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WORKING PAPER

AN ASSESSMENT OF GOVERNMENT FUNDING OF BUSINESS ANGEL

NETWORKS: A REGIONAL STUDY

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March 2007
2007/455

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We would like to thank the participants of the 2006 Babson Kaufmann Entrepreneurship Research Conference (Bloomington, IN) and the 2006 RENT Conference (Brussels) for their comments on an earlier draft of this paper.

AN ASSESSMENT OF GOVERNMENT FUNDING OF BUSINESS ANGEL NETWORKS: A
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ABSTRACT

In this paper we evaluate whether government intervention through the public funding of business angel networks is warranted. Based on a regional study of four BANs, we find that these subsidies reach their goals in terms of contribution to economic development and reducing financing and information problems entrepreneurial companies face. However, they are partly based on the wrong assumptions as these companies are not (yet) value creating. Therefore, we advise caution in using the market failure argument as grounds for government intervention in the informal risk capital market.

Keywords: risk capital; business angels; policy; economic development; market failure

JEL: G24, H71, M13, R58

INTRODUCTION

Over the past decade, governments from all over the world have launched initiatives to stimulate risk capital markets (LERNER, 1999; EUROPEAN COMMISSION, 2003b), ranging from public venture capital (VC) and seed funds to co-funding of private VC funds, supporting business angel networks (BANs), incubation services and developing guarantee schemes (OECD, 1997; EUROPEAN COMMISSION, 2006). Risk capital refers to external equity financing of entrepreneurial companies and encompasses both formal venture capital (VC) and business angel (BA) investments or informal risk capital (EUROPEAN COMMISSION, 2001). Formal VC is provided by institutional, professional funds, while informal risk capital is provided by private, non-institutional investors whom have no family or friend connection with their investees (HARRISON and MASON, 1999; EVCA, 2002).

The rationale for government intervention in the risk capital market mainly stems from the widespread belief, both among academics and policy makers, that risk capital promotes innovation, economic growth and job creation (FLORIDA and KENNEY, 1988; EVCA, 2002; ALEMANY and MARTI, 2005), but that there is a market failure in the private market for risk capital for entrepreneurial firms (EUROPEAN COMMISSION, 2003b). Market failure entails that entrepreneurial companies are not able to raise sufficient funding to carry out their value-creating investment opportunities. The goal of this study is to evaluate government intervention in the informal risk capital market through the public funding of BANs in Flanders, a Belgian region. We assess whether this intervention is warranted by evaluating whether it is based on the right assumptions and has achieved its goals.

Corroborating the importance of the informal risk capital market, it is estimated that 227,000 U.S. BAs invested \$23.1 billion in 49,500 companies in 2005 (SOHL, 2005). This compares to \$21.7 billion invested by U.S. VC funds in only 2,939 companies in 2005 (PRICEWATERHOUSECOOPERS *et al.*, 2006). There is a scarcity of statistics on European BA investments. Estimates for the UK market amount to £0.5 billion to £1 billion invested per year in

3,000 to 6,000 companies, by 20,000 to 40,000 angels. The number of start-ups backed by angel investors is estimated to be 8 times the number of VC-backed start-ups in the UK (MASON, 2006).

GOVERNMENT INTERVENTION IN THE INFORMAL RISK CAPITAL MARKET

Government intervention in the informal risk capital market is based on a market failure argument (EUROPEAN COMMISSION, 2003b), caused by R&D externalities and information problems (BERGER and UDELL, 1998; MURRAY, 2007). We will first discuss R&D externalities and thereafter information problems.

R&D externalities or spillovers refer to the fact that R&D investments within a company may entail private and social returns that benefit parties outside the company (LERNER, 1999). R&D investments can, for example, benefit competitors. This phenomenon is especially relevant for high-tech companies and increases the perceived risk and uncertainty surrounding these companies (MURRAY, 2007). Considering the high perceived risks inherent to high potential companies, potential investors want to appropriate all abnormal returns generated by these companies (MURRAY, 2007). Due to R&D externalities this, however, might not be possible and hence may lead investors to provide less financing than would be socially optimal (MURRAY, 2007). Small firms might be especially prone to this problem due to “their lesser market power and inability to finance the aggressive defence of intellectual ownership infringements” (MURRAY, 2007, p. 14).

