23/1997 sets the tasks of the TE-Centers as to promote specified areas of business activity, labor issues, as well regional development by offering financial, training, development, and other services. The one of interest for this study is:

“to promote particularly SME operations and operating conditions as well as their technological development and internationalization.” (Authors’ translation)

There are a number of TE-Centers located regionally, and they are organized in departments. The decree 93/1997 assigns the task of promoting SMEs within the operating region of a Center to the business departments of the TE-Centers.

The business departments at the TE-Centers aim to serve the needs of SMEs by providing business development services and finance. As quoted on the TE-centres’ web site, their tasks related to SME development are as follows:

“[1] to support and advise small and medium-sized enterprises at the various stages of their life cycles, [2] to promote technological development in enterprises and assist in matters associated with export activities and internationalization, [3] to influence and participate in regional development in general”

TE-Centers offer services through their 15 regional centers. TE-Centers offer entrepreneurship grants for unemployed people to become self-employed. TE-Centers also partially finance enterprise investment and development projects. Grants are the dominant form of financing. The most important kinds of financing are regional investment aid, small business aid, development aid, aid for improving operational conditions for firms, internationalization aid, and energy subsidies. The grants can cover up to 50% of the costs of the project, and vary across the EU objective regions of Finland. On their web site, they provide information on the prerequisites for receiving financing. For investment projects:

“...the company is expected to have the requisites for continuous profitable operations. In addition, the expansion or renewal is estimated to have the effect of substantially increasing the number of jobs, or the value-added of the production or services.” (Authors’ translation)

For development projects:

“Development projects are expected to have significance and novelty value in view of the company’s operations. Correspondingly, internationalization projects are expected to have significance in view of internationalization... The granting of finance requires that the applicant has realistic requisites to complete the planned project and to benefit from its results.” (Authors’ translation)

Figure 6 presents the financing provided by the TE-Centers over the years 1997-2001. The financing is divided into investment subsidies, development subsidies, and subsidies for improving the operational conditions for firms. Total financing granted

annually has increased by about 8% in real terms from 1997 to 2001. Most of the financing, about two thirds, consists of investment subsidies, which are also responsible for the increase in total financing.

[Insert Figure 6]

Summary: How has the total amount of government funding awarded to SMEs developed in the recent past?

Figure 7 shows the total amount of direct and indirect financing granted to SMEs by the institutions over the years 1997-2001.³² What we can see from the figure is that the total amount of direct financing has increased quite dramatically, from €486 million to €575 million (in 2001 prices). This increase means that direct SME financing has according to our estimates grown in real terms by more than 18%. The increased financing by Finnvera accounts for about 32% of the total (real) increase, while Tekes accounts for 41% and Sitra for the remaining. The figure also shows that the volume of indirect financing has grown in real terms, too.

[Insert Figure 7]

To get a closer look at the recent developments in SME funding, Table 2 displays the annual real growth rates of direct SME funding, computed separately for each government institution from 1998 to 2001 (Panel A); the annual real growth rates of indirect SME funding (Panel B); the annual real growth rate of private venture capital investments (Panel C); and the percentage of SMEs reporting in a survey that they have encountered problems when raising external finance (Panel D). As a comparison across the panels shows, the various institutions providing SME funding have increased their financing simultaneously. In particular, government's direct funding to SMEs increased more rapidly during the two boom years of 1999 and 2000 than during 1998 or 2001. Based on these short time series, we cannot exclude the possibility that increases in government funding to SMEs have coincided with increases in the availability of external finance on the market.

³² Direct financing refers to subsidies, loans, capital loans, and direct equity investments. Indirect financing refers to fund investments by Sitra and FII, as well as to Finnvera's guarantees. We wish to emphasize that indirect financing, as we have defined it here, is not necessarily directed only to Finnish SMEs.

[Insert Table 2]

Finally, Figure 8 displays the relative shares of the total direct financing granted to SMEs by the various institutions. The figure shows that unsurprisingly, Finnvera is clearly the largest player by the volume of financing (about 50%), followed by Tekes (about 20%) and that the relative shares of the total financing granted to SMEs by the various institutions have been quite stable. Despite the fact that Sitra has increased its SME financing over 1997 and 2001 most dramatically, its relative share has increased only moderately, from 4% to about 7% in 2001. We can conclude that no dramatic shifts in the relative volumes of SME financing by the different institutions have taken place.³³

[Insert Figure 8]

3.3 Assessment

Overall, the “rhetoric” in the Finnish legislation governing the government institutions that support the Finnish corporate sector provides us with a general idea of what the institutions are set to do. The rhetoric for the various institutions shares quite a few common themes, such as promoting Finnish firms’ and particularly Finnish SMEs’ development, growth and internationalization, but varies in its emphasis. Moreover, what institutions themselves argue to be doing is unsurprisingly not inconsistent with the general idea of what they are set to do. The rhetoric is, however, general in nature, leaving a lot of room for interpretation and subjective judgment.

How does the rhetoric compare with the two main rationales that economic analysis put forward for governments to provide funding to the SME sector? In our view, the following stands out:

- First, the rhetoric does not explicitly emphasize that Finnish firms, especially SMEs, are to be supported *because* they underinvest in activities that generate positive externalities to other industries and firms. Of course, it is difficult to argue that such a view does *not* underlie the general objectives set for the institutions and the institutions’ own reporting, such as promoting firms’ inno-

³³ Figure A1 in the Appendix 1 shows the relative shares of indirect financing by FII, Sitra, and Finnvera.

vativeness, competitiveness and internationalization. The view is however not explicit.

- Second, the legislation does quite explicitly refer to the need to rectify capital market failures.³⁴ References to capital market failures are, however, made at a very general level, and no definition for a capital market failure is provided. Because this lack of detail leaves (too) much room for interpretation and subjective judgment, the danger is that also a minor functional deficiency may be interpreted to constitute a market failure.
- Third, the rhetoric in the legislation does not take into account that the existence of a market failure is not a sufficient argument to provide government funding. In particular, besides the rather general clauses in the Acts on government aid and subsidies 688/2001 and 786/1997, no *explicit* requirement is made that the institutions providing government funding *devote efforts* to solve the fundamental screening problem of determining those truly eligible for government funding. For example, no reference is made in the legislation (or in the institutions own reporting) to the identification or measurement of “social returns” or beneficial externalities that the projects financed by the government are supposed to generate. Lack of such requirements for selectivity is unfortunate, because firms may well seek government funding just to increase their profits (wrong kind of self-selection) and because SMEs may receive funding on the basis of their likely success, regardless of whether it is needed (wrong kind of screening).
- Fourth, the rhetoric in the legislation is a bit puzzling because at least for Finnvera, Sitra and FII, there is a requirement for self-sufficiency. The requirement for self-sufficiency is not consistent with the idea that the institutions are in the business of rectifying market failures. That means that they are set to perform activities that have not been successfully carried out by the private sector that primarily responds to profit motives. The institutions can, of course, be self-sufficient if they also practice business or investment activities other than those aiming at rectifying market failures. However, the rhetoric is not explicit that the requirement cannot typically be extended to the ac-

³⁴ This is especially clear in the case of Finnvera Ltd and FII. For the other institutions such an objective has not been set so explicitly, though Sitra seems to emphasize it in its own reports.

tivities that aim at rectifying market failures.³⁵ In fact, what is evident from the institutions' own criteria used for screening applicants, is that they are not far from the private sector requirements and refer to "potential for success" and "requisites for profitability".

Finally, because of the favorable overall financial development between 1997 and 2001, it is a bit puzzling that government funding to SMEs has according to our estimates grown in real terms more than 18% during the period. It is puzzling especially because

- the institutions providing government funding increased their financing most rapidly during the two boom years of 1999 and 2000.

It in fact seems that that government funding has varied in tandem with, or has lagged somewhat, increases in the availability of finance on the market place. An interpretation of these findings is that government officials react to correlated signals about the need for government funding so that they are likely to adjust their levels of funding simultaneously. Of course, no individual institution is to blame for this apparent 'lack of coordination'. The finding calls, however, for better coordination between the various institutions providing government funding.

4 Empirical Analysis

As discussed, the data on the SMEs' use of government funding reflect the equilibrium of two selection processes: When we observe that a firm receives government funding, it has i) decided to apply for it and ii) passed the screen of the government organization providing the funding. In this section, we take a look at the outcome of these two selection processes by studying the characteristics of the Finnish SMEs that have in the recent past applied for and received government funding.³⁶

³⁵ There are exceptions to this view. For example, a government institution might be pursuing activities that are strongly complementary to the activities that it is supposed to finance. In this case, scope economies might arise, rendering the activities that aim at rectifying market failures "profitable" in economic terms. This argument presupposes however strong specialization by the government institution and that it has a comparative advantage in financing the (complementary) activities.

³⁶ The empirical analysis that follows is based on new data originating from a recently conducted primary survey administrated by the Research Institute of the Finnish Economy (ETLA) and its subsidiary Etlatieto Ltd. The survey was conducted between December 2001 and January 2002. It resulted in a dataset that covers close to 1000 SMEs from all major sectors of the Finnish economy. Only farm (agricultural), financial, and real-estate sectors are fully excluded. The data cover only SMEs that are not proprietorships, partnerships, or subsidiaries. A detailed description of the survey and data is presented in Hyytinen ja Pajarinen (2002), available at www.etla.fi.

Because of data limitations, we focus in most of what follows on four main “types” of government funding. The first two are funding provided by Finnvera and funding provided by Tekes, which both at least in principle have quite clearly defined roles in the Finnish SME finance. They both provide gratuitous finance (i.e. funding that is not repayable, such as direct subsidies, grants, various forms of aid, and guarantees) as well as non-gratuitous finance (i.e. funding that is repayable in a sense, consisting of loans, capital loans and equity). The other two “types” of funding are government venture capital and other subsidies. Government venture capital consists of funding provided by Sitra, FII and the various governmental, semi-governmental and municipal venture capital firms and fund management companies operating regionally.³⁷ We call this funding government venture capital, because these institutions typically only grant non-gratuitous funding. Other subsidies consist of gratuitous government funding, provided for the most part through the TE-Centres.³⁸

4.1 Descriptive Analysis

Extent of government funding

Table 3 presents the proportion of SMEs that reported in the survey that they have received government funding during the last fiscal year, or thereafter (the first column), as well the proportion of SMEs that have received government funding prior to their last fiscal year (the second column). The table shows that as many as 17.1% (27.9%) of SMEs has recently (in the past) applied for and received at least one type of government funding. Combining the information in the two columns and eliminating double accounting yields the following finding:

³⁷ Our data would in principle allow us to study the financing provided by Sitra separately from other government venture capital. The total number of SMEs applying for and receiving funding from Sitra is however very small, both in the population of Finnish firms and in our sample. The numbers we could have presented for Sitra would have been based on “rare events” data. Because we cannot be sure that the firms financed by Sitra that are in our sample are representative of the firms Sitra actually finances, we only consider composite government venture capital.

³⁸ To find out the extent of gratuitous funding received by SMEs, entrepreneurs were in the survey asked in a series of questions (Questions 52-55) whether their company had received aid, grants or guarantees from 1) Finnvera, 2) Tekes, 3) Sitra or 4) some other governmental or municipal organization or other public institution during the last fiscal year or thereafter [or: prior to the last fiscal year]. To find out the extent of non-gratuitous funding received by SMEs, the series of questions was repeated in identical form except that “aid, grants, guarantees” was replaced with “loans, capital loans or equity investments”. Some of these questions had a multi-layer structure that was used to further investigate why an SME had not applied for government funding, etc.

- Every third (33.4%) SME has applied for and received at least one type of government funding.

Table 3 also shows that as expected, an SME is most likely to apply for and receive government funding from Finnvera (8.3%). Finnvera's funding is followed by the other subsidies provided mainly via TE Centres (5.0%) and Tekes' funding (4.9%). Overall, these patterns of government funding are similar to those portrayed by the aggregate data, lending credence to the quality of our data. Finally, the second column shows that a representative SME has also in the past been most likely to rely on Finnvera's funding (19.5%), followed by other subsidies (8.9%).

[Insert Table 3]

Government funding by firm characteristics

Table 4 presents the proportion of SMEs that have applied for and received government funding during the last financial year or thereafter, conditional on their characteristics.³⁹ On the basis of the rhetoric in the Finnish legislation governing the government institutions that support the Finnish corporate sector, we consider the following five categorizations of firm characteristics:

- **Basic characteristics:** In the age categorization, firms are divided into three groups according to their AGE_i (= the age of firm in years): "Infant firms" are those aged between 0-4, "Adolescent" are aged between 5-8, and "Old" aged 9 or above. Regarding the size of SMEs, "Small SMEs" are defined as those SMEs that have EMP_i (= the number of employees) less than 20 and less than one million euros in turnover. "Large SMEs" are SMEs exceeding either of the criteria. In the growth categorization, "High growth" refers to firms whose $GROWTH_i$ (= the average sales growth rate over the next three years, as projected by the entrepreneurs themselves) exceeds 10%, and the rest belong to the "Low growth" category.
- **Innovativeness:** In the R&D classification, "No R&D" refers to those firms for which $R \& D_i$ (= the ratio of R&D expenditures to sales) is zero, "Low

³⁹ The entries in the table can be interpreted as the conditional probability that an SME applies for and receives certain type of government funding, given its characteristics.

R&D” to firms for which it is positive but less than 5%, and “High R&D” to those for which it is more than 5%. Furthermore, SMEs are divided into “Yes”/”No” categories on the basis of $PATENT_i$ (= dummy set to 1 if firm has patents) and $INTANG_i$ (= dummy set to 1 if the entrepreneur evaluates that his/her firm owns other intangible assets than patents).

- **Internationalization:** In the export categorization, “No exports” refers to SMEs with $EXPORT_i$ (= the ratio of export to total sales) zero, “Low exports” to SMEs with $EXPORT_i$ up to 25% and “High exports” to SMEs for which it is above 25%. SMEs are also divided into “Yes”/”No” categories on the basis of $FOREOPER_i$ (= dummy set to 1 if firm has other activities abroad besides export), and $AUDIT_i$ (= dummy set to 1 if firm is audited by one of the internationally recognized ‘Big Five’ accounting firms)⁴⁰.
- **Profitability:** SMEs are divided into “Yes”/”No” categories on the basis of $PROFIT_i$ (= dummy set to 1 if firm’s return on assets was positive in the last fiscal year) and $PROFITCH_i$ (= dummy set to 1 if the entrepreneur answered in the survey that her firm’s current profitability is better than it has been over the last three years on average).
- **Other:** Here SMEs are classified into “Yes”/”No” categories on the basis of $LOANDEN_i$ (= dummy set to 1 if firm’s loan applications have been turned down in the marketplace because of lack of collateral and/or guarantees during the last two years).

[Insert Table 4]

The table verifies Finnvera’s dominant role in the provision of government funding to SMEs, and yet qualifies it in an important way. Comparing across columns tells us that despite the fact that Tekes only accounts for about 14% of the total government funding to SMEs, high R&D SMEs, SMEs with patents, high export SMEs, and SMEs with (other) foreign operations are in absolute terms (i.e., not just compared to their counterparts) more likely to apply for and receive funding from Tekes than from Finnvera (or from any other government institution). This finding is important, because it is

⁴⁰ KPMG Wideri, Arthur Andersen, SVH PriceWaterhouseCoopers, Tuokko Deloitte & Touche, or Tilintarkastajien Oy Ernst & Young.

consistent with the idea that different types of SMEs apply for and receive different types of government funding.

Comparing across rows allows us to uncover four patterns worth emphasizing:⁴¹ First, technology-intensive SMEs (high R&D SMEs, SMEs with patents and/or intangible assets) are more likely than their counterparts to apply for and receive funding from both Tekes and Finnvera. Second, the same applies to internationally oriented SMEs (high export SMEs, SMEs with (other) foreign operations and SMEs audited by the international recognized auditors), as also they are more likely than their counterparts to apply for and receive funding from both Tekes and Finnvera. Similar patterns underlie the other types of funding too, but far less prominently and not with respect to all the variables considered. Third, SMEs whose loan applications have been rejected in private credit markets are more likely than their counterparts to apply for and receive financing from Finnvera. Interestingly, this is not the case for the other types of funding. Finally, the table shows that of the 13 SME characteristics considered, only four share an important common effect: Large SMEs, high growth SMEs, SMEs who own patents and SMEs whose profitability has improved recently are more likely than their counterparts to apply for and receive government funding from *any* institution.

The foregoing findings indicate that there are selection processes at work. We cannot however make too much out of them, because we have not controlled for the other characteristics of SMEs. To control for them requires that we use multivariate methods. That is done in the next section.