One of the factors contributing to the high perceived risk associated with entrepreneurial companies and a second source of market failure is the high level of information asymmetry, causing high uncertainty on the side of potential investors. As these companies generally do not have a track record, do not generate profits yet and do not dispose of considerable tangible assets, they are constrained from access to public capital markets and bank financing. Therefore, in addition to internally generated cash flows, they have to rely on informal or formal risk capital (BERGER and UDELL, 1998). Risk capital thus often presents the only external financing source available to value-creating

entrepreneurial companies. Both VCs and BAs usually mitigate adverse selection and moral hazard risks caused by information asymmetries through extensive due diligence pre-investment, writing extensive contracts at investment and monitoring post-investment (BERGER and UDELL, 1998). However, due to scale economies in these processes and in order to further reduce risk, VCs have shifted their focus toward larger and older investments (LOCKETT et al., 2002; EUROPEAN COMMISSION, 2003a). Furthermore, VC investments tend to be spatially concentrated and focused on a few industries (LERNER, 2002; MASON and HARRISON, 2003). Hence, it is argued that more and more small and young ventures, especially those active in regions or industries with a low supply of VC, have difficulties in raising sufficient VC even if they have value-creating investment opportunities, and hence have to resort to BA funding.

Another information problem these companies face is the lack of transparency in the informal risk capital market. Entrepreneurs are not always fully informed about the array of possible financing sources and their characteristics (VAN AUKEN, 2001). Even if they understand BA financing, they are not always able to locate appropriate BAs, as the latter often do not want to make their investment intentions public. In the same vein, BAs have trouble in locating valuable investment opportunities (MASON and HARRISON, 2002). In other words, even if BAs would be willing to invest in early-stage companies, they are not always able to as they are not always able to find these companies. These problems are at the basis of the creation of BANs, that provide an information channel between entrepreneurs and BAs, without giving up the anonymity of the latter (HARRISON and MASON, 1996b).

Conclusive evidence concerning the existence of a market failure is currently lacking (MAULA and MURRAY, 2003; JÄÄSKELÄINEN *et al.*, 2006). Despite aforementioned arguments, some authors argue that the lack of financing for entrepreneurial companies is due more to the poor quality of the demand or lack of investment-readiness of entrepreneurs than it is to the unavailability of capital (e.g. MASON and HARRISON, 2002; 2003) and thus merely represents an efficiently operating

market. The lack of financing *per se* is thus not enough to constitute a market failure; the financing constraint has to regard value-creating companies.

REGIONAL APPROACH TO INFORMAL RISK CAPITAL: THE CASE OF BUSINESS ANGEL NETWORKS

Increasingly, governments have realised the importance of a regional approach to reduce the perceived failure in the risk capital market (EUROPEAN COMMISSION, 2006), given that the subsidiarity principle implies that policy is implemented at the lowest level possible, on the condition that it is still efficient (SUNLEY *et al.*, 2005). Regional risk capital programmes are more efficient as geographic proximity is important in the early-stage investor-investee relationship. Matching demands facial contact between investor and investee in order to reduce information asymmetries and create trust (EBAN, 1998; AERNOUDT, 1999). Proximity further facilitates active coaching and advising, allowing companies to benefit more from the investor's network and effort (MASON and HARRISON, 1995; SUNLEY *et al.*, 2005). Regional initiatives may also be warranted to address specific regional market failures or equity gaps (SUNLEY *et al.*, 2005).

One regional measure aimed at facilitating early-stage funding, which has spread throughout Europe since the late nineties, is the public funding and support of BANs. Based on the evaluation of the potential of establishing regional BANs in Europe and the positive results in terms of cost-effectiveness of a pioneer program in the U.K., the Commission stimulated, facilitated and financed the establishment of BANs (EBAN, 1998; HARRISON and MASON, 1999). In the absence of an organised marketplace, BAs and entrepreneurs seeking finance have to rely on their personal network to find, respectively, investment opportunities and financing sources (AERNOUDT *et al.*, 2007). While BAs complain that they do not find enough business plans to invest in (HARRISON and MASON, 1999), entrepreneurs are often unable to locate BAs. Hence, the main goal of BANs is to provide a communication channel between investors and entrepreneurs and, thus, reduce the failure in the informal risk capital market by reducing information problems. Other measures taken to stimulate

the informal risk capital market, such as tax incentives, legislative measures, education of both BAs and entrepreneurs and co-investment schemes, cannot work effectively without first reducing these problems (MASON, 2006).

Europe counted 231 BANs in 2005, of which an estimated 68% were publicly funded (EBAN, 2005a;b). Mason and Harrison (1995) consider the underwriting of the BANs' operational costs by regional public authorities to be the most cost-effective measure to overcome the informal risk capital market failure. It was initially assumed that public subsidies were needed to launch BANs, but that they could become self-supporting after three to five years thanks to revenues from membership fees, success fees or sponsoring (HARRISON and MASON, 1996a; VAN ROMPUY, 1999). This assumption is, however, not confirmed (HARRISON and MASON, 1996a). Governments are now confronted with the question whether subsidies have to cease as initially foreseen - which would result in most BANs closing down -, or whether long-lasting structural subsidies are justified to maintain the BANs. A critical evaluation of BAN subsidies is hence timely.