4.2 Econometric Analysis

Regressions Analysis

The main empirical model that we employ to study the characteristics of SMEs that apply for and receive government funding is the standard Logit model:

$$y_i^g = 1(\beta' X_i + \varepsilon_i > 0) \quad (1)$$

⁴¹ It is important to note that we have not been able to test the statistical significance of these patterns. The reasons for this are that there are low frequencies of SMEs financed by government venture capital (small number of observations in the sample), and that there are low expected frequencies in the case of some of the categories (over 20% of cells have expected frequencies less than 5).

where y_i^g is a dummy set to one if firm i has applied for and received government funding from government institution g , β is a vector of coefficients, X_i is a vector of explanatory variables and ε_i is distributed according to a logistic density with mean zero and constant variance. We run Logits separately for each government institution to investigate whether there are systematic differences between the institutions in the allocation of SME finance.

The characteristics of firms that we control for are, bar a few modifications, the same as those used as the conditioning variables in Table 4. They are AGE_i , EMP_i (= the number of employees), $GROWTH_i$, $HIGHRD_i$ (= dummy set to 1 if firm's lagged $R \& D_i > 5\%$), $PATENT_i$, $INTANG_i$, $HIGHEXPOR_i$ (= dummy set to 1 if firm's $EXPOR_i > 25\%$), $FOREOPER_i$, $AUDIT_i$, $PROFIT_i$ and $PROFITCH_i$ and, finally, $LOANDEN_i$.

We also introduce eight new control variables. The first one is a dummy for 'small SMEs' SD_i (= dummy set to one if firm's sales are less than euro 1.5 million). The second one is 'small R&D intensive firms', SRD_i (= dummy set to one if the ratio of firm's R&D to sales exceeds 10% and if its sales are less than euro 1.5 million). We introduce the dummy, because lack of capital has in the past been identified as one of the most important 'barriers to innovation' for small R&D intensive firms (CSO 1991). We also bring in two new controls for the innovativeness of firms. They are $INNO1_i$ (= dummy set to 1 if firm has innovated its products during the last three years), and $INNO2_i$ (= dummy set to 1 if firm has innovated its production processes during the last three years). We also add two variables to control for the characteristics of the CEO of the firms. These are $CEOAGE_i$ (= the number of years firm's current CEO has managed the firm), and $CEOEDUC_i$ (= dummy set to 1 if firm's CEO has a university degree). Finally, all of the regressions include $REGION_i$ (= a dummy set to 1 if firm resides in an agricultural municipality), broad sector dummies (the sectors are high-technology (reference category), medium technology, information intensive services, and other), as well as dummies indicating in which province the firm resides in (the provinces are Province of Uusimaa (reference category), Province of Western Finland ("West"), Province of Eastern Finland ("East"); and Province(s) of Oulu and Northern Finland ("North")).

Table 5 provides results of estimating equation (1) for Finnvera's and Tekes's funding, as well as for government venture capital and other subsidies. In each column, the dependent variable is a dummy set to one if a firm has applied for and received the type of government funding in question.

The table shows that, overall, there are systematic differences between SMEs that apply for and receive different types of government funding. It also shows that we can find further support for two of the four patterns that we discovered above. First, technology-intensive SMEs (high R&D SMEs, SMEs with patents) are more likely than their counterparts to apply for and receive funding from Tekes but *not* from Finnvera. Second, as before, we find that internationally oriented SMEs (high export SMEs, and SMEs audited by the international recognized auditors) are more likely than their counterparts to apply for and receive funding from both Tekes and Finnvera. Third, we also again find that SMEs whose loan applications have been rejected in private credit markets are more likely than their counterparts to apply for and receive financing from Finnvera. We find no similar effects for the other types of government funding. Finally, it seems that there are only few, if any, SME characteristics that have a similar effect across the various types of government funding on the probability that an SME applies for and receives government funding.⁴²

The regression results also provide us with some additional insights. We have chosen to emphasize the following four:

- *Small R&D intensive firms* apply for and receive government funding more often than their counterparts only from Finnvera.
- *Growth-oriented SMEs* apply for and receive government funding more often than their counterparts only from Finnvera.
- *Younger SMEs* apply for and receive government funding more often than their counterparts only from Tekes.
- *Smallish SMEs* with a limited amount of sales are systematically less likely than their counterparts to apply for and receive all types of government funding except government venture capital.

A final point to bring forward is that SMEs that belong to "Other" sectors, i.e. not technology- or information intensive, are less likely to apply for and receive all but Finn-

⁴² In particular, the four SME characteristics that seemed to systematically classify SMEs to users and nonusers of government funding, no longer work. If anything, this finding illustrates the benefit of using multivariate techniques.

vera's financing. This is interesting since the main characteristics that make the sectors different, such as innovativeness, are controlled for.⁴³

[Insert Table 5 here]

Because to apply for and receive government venture capital (provided by Sitra and regional governmental/semi-governmental venture capital firms) are "rare events", i.e., it is *much* less likely that an SME applies for and receives financing (events) than that it does not apply for or receive (nonevents) financing from them, Logit regression can underestimate the probability of the event and yield biased coefficients in small samples. The problem is that in rare events data, ones are statistically more informative than zeros. To address the problem, we re-estimate model (1) using a rare events logistic regression recently developed by King and Zeng (2000, 2001). The method proposed by King and Zeng corrects for problems due to finite sample or rare events. When the results make a difference, the method should work better than the standard logistic regression; when it does not, it gives the same answer as the logistic regression.

Table 6 provides results of estimating equation (1) using the rare events Logit. The table shows that our qualitative conclusions do not change, even though the magnitude of some coefficients has changed. With these potentially better estimates at hand, we can compute relative risks, i.e., the percentage changes in the probability of something happening, due to a change in selected explanatory variables. We do not report the relative risks in a table to save space, but just briefly discuss some of them: the probability that an SME applies for and receives Finnvera funding is about two times larger if its loan application has been rejected on the market place ($LOANDEN_i = 1$) than if it has not been rejected ($LOANDEN_i = 0$). Similarly, the probability that an SME applies for and receives Tekes funding is as much as two and a half times larger if it is an R&D intensive firm ($HIGHRD_i = 1$) than if it is not ($HIGHRD_i = 0$). Finally, the probability that an SME applies for and receives Finnvera (Tekes) funding would be 1.7 (1.5) times larger if it was an export intensive SME ($HIGHEXPORT_i = 1$) than if it was not ($HIGHEXPORT_i = 0$).

[Insert Table 6 here]

⁴³ It is perhaps of some interest to note that SMEs that reside in the Western- and Eastern Provinces, are more likely to apply for and receive financing from Finnvera and Tekes than those SMEs that reside in the Province of Uusimaa.

Count Model Analysis

Calls for a better co-ordination between the various government institutions providing SME funding have recently increased.⁴⁴ There are several rationales to enhance the degree of co-ordination. One is that it may be difficult to evaluate the pros and cons of SMEs' technological projects (pre-commercial research) without simultaneous consideration of their ability to later commercialize government-funded technology (Lerner 2002). Enhancing coordination might therefore improve the commercialization of technology. Another rationale for coordination is that there might be a coordination problem between the various government institutions providing SME funding that results in undesirable time-series variation in the total amount of financing available to SMEs (just as our evidence suggests). Finally, evidence from the US suggests that firms that receive research grants from numerous government sources may be underachieving, i.e., they have few, if any, tangible results to show from previous R&D awards (Lerner 1999, 2002 and Gompers and Lerner 1999). As suggested by Lerner (2002), the problem with such firms is that they can attribute the lack of results to the high-risk nature of their projects. This means that firms can drift from one government agency to the next and avoid accountability for a long time, if not indefinitely and suggests that lack of co-ordination can lead to misallocation of government funding.

In our (estimating) sample, there are 262 SMEs that have received at least one type of government funding. Of these, about 32% have received more than one type of government funding. We can study the characteristics of these SMEs using Poisson regression model for count data. The primary equation in the Poisson model (Greene 2000, p. 880) is

$$Prob(Y_i = y_i) = \frac{e^{-\lambda_i} \lambda_i^{y_i}}{y_i!} \quad (2)$$

where $y_i = 0, 1, 2, 3, \dots$ and where typically $\ln(\lambda_i) = \beta' X_i$. In our case, the dependent variable is the number of government institutions from which an SME applies for and receives funding. We use the same vector of explanatory variables as above.

⁴⁴ A consequence of such calls is, at least in part, that the government institutions providing public support to Finnish firms have recently launched a joint internet-service "Yritys-Suomi", which collects the different products and services offered by the various institutions, and serves as the point of information for SMEs.

Table 7 provides results of estimating a standard regression model (with $y_i = 0, 1, 2, 3, \dots$ as the dependent variable) using OLS and equation (2) using maximum likelihood methods. The table shows that *growth-oriented and younger SMEs* are more likely to apply for and receive more than one type of government funding. So are larger, export-oriented and unprofitable firms as well as SMEs who have innovated their products or production processes during the last three years. What is interesting is that the table also shows that i) *small R&D intensive firms* are neither more nor less likely to apply for and receive more than one type of government funding, ii) that *smallish SMEs* are *less* likely to apply for and receive more than one type of government funding, and finally iii) that SMEs audited by the Big Five international accounting firms are more likely to apply for and receive more than one type of government funding.

[Insert Table 7 here]

4.3 Assessment

We find that as many as every third SME has hitherto applied for and received at least one type of government funding. Further, nearly every fifth Finnish SME has recently applied for and received at least one type of government funding. We also find that of the recently supported SMEs, every third SME has received more than one type of government funding. If anything, these findings indicate the Finnish government is rather heavily intervening in the market for SME finance.

What can be deduced from our econometric analysis? To answer the question, we must first emphasize that the data generated by selection processes is in sharp contrast to the data that we would observe if government funding was allocated across firms randomly. If we find that the probability that SMEs apply for and receive government funding is in no way related to, say, their R&D intensity, it indicates that SMEs apply for and receive government funding independently of their R&D intensity (holding other things constant).⁴⁵ However, if we find for example a positive relation, it tells us something about the two selection processes. On the one hand, it suggests that firms that are, on average, R&D intensive, have applied for government funding. On the other

⁴⁵ There is a theoretical possibility that firms that are, on average, more (less) R&D intensive, have applied for government funding, but that the screen of the government organization providing the funding systematically discriminates against (favors) R&D intensive firms. In this case, we find no relation if the two selection processes cancel each other *exactly* out. In our view, that hardly is likely.

hand, it suggests that the screen of the government organization providing the funding favors (does not discriminate against) R&D intensive firms. Of course, it may be that both selection processes work towards the same direction, enforcing each other.

Overall, it is rather encouraging to find that the econometric results are consistent with the official rhetoric and the general idea of what the institutions are set to do. For example, the probability that an SME applies for and receives Finnvera funding is much larger if its loan application has been rejected in the market place than if it has not been rejected. Similarly, the probability that an SME applies for and receives Tekes funding is much larger if it is an R&D intensive firm than if it is not. Because these effects are large, they should not be taken at face value. They do indicate, however, that there are strong selection processes at work.

It is also encouraging to find that there are only few, if any, SME characteristics that have a similar effect across the various types of government funding on the probability that SMEs apply for and receive government funding. This suggests that different types of SMEs apply for and receive different types of government funding. What is not as encouraging to find is the following: The *only* characteristic that seemed to reduce the likelihood of applying for and receiving government funding across all types of government funding except government venture capital was the smallness of an SME. This importance of realized sales is interesting since many of the characteristics that make the SMEs different, such as their size, growth-orientation, and innovativeness, are controlled for. It may be indicative of many things, including too high application costs and a possible bias against funding SMEs with little realized sales.⁴⁶

Our econometric results indicate that the characteristics explaining why some SMEs are more likely than their counterparts to obtain many types of government funding are quite in line with what one would expect. Examples of such characteristics are the growth-orientation of an SME and its ‘innovativeness’ in the recent past. A not so encouraging finding is, however, that one of the characteristics is whether an SME audited by one of the “Big Five” accounting firms. The systematic pattern is, in fact, consistent with a wrong kind of self-selectivity: firms audited by the Big Five should, despite the recent Enron scandal, be more “transparent” and therefore more likely to obtain funding in the market place, holding other things constant (see Hyytinen and Pa-

⁴⁶ If problems in commercialization of technology means little realized sales, the finding may be indicative of wrong kind of selectivity in the allocation of government funding. It therefore calls, if anything, further research.

jarinen 2002b and the references therein). It is also inconsistent with the idea that the government institutions are overcoming the information problems that the private sector cannot and thus solving the fundamental problem of finding out those truly eligible for government funding. While our analysis does not allow us to exclude other explanations, a danger is that these firms drift from one government agency to the next because they have found that it is a means to enhance their profits.

5 Conclusions

Not unlike elsewhere, the government in Finland has been keen to provide funding to Finnish firms, especially SMEs. In this paper we review, in the light of the economic rationales for public efforts to finance SMEs, all of the government institutions providing SME funding in Finland, and what the institutions are set to do. Using recently collected data on SMEs, we then explore what kinds of SMEs apply for and receive government funding in Finland and whether there are systematic differences between SMEs that apply for and receive different types of government funding.

Our main findings are as follows:

- The rhetoric in the legislation on what the institutions are set to do is not fully in line with what the economic rationales suggest.
- The total amount of government funding awarded to SMEs has over the past four years grown quite rapidly (according to our estimates, as much as 18% in real terms). Moreover, it seems that the growth has coincided with increases in the availability of external finance on the marketplace.
- As many as every third SME has applied for and received at least one type of government funding. If anything, the finding indicates that the Finnish government is rather heavily intervening in the market for SME finance.
- Overall, the econometric results are consistent with the official rhetoric and the general idea of what the institutions are set to do. For example, the probability that an SME applies for and receives Finnvera funding is much larger if its loan application has been rejected in the market place than if it has not been rejected. Similarly, the probability that an SME applies for and receives Tekes funding is much larger if it is an R&D intensive firm than if it is not. While these findings suggest that there are selection processes at work, one cannot draw conclusions about selectivity (i.e. whether the ‘right’ SMEs get

financed) nor about the welfare effects of government funding (cf. de Meza 2002).

- There are only few SME characteristics that have a similar effect across the various types of government funding on the probability that SMEs apply for and receive government funding. This suggests that different types of SMEs apply for and receive different types of government funding. The only characteristic that seemed to reduce the likelihood of applying for and receiving government funding across all types of government funding (except government venture capital) is the smallness of an SME in terms of turnover.

The results of this paper indicate that the characteristics explaining why some SMEs are more likely than their counterparts to obtain many types of government funding are quite in line with what one would expect. We find however that SMEs who are audited by one of the “Big Five” accounting firms are more likely to obtain many types of government funding. This kind of evidence is consistent with a wrong kind of selectivity.

Taken together, our results suggest that the fundamental screening problem of finding out SMEs truly eligible for government funding is perhaps not addressed adequately in practice. If SMEs receive funding regardless of whether it is needed, there is a danger that the institutions providing government funding “can claim credit for the firms’ ultimate success even if the marginal contribution of the public funds was very low” (Lerner 2002, p. 14; see also Jaffe 2002). Worse yet, it may be that certain types of SMEs that despite the recent favorable financial development still face problems in raising external finance and that are truly in need for government funding do not get financed. To conclude, our analysis highlights the importance of emphasizing selectivity - both across SMEs and intertemporally - in the provision of government funding. Coordination between the different institutions could further be improved, too.