The relative success of BANs has been both widely endorsed and strongly contended, but there is no agreement on their effectiveness (HARRISON and MASON, 1996a;b; MASON and HARRISON, 2002). The only BAN evaluation study to our knowledge to date, representing our only benchmark, has been the work of Harrison and Mason (1996a;b). In order to advance their work and make a thorough evaluation of the cost-effectiveness of public intervention in supporting BANs, we evaluate the support of BANs in Flanders (a Belgian region) from 1999 to 2004. We explain this government initiative in more detail below.

PUBLIC FUNDING OF BA NETWORKS IN FLANDERS

In 1999, the Flemish government decided to subsidize the first Belgian BAN, Vlerick BAN. Three other BANs were subsequently founded and subsidized, being Bizzbees, Limburg BAN and Flanders Business Network. These four BANs were the only BANs operating in Flanders from 1999 to 2004.

The Flemish government, following the European Commission's rationales, considered the BANs as a way to reduce the financing problems entrepreneurial companies face, through reducing information problems (VAN ROMPUY, 1999). The financing of the networks was considered as one way to promote entrepreneurship and innovation in Flanders (VAN ROMPUY, 1999). The four Flemish BANs ceased to exist as independent organisations in 2004. Under the impulse of the Flemish government, they merged into one large regional BAN (BAN Vlaanderen) in order to create economies of scale, with five sub-regional offices.

Together, these four BANs represented 140 BAs¹ and 58 deals in 55 different companies, in which 54 different BAs invested between 1999 and 2004. The total amount of subsidies granted to the four BANs between 1999 and 2004 was €856,741, representing 50% of their costs. The subsidy per deal was hence €14,800 or 21% lower than the €18,900 per deal for the British Department of Trade and Industry's (DTI) informal investment demonstration projects (HARRISON and MASON, 1996b).

Evaluating public funding of BANs within one region has advantages. The four BANs all operate within the same economic, legislative and fiscal environment, increasing the internal validity of the evaluation. The external validity of the study is nevertheless warranted, as the subjects of our study are representative enough to extend the results of the study to other European regions. The Flemish BANs are similar to BANs in comparable European countries. A Flemish BAN closed, on average, 4.5 deals in 2003, compared to 0.2, 4.7 and 6 deals per BAN in, respectively, Italy, the Netherlands and Spain. A Flemish BAN counted, on average, 35 BA members compared to 26 members in Germany, 35 in Italy and 45 in Spain (statistics based on EBAN, 2005a). The informal risk capital market is, however, less mature in Continental Europe than in the U.S. and U.K. (EBAN, 2005a). For example, the U.K. counted 34 BANs in 2004, a number similar to the U.S., with an average of 5 deals per BAN (EBAN, 2005b). Furthering the argument of external validity, we note that Flanders is a region with 5 million inhabitants and thus fits into the criteria suggested for establishing a BAN (EBAN, 1998). Hence, its evaluation can present interesting conclusions for other European regions.

HOW TO EVALUATE GOVERNMENT PROGRAMMES?

According to Lerner and colleagues, the “starting point for any evaluation of a government programme is the goals it was designed to achieve” (LERNER *et al.*, 2005, p. 140). Most evaluation studies hence assess whether the objectives have been reached (e.g. HARRISON and MASON, 1996b; MURRAY, 1998; BOYNS *et al.*, 2003; MAULA and MURRAY, 2003; AYAYI, 2004; LERNER *et al.*, 2005). Through BAN subsidies, the Flemish government’s ultimate goal was to stimulate entrepreneurship, innovation and job creation in Flanders by reducing the perceived information and financing problems (sub-goals) entrepreneurial companies face (VAN ROMPUY, 1999). The BANs’ mission was to create a market where entrepreneurs looking for finance and BAs looking for investments could find each other.

One further needs to assess the assumptions the initiative and its objectives are based upon (MAULA and MURRAY, 2003). The assumption the Flemish government and the European Commission made when subsidising BANs was that there was a market failure. They assumed that there were entrepreneurial companies that suffered from financing problems *and* that these companies were value creating.

Finally, in order to assess the full impact of a government programme, one needs to go beyond its direct effects (HARRISON and MASON, 1996b; LERNER, 1999). Hence, although hard to study and quantify, we will also discuss the potential indirect effects of the BAN subsidies.