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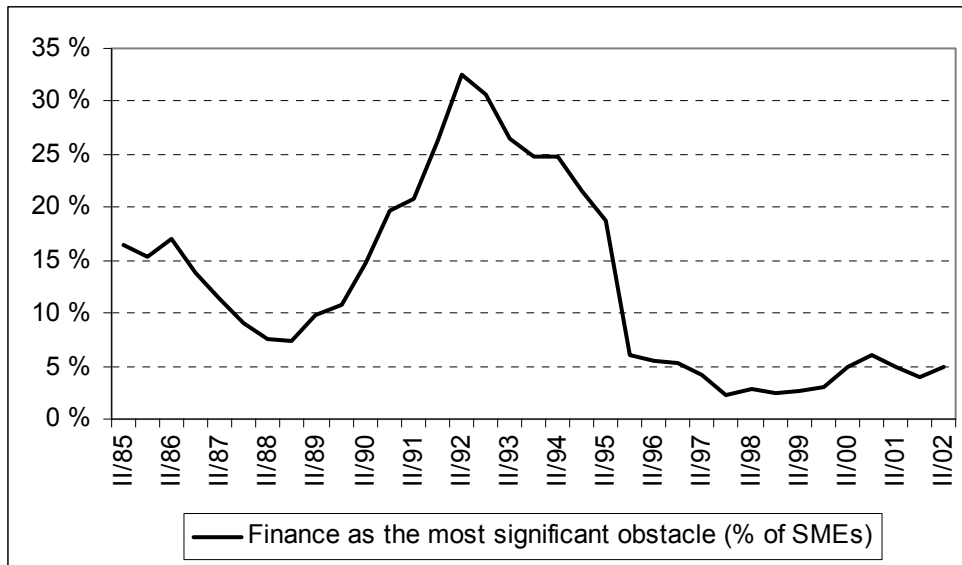
Appendix 1. Indirect Investments

[Insert Figure A1]

Appendix 2. Sample and Sample Weights

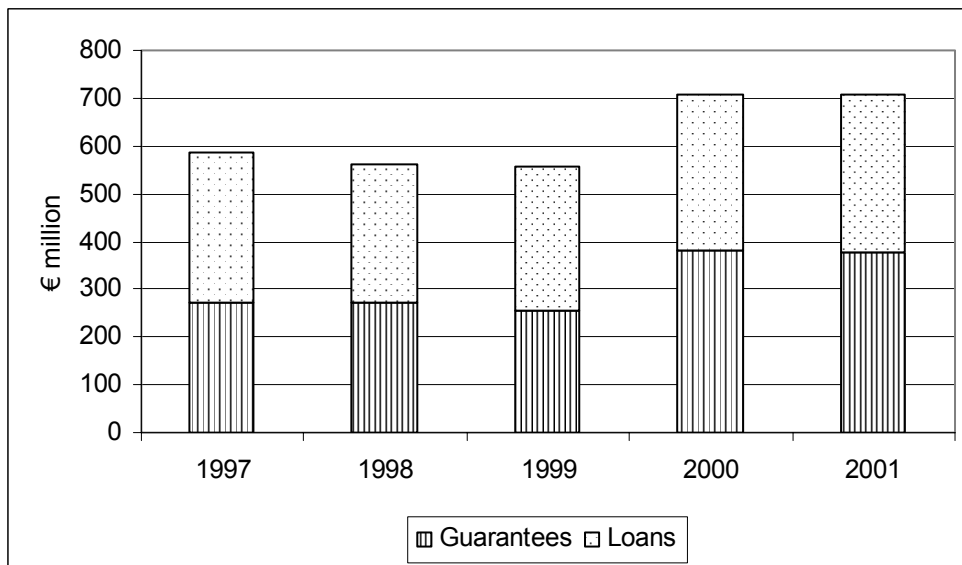
[Insert Table A2]

Figure 1. Finance as the most significant obstacle to SME development



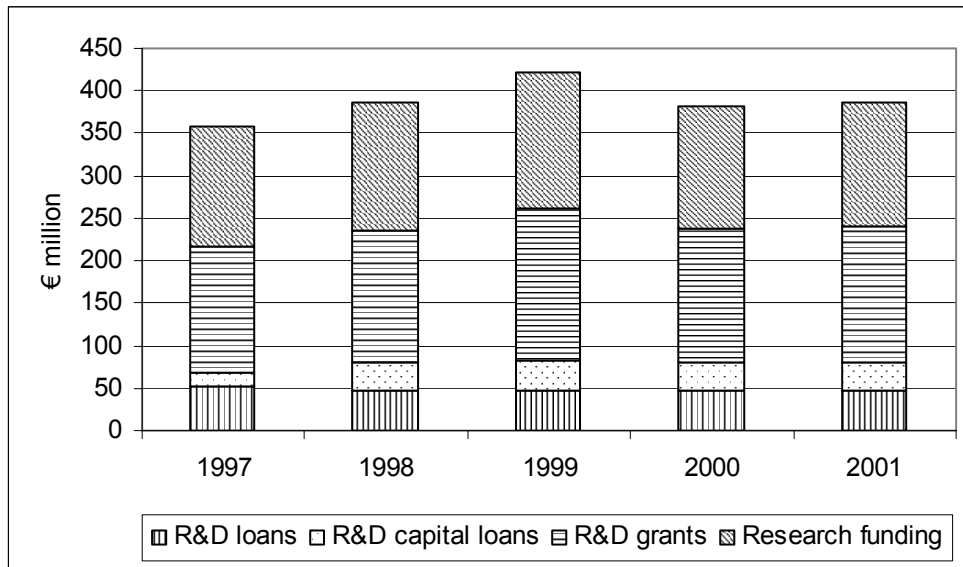
Notes: The data are from the survey “Pk-yrityksen rahoituskysely 2002”, administrated by the Federation of Finnish Enterprises and Finnvera Ltd.

Figure 2. Domestic financing granted by Finnvera 1997-2001



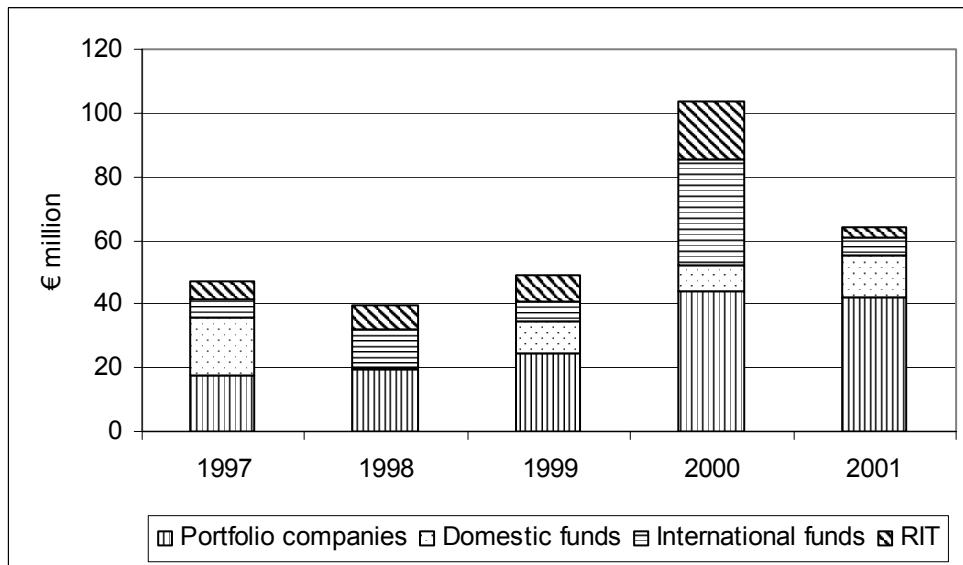
Notes: The figures for 1997-1998 are from Kera Oyj and Finnish Guarantee Board Annual Reports, and for 1999-2001 from Finnvera’s Annual Reports. The data are deflated, and measured in 2001 prices.

Figure 3. Tekes' R&D financing decisions 1997-2001

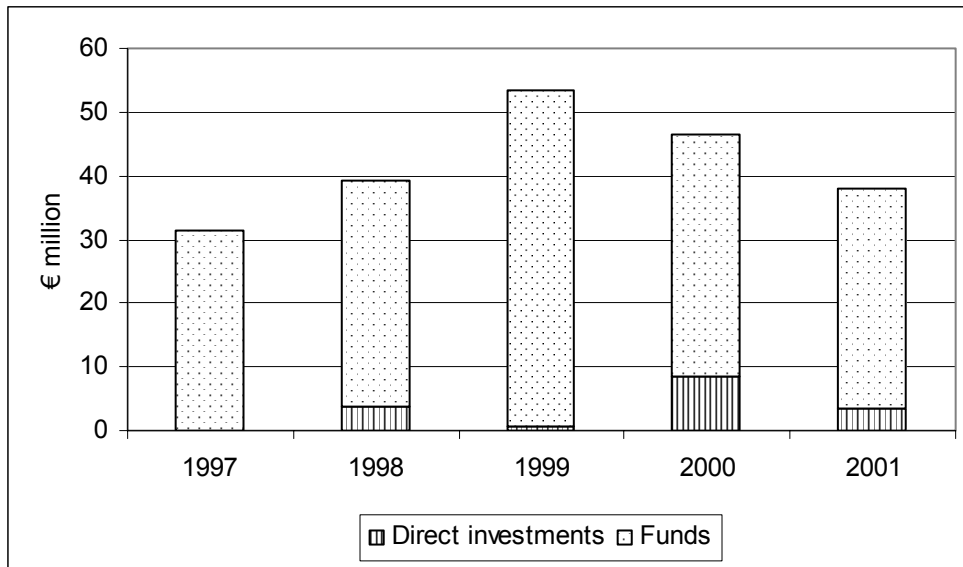


Notes: The data are from Tekes' Annual Report 2001. The data are deflated, and measured in 2001 prices.

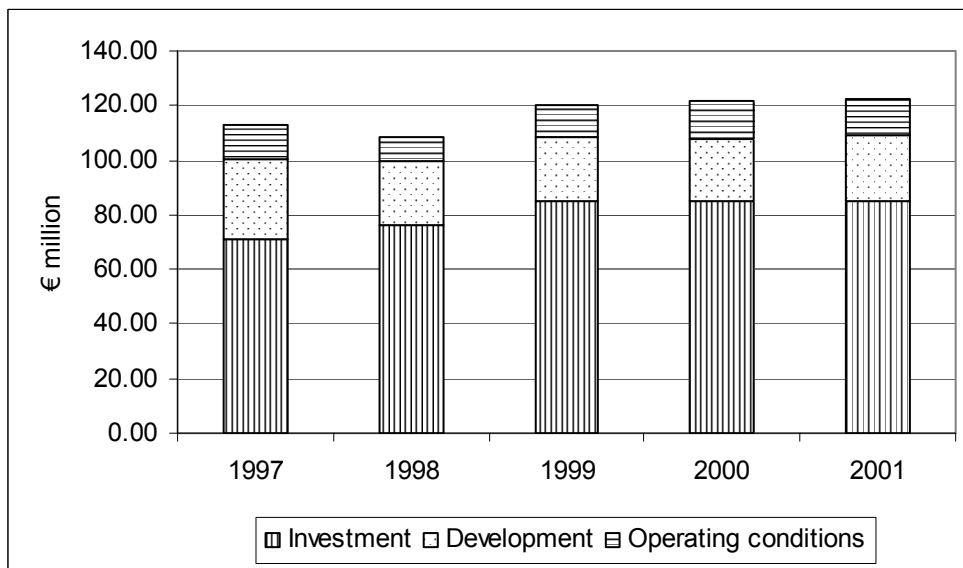
Figure 4. Sitra's financing 1997-2001



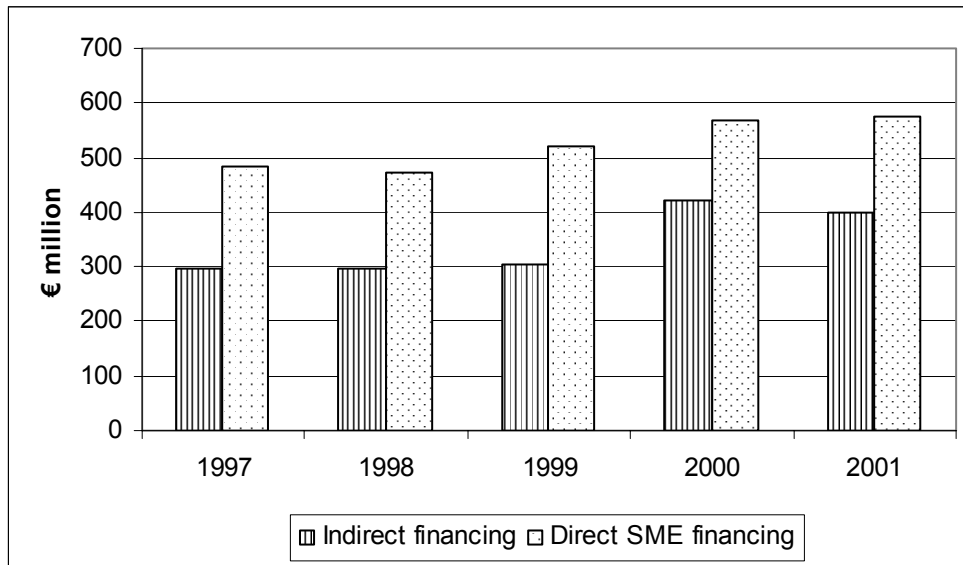
Notes: The data are from Sitra's Annual Reports 1997-2001. The data are deflated, and measured in 2001 prices.

Figure 5. FII's investments 1997-2001

Notes: The data are from FII's Annual Reports 1997-2001. The data are deflated, and measured in 2001 prices.

Figure 6. Subsidies provided by TE-Centers 1997-2001

Notes: The data are from MTI. The data are deflated, and measured in 2001 prices.

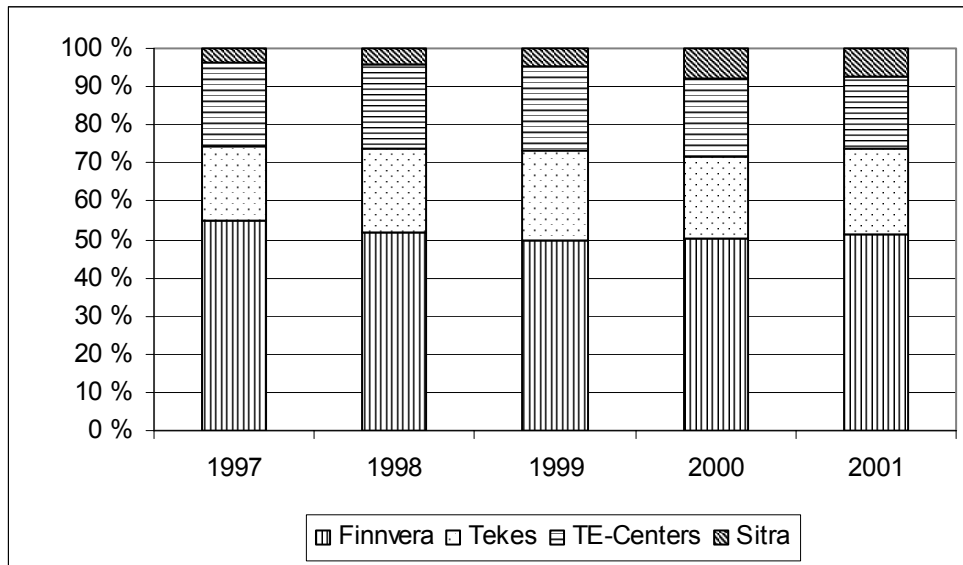
Figure 7. Total amount of government funding to SMEs 1997-2001

Notes: Direct financing refers to subsidies, loans, capital loans, and direct equity investments. Indirect financing refers to fund investments by Sitra and FII, as well as to Finnvera's guarantees and Tekes' financing channeled to SMEs via large company projects. The data are from the annual reports of the relevant government institutions and MTI. Because no figures were available for the share of financing to SMEs by Finnvera in 1997-1998, an assumption was made that the share was 85% (as it was in 1999). Of TE-Center financing, development subsidies and subsidies for improving operational conditions are 100% SME finance. For investment subsidies 1997-1999 the share of SME finance was assumed to be 94% (as it was in 2000). Of Sitra's financing, direct investments are taken to be SME finance, and indirect financing includes both domestic and international funds. The data are deflated, and measured in 2001 prices. Note that indirect financing, as we have defined it here, is not necessarily directed only to Finnish SMEs.

Table 2. Real annual growth of government funding to SMEs 1998-2001

	1998	1999	2000	2001
Panel A. Direct SME funding				
<i>Total growth</i>	-2 %	10 %	14 %	-3 %
By institution				
Finnvera	-9 %	5 %	21 %	-5 %
Tekes	15 %	16 %	-1 %	7 %
Sitra	11 %	26 %	82 %	-5 %
TE-Centres	-4 %	11 %	1 %	-7 %
<i>Average growth</i>	3 %	14 %	25 %	-3 %
Panel B. Indirect SME funding				
<i>Total growth</i>	0 %	2 %	31 %	1 %
By institution				
Finnvera	1 %	-6 %	40 %	10 %
Tekes	53 %	-5 %	-24 %	1 %
Sitra	-49 %	23 %	159 %	-54 %
FII	13 %	48 %	-28 %	-9 %
<i>Average growth</i>	4 %	15 %	37 %	-13 %
Panel C. Private sector				
Private VC investments	43 %	49 %	31 %	-18 %
Panel D. Market tightness				
"No problems in external finance"	62 %	64 %	79 %	75 %

Notes: Direct financing refers to subsidies, loans, capital loans, and direct equity investments. Indirect financing refers to fund investments by Sitra and FII, as well as to Finnvera's guarantees and Tekes' financing channeled to SMEs via large company projects. The data are from the annual reports of the relevant government institutions, MTI, the annual publications of Finnish Venture Capital Association, and from the survey administrated by the Federation of Finnish Enterprises. Because no figures were available for the share of financing to SMEs by Finnvera in 1997-1998, an assumption was made that the share was 85% (as it was in 1999). Of TE-Center financing, development subsidies and subsidies for improving operational conditions are 100% SME finance. For investment subsidies 1997-1999 the share of SME finance was assumed to be 94% (as it was in 2000). Of Sitra's financing, direct investments are taken to be SME finance, and indirect financing includes both domestic and international funds. The data are deflated, and measured in 2001 prices. Note that indirect financing, as we have defined it here, is not necessarily directed only to Finnish SMEs.