Therefore, in order to exhaustively evaluate government funding of BANs, we need to answer following questions:

1. Is there a failure in the informal risk capital market?
 - a. Did the companies financed through BANs suffer from information problems and resulting financing constraints?
 - b. Are these companies value-creating?

2. Do BANs reduce the financing problems of entrepreneurial companies?
3. Do these companies contribute to economic development?
4. What are the indirect effects of the BAN subsidies?

RESEARCH METHOD

Researchers have generally used either one of two approaches to study foregoing questions. Some researchers relied on qualitative data by gathering general information on the government measures taken and/or by interviewing beneficiaries or experts (e.g. MURRAY, 1998; DOSSANI and KENNEY, 2002; MAULA and MURRAY, 2003). Other researchers used quantitative data by comparing the performance of beneficiaries to that of comparable non-beneficiaries (e.g. LERNER, 1999; AYAYI, 2004). A contribution of our study is that we combine both approaches, leading to a richer understanding and rigorous analysis of the research questions.

We first solicited interviews from the beneficiaries, being all 55 entrepreneurs and 54 BAs who were involved in a deal through one of the four Flemish BANs. This resulted in 28 interviews with entrepreneurs (response rate of 51%) and 34 interviews with BAs (response rate of 63%). These interviews allow us to gain an insight into how market participants, i.e. the entrepreneurs looking for finance and the investors, perceive market failure in terms of information and financing problems and in the contribution of BANs in reducing this failure.

As interviews provide subjective insights of market participants, we complement these with hard data, namely the financial accounts of all companies that received BA financing through one of the BANs (BAN-backed companies). We compare their financial situation prior to BA investment to that of a matched benchmark group of comparable non-BA-backed companies. We assess the financial risk of companies in both groups through traditional profitability, liquidity and leverage variables (e.g. ALTMAN, 1968; DEMERS and JOOS, 2006). In order for a market failure to exist, the financial situation of the BAN-backed companies should be substantially worse prior to BA investment than

that of the non-BA-backed companies. If not, the former should be able to access traditional financing sources, hence refuting a market failure argument.

We conduct a second pre-investment comparison, this time to companies that did not resort to a BAN but nevertheless received BA financing through the entrepreneur's personal network. This is relevant as one might argue that, in an efficient risk capital market, entrepreneurs with value-creating projects should be able to raise informal risk capital even without a BAN. First, having a poor personal network might be an indication of the inability of the entrepreneur to network with third parties that are relevant for conducting business, hence increasing the odds that the entrepreneur will not be able to develop the venture satisfactorily. Second, parties within an entrepreneur's network face lower information asymmetries, as they are able to assess more fully potential agency problems with the entrepreneur. Failure to find a personally known party to invest might be an indication of excessive agency risk. Hence, entrepreneurs with a high ability and low agency risk should be able to find a BA without a BAN. If the above reasoning holds, we expect BAN-backed companies to perform worse compared to companies that found BA financing without resorting to a BAN. If, however, the performance of both groups of companies is the same, then this is additional evidence of market inefficiencies.

Further, in order for a market failure to exist, companies facing financing constraints should have value-creating projects. In order to assess how "effectively and profitably" (MURRAY, 2007, p. 8) the BAN-backed companies employ their financing, we measure their return on assets (ROA) in the year of BA participation and two years thereafter, as a proxy for value creation. Ideally, we should compare ROA to the companies' funding cost to assess value creation. As it is difficult to estimate the funding cost of unquoted companies, we compare the ROA of BAN-backed companies to both that of non-BA-backed companies and companies that found BA financing without having to resort to a BAN. Hence, we assume that these groups of companies have a comparable funding cost². A second weakness of our approach is that we have to restrict our analysis to two years after the investment, due to data

unavailability. Most deals occurred late in the subsidy period, in 2003 and 2004; we hence do not know how these companies will develop in the long run.

In order to assess whether BAN-backed companies contribute to economic development and growth, we study the absolute amount and growth in employment and value-added – as a proxy for sales - (LERNER, 1999; EVCA, 2002) and the federal taxes paid by the BAN-backed companies (BOTAZZI and DA RIN, 2002; EVCA, 2002). Value-added is calculated as the difference between operating income and the value of inputs. Growth is calculated as the average yearly growth from the year of BA investment to the last available year (HEIRMAN and CLARYSSE, 2005). This growth measure has its limitations as it assumes a linear growth process. Furthermore, a long-term growth measure would be more desirable (LERNER, 1999), however, data unavailability does not permit us to calculate such a measure.

The population of BAN-backed companies is identified based on the complete deal list of the four Flemish BANs. The sample of companies that received BA financing through another channel is based on two sources, namely (i) the interviews with the BAs who have invested through a BAN and were asked to give the identification details of all their BA investments, (ii) a database with all the financing sources of 221 Flemish high-tech start-ups (HEIRMAN and CLARYSSE, 2005). After removing overlaps between data sources and companies that we could not further identify, we retained 44 BAN-backed companies and 66 BA-backed companies that found a BA without a BAN. The two samples were further reduced due to missing data (8 companies). Finally, companies that received BA backing before 1992 and after August 2003 were removed. The final samples consist of 34 BAN-backed companies and 50 BA-backed companies that received BA financing through another channel. The companies in the quantitative samples closely match the profile of the companies represented in the qualitative sample in terms of industry and age at BA participation.

In order to assess the marginal impact of a government programme, we need a sample of similar market participants that did not benefit from the government programme (LERNER *et al.*, 2005).

Hence we match the BAN-backed companies with non-BA-backed companies on age, industry and size (LERNER, 1999). Age is measured in the year prior to BA participation or the year of BA participation if the BA participated at start-up. Second, we match the BAN-backed companies on industry based on the NACE-BEL codes (comparable to 3-digit SIC codes). Third, we match on size, proxied by total assets. There are no significant differences between the BAN-backed sample and the matched sample with regard to age and size³.

SAMPLE DESCRIPTION

The 28 BAN-backed companies, whose entrepreneurs were interviewed, have following characteristics. The BA participated within the first two years after incorporation in 15 out of the 28 companies. Each company has, on average, received €236,571 from BAN investors. If extrapolated, this would amount to €13,0 million BA money invested through a BAN or €15.19 per Euro of government money spent on the BANs. The Flemish BAN investors invested €2,6 million per year, which is twice the amount invested by the U.K. BAs under the DTI initiative in the early nineties, €1,4 million per year (HARRISON and MASON, 1996b).

The 34 interviewed BAs, representing 36 out of the 55 BAN-backed companies, have invested €11,7 million through a BAN or €324,489 per company. Extrapolating this amount to all BAN-backed companies, we estimate that BAs invested €17,8 million through BANs, or €20.83 per Euro of government money spent⁴. Furthermore, the 34 BAs have invested an additional €22,8 million in companies that did not go to a BAN or €519,055 per company⁵. If we were to extrapolate this amount to the 54 BAs who invested through the BANs, this would come down to a total of €36,3 million. BAs' attitudes, investment behaviour and demographic characteristics are consistent with those of BAs in other countries (e.g. WETZEL, 1987; PAUL *et al.*, 2003), further supporting the external validity of our study.

We first discuss the results related to the market failure assumption (research question 1) and the ability of BANs to reduce financing problems (research question 2). Then we discuss the contribution to economic development (research question 3) and end with a brief discussion of the indirect effects (research question 4).

MARKET FAILURE: FINANCING AND INFORMATION PROBLEMS

The qualitative and quantitative analyses suggest that financing and information problems exist in the informal risk capital market.

Insert table 1 about here

More particularly, BAN-backed companies perform significantly worse in terms of liquidity and profitability compared to non-BA-backed companies before the BA investment (Table 1, Panel A). Their financial risk is higher and therefore the probability of raising financing from traditional sources such as banks is lower. This is further corroborated by the high degree of leverage of BAN-backed companies: 96% of their assets is financed with debt. This compares to 82% for the non-BA-backed sample (although the difference is not statistically significant). The qualitative interviews provide further evidence for the financing constraint argument. When asked why they opted for BA financing, 63% of the entrepreneurs stated that there were no other options. To put this in perspective, only 5 entrepreneurs referred to BA's expected involvement and value-added as a motive for looking for BA financing. Although 17 entrepreneurs stated that they had another investor or financing alternative in prospect at the time of BA investment, either banks or 3F (family, friends and fools) money, they always admitted that both options were less suitable compared to BA money. They were either reluctant to mix personal and business life or the stringent conditions that go along with bank financing were not optimal for the company. Quantitative and qualitative results hence support the

existence of financing constraints for entrepreneurial companies: these companies could probably not have found (the total amount of) financing through other sources.

We further find support for the supposed information problems in the informal risk capital market. Pre-investment, there are no major differences between BAN-backed companies and companies that received BA financing through another channel (Table 1, Panel A). Post-investment, the same holds - except for the degree of leverage two years after BA participation -, confirming the robustness of the pre-investment results. This lack of significant differences indicates that the performance of companies turning to BANs for financing is not worse than that of other BA-backed companies. In other words, BANs do *not* systematically attract the worst performing companies unable to find financing through other channels. The only difference between the BAN-backed companies and the companies that found BAs through another channel is that the former experienced information problems in locating a BA. 71% of the interviewed entrepreneurs stated they approached a BAN as this was the only known way for them to get in contact with BAs. In addition, only 5 entrepreneurs were confident that they would have found BA financing if the BANs had not existed.