Figure 8. Shares of direct SME financing by institution 1997-2001

Notes: The data are from the annual reports of the relevant institutions.

Table 3. Proportion of SMEs receiving finance from the public institutions

	Last fiscal year and after	Prior to last fiscal year
Any institution	17.1%	27.9%
Finnvera	8.3%	19.5%
Tekes	4.9%	6.0%
Government venture capital	2.1%	2.2%
Sitra	0.5%	0.4%
Other	1.6%	1.9%
Other subsidies	5.0%	8.9%

Notes: The data is based on the survey administered by the Research Institute of the Finnish Economy (ETLA) in December 2001- January 2002.

Table 4. Proportion of SMEs receiving finance by firm characteristics

		Finnvera	Tekes	Government venture capital	Other subsidies
AGE _i	Infant	17.2%	4.4%	1.5%	6.2%
	Adolescent	5.3%	2.1%	3.7%	3.9%
	Old	7.7%	6.1%	1.6%	5.2%
EMP _i	Small SMEs	7.1%	2.7%	1.6%	3.8%
	Large SMEs	10.7%	9.2%	2.9%	7.6%
GROWTH _i	Low growth	7.6%	4.1%	1.8%	4.1%
	High growth	10.6%	8.3%	3.2%	8.6%
RD _i	No R&D	5.8%	0.6%	1.6%	2.7%
	Low R&D	9.6%	7.2%	2.7%	6.7%
	High R&D	16.5%	17.7%	2.1%	10.9%
PATENT _i	Yes	14.0%	16.4%	3.8%	7.8%
	No	8.0%	4.2%	2.0%	4.9%
INTANG _i	Yes	11.2%	8.8%	1.6%	10.6%
	No	7.9%	4.3%	2.2%	4.2%
EXPORT _i	No exports	7.5%	3.1%	1.8%	4.2%
	Low exports	7.3%	5.0%	3.0%	6.9%
	High exports	18.4%	20.8%	2.4%	7.8%
FOREOPER _i	Yes	8.4%	10.5%	1.8%	6.2%
	No	8.3%	4.5%	2.1%	5.0%
AUDIT _i	Yes	10.1%	8.2%	2.3%	4.8%
	No	8.0%	3.7%	1.1%	6.1%
PROFIT _i	Yes	7.3%	5.2%	3.5%	3.3%
	No	12.6%	3.7%	0.7%	7.0%
PROFITCH _i	Yes	7.7%	5.1%	7.5%	6.2%
	No	7.6%	4.6%	0.9%	4.8%
LOANDEN _i	Yes	17.2%	2.3%	1.1%	4.9%
	No	7.8%	5.0%	2.1%	5.0%

Notes: The data is based on the survey administered by the Research Institute of the Finnish Economy (ETLA) in December 2001- January 2002.

Table 5. Standard Logit regressions

	Finnvera		Tekes		Government venture capital		Other subsidies	
	Coeff.	z-stat.	Coeff.	z-stat.	Coeff.	z-stat.	Coeff.	z-stat.
AGE _i	-0.013	1.58	-0.020	2.30 **	-0.015	1.04	0.002	0.20
EMP _i	0.005	1.20	0.012	2.28 **	0.009	0.90	0.000	0.05
GROWTH _i	0.711	2.43 **	0.300	0.98	0.279	0.65	0.242	1.03
HIGHRD _i	-1.361	1.73 *	1.287	2.30 **	0.243	0.31	-0.671	0.95
PATENT _i	-0.196	0.57	0.780	2.41 **	0.793	1.46	-0.036	0.10
INTANG _i	0.108	0.39	0.146	0.54	0.024	0.05	0.505	1.82 *
HIGHEXPORT _i	0.656	2.09 **	0.524	1.84 *	0.007	0.01	0.346	1.05
FOREOPER _i	0.275	0.80	0.313	0.83	0.303	0.49	0.021	0.05
AUDIT _i	0.519	1.91 *	0.412	1.67 *	0.642	1.28	0.408	1.46
PROFIT _i	-0.404	1.15	-0.688	2.07 **	-1.366	2.74 ***	-0.192	0.53
PROFITCH _i	0.110	0.47	-0.074	0.30	0.668	1.48	-0.408	1.67 *
LOANDEN _i	0.871	2.10 **	-0.551	1.00	0.513	0.77	0.339	0.79
SRD _i	1.943	2.32 **	-0.612	0.95	-0.469	0.55	0.695	0.91
SD _i	-1.316	4.31 ***	-0.737	2.32 **	-0.005	0.01	-0.988	3.17 ***
INNO1 _i	0.721	2.68 ***	0.366	1.35	0.549	1.20	0.541	1.87 *
INNO2 _i	0.125	0.49	0.263	0.99	0.432	0.95	0.404	1.53
CEOAGE _i	-0.037	2.00 **	0.029	1.49	0.012	0.30	0.007	0.41
CEOEDUC _i	-0.554	1.90 *	0.311	1.09	0.184	0.38	0.180	0.61
REGION _i	-0.279	0.85	0.209	0.61	0.971	1.82 *	0.830	2.77 ***
SECTOR								
Medium-tech	0.407	1.02	-0.392	1.10	-0.516	1.01	-0.149	0.39
Info-intensive	0.018	0.04	-0.383	1.01	-0.669	1.05	-0.083	0.18
Other	0.521	1.29	-0.964	2.65 ***	-1.515	2.34 **	-0.721	1.88 *
PROVINCE								
West	0.666	2.40 **	0.497	1.93 *	-0.513	1.05	-0.006	0.02
East	0.847	2.19 **	0.781	1.96 **	0.240	0.36	-0.269	0.59
North	0.385	0.90	0.751	1.87 *	-0.800	1.11	0.210	0.48
Observations	763		763		763		763	
Log likelihood	-264.90		-262.55		-104.81		-248.24	
Wald Chi ²	106.78		130.95		86.63		80.99	
degr. of freedom	25		25		25		25	
significance	0.00		0.00		0.00		0.00	
R ² _{pseudo}	0.18		0.24		0.19		0.13	

Notes: * significant at 10%; ** significant at 5%; *** significant at 1%. The data is based on the survey administered by the Research Institute of the Finnish Economy (ETLA) in December 2001- January 2002.