Likewise, the BAs stated that they would not have known the companies without the BANs in 82% of the deals, confirming information problems. If the BANs had not existed, the BAs would thus not have been able to invest €14,2 million. In other words, each Euro of government subsidies has generated €16.63 of BA money, which otherwise would not have been invested *in these companies*. As there is a possibility that the BAs would have found other companies to invest in, the €14,2 million invested through the BANs probably overestimates the marginal impact of the BANs. However, 74% of the BAs stated that they still had funds left for additional investments, which increases the probability that the major part of the €14,2 million invested can be attributed to the existence of the BANs. Taken together, qualitative and quantitative results consistently support the existence of information problems, both for BAs and entrepreneurs, and the positive role of BANs in reducing these problems by creating a marketplace that brings BAs and entrepreneurs together. Our study

provides strong support for the assumption that the informal risk capital market is plagued by substantial information problems leading to financing constraints.

MARKET FAILURE: VALUE CREATION

The following step in our analysis is to investigate whether BAN-backed companies create value. If not, a failure to raise funds outside BANs is merely the outcome of efficient resource allocation. Funding should not be channelled to non-value-creating companies. Our results do not confirm the value-creating argument in the short term. Not only do BAN-backed companies create significantly less value than similar non-BA-backed companies, they even destroy value (Table 1, Panel B). ROA is negative in the year of the BA investment and two years later, while it is significantly higher and positive for non-BA backed companies. Hence, BAN-backed companies do not invest in a cost-effective or profitable manner. Further, this lack of (short-term) value creation is a general feature of BA-backed companies, whether they resort to a BAN or not. BAN-backed companies are again not different from companies that found a BA outside a BAN.

In conclusion, although financing and information problems do plague entrepreneurial companies, we cannot label this as a market failure (yet) as the BA(N)-backed companies are value destroying in the short term. Therefore, caution is called for in using the market failure argument as grounds for defending government programmes in the informal risk capital market. We have to bear in mind though that, due to the fact that most BAN investments are recent, the data are restricted to a period of two years after the BA investment. It is possible that these companies need more time to deploy their capital in the most effective way (LERNER, 1999). Our short-term analyses may hence underestimate their long-term value creation.

CONTRIBUTION TO ECONOMIC DEVELOPMENT

The ultimate goal of the Flemish government was to stimulate regional economic growth and development through subsidizing the four BANs (VAN ROMPUY, 1999). Important indicators of a contribution to economic development are job creation, taxes and value adding (LERNER, 1999; EUROPEAN COMMISSION, 2001).

Insert table 2 about here

The BAN-backed companies together added €31,9 million in value, from the year of BA participation onwards, or, if extrapolated to all 55 BAN-backed companies, €51,6 million. In other words, we estimate that each Euro of government subsidies spent on the Flemish BANs generated €60.26 in value-added. The average yearly growth in value added amounts to €52,770 for BAN-backed companies. This is not significantly different from the growth in value added of non-BA-backed companies. BAN-backed companies hence do not perform better or worse than comparable non-BA-backed companies.

Further, the BAN-backed companies paid €348,000 in taxes over a four-year period, starting from the year of BA participation. If extrapolated, this would come down to €526,941 in taxes paid by all BAN-backed companies. We hence estimate that each Euro of government money spent on the BANs generated a direct return of €0.66 in taxes. The BAN-backed companies pay significantly less taxes compared to the non-BA-backed companies, which is not surprising considering their significantly worse performance.

Finally, we calculate several measures for job creation by the BAN-backed companies. From the year of BA participation onwards up until the last available year, each BAN-backed company has created 1.84 jobs on average. If extrapolated, all BAN-backed companies together created 102 jobs

(187 jobs created minus 85 jobs destroyed), representing a subsidy of €8,399 per job created. Extrapolated these companies represent 495 jobs in total. As there is a high probability that these companies would not have existed without the BANs due to financing constraints, the most positive view is to consider all 495 jobs as being additional. The subsidy per job created or retained is then €1,731. This is comparable to the cost of €1,515 per job created under the DTI initiative in the U.K. (HARRISON AND MASON, 1996b). BAN-backed companies had an average yearly growth of 0.66 FTE, which is not different from employee growth in non-BA-backed companies.

The Flemish government thus succeeds in stimulating economic development and growth through the subsidization of BANs. BAN-backed companies contribute as much as do companies that found BA financing without a BAN and do not contribute less or more than non-BA-backed companies in terms of value-added and job creation, but do pay somewhat less taxes.