Table 6. Rare events Logit regressions

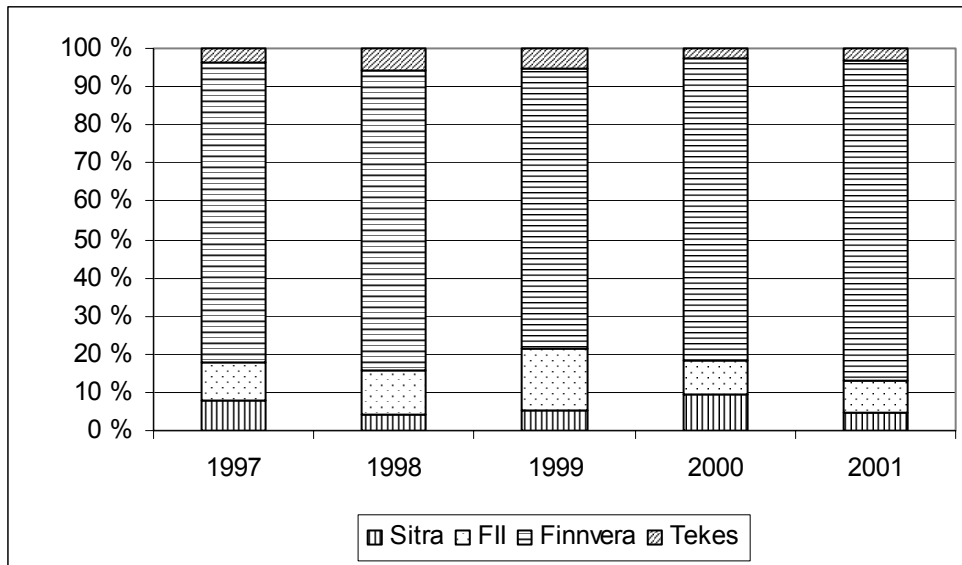
	Finnvera		Tekes		Government venture capital		Other subsidies	
	Coeff.	z-stat.	Coeff.	z-stat.	Coeff.	z-stat.	Coeff.	z-stat.
AGE _i	-0.012	1.40	-0.018	2.08 **	-0.008	0.52	0.002	0.33
EMP _i	0.005	1.18	0.011	2.18 **	0.010	1.00	0.000	0.01
GROWTH _i	0.693	2.45 **	0.317	1.07	0.291	0.70	0.281	1.23
HIGHRD _i	-1.161	1.53	1.154	2.13 **	0.393	0.53	-0.553	0.81
PATENT _i	-0.190	0.57	0.720	2.30 **	0.684	1.30	-0.037	0.10
INTANG _i	0.115	0.43	0.152	0.58	0.041	0.08	0.487	1.81 *
HIGHEXPORT _i	0.617	2.03 **	0.495	1.80 *	0.055	0.10	0.336	1.05
FOREOPER _i	0.270	0.81	0.311	0.85	0.331	0.55	0.048	0.12
AUDIT _i	0.496	1.88 *	0.395	1.66 *	0.591	1.22	0.391	1.45
PROFIT _i	-0.385	1.13	-0.653	2.03 **	-1.233	2.56 **	-0.192	0.55
PROFITCH _i	0.105	0.46	-0.070	0.29	0.585	1.34	-0.387	1.63
LOANDEN _i	0.828	2.06 **	-0.485	0.91	0.520	0.81	0.347	0.84
SRD _i	1.723	2.12 **	-0.512	0.82	-0.568	0.69	0.584	0.79
SD _i	-1.260	4.26 ***	-0.717	2.34 **	0.004	0.01	-0.942	3.12 ***
INNO1 _i	0.696	2.68 ***	0.356	1.36	0.503	1.14	0.520	1.86 *
INNO2 _i	0.125	0.51	0.250	0.97	0.404	0.92	0.385	1.51
CEOAGE _i	-0.034	1.91	0.027	1.46	0.010	0.26	0.007	0.42
CEOEDUC _i	-0.525	1.86 *	0.293	1.06	0.134	0.29	0.167	0.58
REGION _i	-0.248	0.78 *	0.211	0.64	0.902	1.75 *	0.798	2.75 ***
SECTOR								
Medium-tech	0.37	0.95	-0.38	1.10	-0.50	1.00	-0.16	0.42
Info-intensive	0.01	0.03	-0.36	0.99	-0.57	0.93	-0.08	0.18
Other	0.47	1.21	-0.92	2.61 ***	-1.37	2.18 **	-0.69	1.87 *
PROVINCE								
West	0.63	2.35 **	0.47	1.87 *	-0.46	0.98	-0.01	0.02
East	0.81	2.17 **	0.74	1.93 *	0.23	0.36	-0.23	0.53
North	0.38	0.92	0.72	1.85 *	-0.61	0.87	0.22	0.52
Observations	763		763		763		763	

Notes: * significant at 10%; ** significant at 5%; *** significant at 1%. The data are based on the survey administered by the Research Institute of the Finnish Economy (ETLA) in December 2001- January 2002.

Table 7. Count model regressions

	OLS		Poisson	
	Coeff.	t-stat.	Coeff.	z-stat.
AGE _i	-0.004	2.36 **	-0.008	2.00 **
EMP _i	0.003	1.72 *	0.004	2.11 **
GROWTH _i	0.221	2.15 **	0.219	2.09 **
HIGHRD _i	0.104	0.47	-0.039	0.19
PATENT _i	0.211	1.90 *	0.131	0.90
INTANG _i	0.079	1.08	0.165	1.42
HIGHEXPORT _i	0.270	2.90 ***	0.313	2.53 **
FOREOPER _i	0.106	1.09	0.149	1.02
AUDIT _i	0.193	2.67 ***	0.337	2.95 ***
PROFIT _i	-0.229	2.57 **	-0.392	2.76 ***
PROFITCH _i	-0.015	0.30	-0.046	0.43
LOANDEN _i	0.142	1.02	0.242	1.31
SRD _i	0.035	0.15	0.410	1.63
SD _i	-0.292	4.03 ***	-0.773	5.32 ***
INNO1 _i	0.169	3.00 ***	0.437	3.47 ***
INNO2 _i	0.096	1.50	0.233	2.08 **
CEOAGE _i	0.000	0.09	0.001	0.09
CEOEDUC _i	0.007	0.10	0.001	0.01
REGION _i	0.122	1.65 *	0.234	1.68 *
SECTOR				
Medium-tech	-0.034	0.37	-0.079	0.54
Info-intensive	-0.101	1.02	-0.150	0.84
Other	-0.143	1.78 *	-0.377	2.38 **
PROVINCE				
West	0.093	1.79 *	0.240	1.99 **
East	0.182	2.16 **	0.333	2.05 **
North	0.122	1.33	0.262	1.51
Observations		763		763
F-test		10.61		-
degr. of freedom		25		-
significance		0.00		-
R ²		0.31		-
Log likelihood		-	-590.81	
Wald Chi ²		-	360.72	
degr. of freedom		-	25	
significance		-	0.00	
R ² _{pseudo}		-	0.18	

Notes: * significant at 10%; ** significant at 5%; *** significant at 1%. The data are based on the survey administered by the Research Institute of the Finnish Economy (ETLA) in December 2001- January 2002.

Figure A1. Relative shares of indirect financing by institution

Notes: The data are from the annual reports (1997-2001) of the relevant institutions. Indirect financing refers to fund investments by Sitra and FII, as well as to Finnvera's guarantees and Tekes' financing channeled to SMEs via large company projects.

Table A2. Sample description

		unweighted		weighted	
		n	%	n	%
AGE _i	Infant	153	15.6%	125	12.8%
	Adolescent	228	23.3%	235	24.0%
	Old	597	61.0%	618	63.1%
EMP _i	Small SMEs	599	61.2%	651	66.5%
	Large SMEs	379	38.8%	327	33.5%
GROWTH _i	Low growth	587	60.0%	704	72.0%
	High growth	352	36.0%	227	23.2%
	N/A	39	4.0%	47	4.8%
RD _i	No R&D	328	33.5%	516	52.8%
	Low R&D	360	36.8%	345	35.3%
	High R&D	274	28.0%	110	11.2%
	N/A	16	1.6%	7	0.7%
PATENT _i	Yes	121	12.4%	52	5.3%
	No	855	87.4%	926	94.7%
	N/A	2	0.2%	0	0.0%
INTANG _i	Yes	215	22.0%	127	13.0%
	No	760	77.7%	851	87.0%
	N/A	3	0.3%	0	0.0%
EXPORT _i	No exports	598	61.1%	707	72.3%
	Low exports	233	23.8%	190	19.5%
	High exports	146	14.9%	80	8.2%
	N/A	1	0.1%	0	0.0%
FOREOPER _i	Yes	94	9.6%	55	5.6%
	No	884	90.4%	923	94.4%
AUDIT _i	Yes	217	22.2%	180	18.4%
	No	757	77.4%	793	81.0%
	N/A	4	0.4%	5	0.5%
PROFIT _i	Yes	771	78.8%	791	80.9%
	No	203	20.8%	187	19.1%
	N/A	4	0.4%	0	0.1%
PROFITCH _i	Yes	476	48.7%	482	49.3%
	No	475	48.6%	468	47.8%
	N/A	27	2.8%	28	2.9%
LOANDEN _i	Yes	55	5.6%	50	5.1%
	No	923	94.4%	928	94.9%

Notes: The data are based on the survey administered by the Research Institute of the Finnish Economy (ETLA) in December 2001- January 2002. The unweighted sample has over-sampled high-tech firms, thus the weighting is done by assigning different weights to industry groups to randomize the sample.

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