INDIRECT IMPACT OF THE BAN SUBSIDIES

An exhaustive evaluation of a government initiative needs to go beyond its direct effects (HARRISON and MASON, 1996b; LERNER, 1999). In addition to bringing entrepreneurs and investors together, BANs may provide other benefits. The four main indirect effects are raising the awareness and legitimacy of BA financing, providing coaching and advice to both investors and entrepreneurs (which for the latter also entails feedback from potential investors), providing education to enhance investor readiness for both entrepreneurs and BAs and, finally, the possibility for the entrepreneurs to raise further financing thanks to the BA financing, both at the time of BA financing and later (HARRISON and MASON, 1996a;b; LUMME *et al.*, 1998). Although hard to quantify, we briefly discuss each of these impacts.

Due to the anonymity preference of BAs and the fact that entrepreneurs often have incomplete knowledge of the financing sources that they have at their disposal (VAN AUKEN, 2001; PAUL *et al.*, 2003), raising the awareness of potential market participants is an important task of a BAN. Both

interviewed entrepreneurs and BAs support the idea that the BANs have conducted a considerable awareness campaign towards potential investors and entrepreneurs with regard to the existence of BA financing and its characteristics. Furthermore, both parties considered this task to be important.

Further, BANs have an advisory and educational role to play towards entrepreneurs and investors. They can help entrepreneurs on how to put together a business plan or how to present themselves to potential investors. If a BA is not the most appropriate source of funding, BANs can refer entrepreneurs to other, more suitable institutions such as banks or VCs. The feedback provided by the BAs themselves may also be important. Even if entrepreneurs do not find an interested or appropriate investor through a BAN, they might advance in their professional development based on feedback received from the BAs they talked to. Education and training is a related task. BANs often provide specialized courses to both investors and entrepreneurs such as negotiation, taxation or valuation courses. Based on our interviews, we found that, although BAs consider the BANs to do a rather good job when it comes to educating the entrepreneurs, they would advise them to do a better job in educating the BAs although they do not consider this to be an important task. The entrepreneurs praise the BANs even more when it comes to educating and informing market participants.

A final side effect of BANs' existence is the fact that BA funding might enable entrepreneurs to "unlock further finance" (HARRISON and MASON, 1996b, p. 768) and raise follow-on financing. The average BAN-backed company received €243,518 from BAs not connected to a BAN. Further, ten entrepreneurs succeeded in raising finance from other sources at the time of the BA investment. More particularly, four of them also received bank financing, four received government related financing (such as subsidies), one received 3F money, one VC financing and one money from other companies. The average amount these companies were able to raise from other sources is €233,313. Although somewhat less than the average amount unlocked by companies benefiting from the DTI initiative, i.e. €298,516 (HARRISON and MASON, 1996b), this confirms the satisfactory performance of the Flemish subsidies.

Further, 61% of the entrepreneurs state that the financing they received from the BAs had a positive impact on their follow-on financing. Corroborating this statement, fourteen companies were able to raise follow-on bank financing, two companies VC financing and four other companies raised financing through other channels such as government subsidies. On average, these companies raised another €365,000 following BA financing. According to Harrison and Mason (1996b), one quarter of the companies should be able to attract at least 50% of the original amount in terms of follow-on financing. In this sense, the Flemish BANs performed well as one quarter of the BAN-backed companies were able to raise 168% of the original amount.

These qualitative and quantitative results support the statement that the Flemish BANs, in addition to positive direct effects, also create important positive indirect effects.

CONCLUSION AND DISCUSSION

The goal of this study is to evaluate whether government intervention in the informal risk capital market through BAN subsidization is warranted. We first assess whether the subsidies have reached their goals, namely reducing the financing problems value-creating entrepreneurial companies struggle with and, by doing so, stimulating economic development and growth. Second, we assess whether this intervention was based on the correct assumptions. Government intervention in the risk capital market has traditionally been based on the widespread belief of the existence of a market failure. Therefore, we evaluate whether there is a failure in the informal risk capital market, i.e. whether there are value-creating companies that face substantial financing problems, due to information problems or R&D spillovers. In order to make our evaluation as exhaustive as possible, we also assess the subsidies' indirect effects.

Based on quantitative and qualitative data, we find clear evidence of BANs reducing the information and financing problems the entrepreneurial companies face. Further, these companies do contribute to economic development and growth. In this sense, the Flemish subsidies are a success as

they reached their goals. However, our results do not provide support for the market failure assumption. The BAN-backed companies have suffered from financing and information problems, but these companies are not (yet) value creating. Their pre-investment financing difficulties seem to be the result of an efficient market operation, which then refutes the grounds for government intervention. On the upside, we note that the Flemish BAN initiative produced important indirect effects and, further, compares well to the UK's DTI initiative, our only benchmark (HARRISON and MASON, 1996b). In conclusion we state that, despite the BAN subsidies' positive direct and indirect effects, government intervention through BAN subsidization is partly based on the wrong assumptions and is therefore not entirely warranted. Nevertheless, in order to see whether BAN-backed companies are truly value creating, and thus governments do need to step in, a more long-term evaluation is indispensable.

Our study of course has its limitations. First, we mainly focused on the subsidies' direct effects. We gathered some information on the externalities associated with these subsidies, but this information is generally hard to quantify. In this respect, the impact of the government subsidies might be underestimated. Second, some positive outcomes, such as the gain in BA money invested due to the existence of a BAN, might be over-estimated. Third, one could argue that the correct comparison to make would be to compare publicly funded BANs with non-publicly funded ones. However, as none of the Flemish BANs would have existed without the subsidies, it is clear that these were instrumental in setting up and running the BANs. Moreover, there were (and still are) no BANs in Belgium operating without regional subsidies (EBAN, 2005a). As the ultimate goal of BAN subsidies is to reduce information and financing problems, not merely to run a BAN, we consider it more relevant to study the ultimate beneficiaries of the measure, being the companies and BAs involved. Finally, our study is limited to BANs in one region, Flanders. However, as mentioned before, we do not consider this to be an important threat to the external validity of our study.

In addition to resolving the above-mentioned limitations, we have other suggestions for further research. First, as most BAN investments are rather young, we were only able to gather short-term post-investment data. In order to assess the value creation of BAN-backed companies, however, long-

term analyses are essential. Further, with regard to the BAs' involvement in and value-added for their portfolio companies, it would be interesting to make a performance comparison between the portfolio companies of more and less experienced BAs. Another interesting avenue for further research would be to compare companies that had financing alternatives prior to BA investment with those without.

Despite its limitations, our study has several contributions. First, we contribute to the academic evaluation literature, as there is a scarcity of evaluations of government programmes. Furthermore, we contribute methodologically by combining quantitative and qualitative data. This provides the possibility to falsify qualitative statements made by the market participants. Second, governments can benefit from this study as we show that moderation in using the market failure argument as grounds for intervention in the informal risk capital market is recommendable. Third, this is an interesting study for the BAs since it dispels the popular idea that BANs attract the worst-quality deals. It shows that BANs are a useful channel for increasing deal flow or for contacting investors. Finally, this study is useful to the BANs in that it confirms their role in reducing the information and thus financing problems in the informal risk capital market. Future research will, however, need to show whether the companies financed by the BANs are indeed worth it.

NOTES

- 1: This number might be slightly over-estimated as we could only exclude double counting (due to being a member of multiple BANs) for BAs that made BAN investments.
- 2: The fact that there is no significant difference in the degree of leverage between BAN-backed and non-BA-backed companies up to two years after BA participation provides some support for this assumption. The same does not hold for the BA-backed companies that did not resort to a BAN for BA financing. The comparisons with the latter group thus need to be handled with caution.
- 3: We conducted representativeness tests where possible. As we have no data on the 20 BAs who did not participate in this study, there is no way of knowing whether the 34 interviewed BAs are representative for the 54 BAs who have invested through one of the BANs. The 36 companies they

invested in are, however, representative for the 55 BAN-backed companies. These tests also hold when executed for the 28 interviewed BAN-backed companies and for the 34 BAN-backed companies that were withheld in the quantitative sample.

4: This differs from the €15.19 mentioned before since there is no perfect overlap between the interviewed BAs' investments and the interviewed companies.

5: These amounts represent a lower limit since not all BAs were willing to provide these data.

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Table 1: Test of the market failure argument

Variable (in 000 EUR)	BAN-backed compared to:			(1) Non-BA-backed companies			(2) BA-backed through another channel		
	Mean	St.Dev.	N	Mean	St.Dev.	N	Mean	St.Dev.	N
PANEL A: Pre-investment comparisons									
Return on assets (ROA)	-0.36	0.47	21	-0.00***	0.28	24	-0.28*	0.95	22
Pre-tax profit	-214.81	569.63	21	-3.83*	164.78	24	-36.41	96.98	22
Operational profit	-181.10	567.15	21	8.13**	166.92	24	-25.09	103.59	22
Cash flow	-96.52	445.21	21	35.68**	175.69	22	-3.36	97.57	22
Total debt/total assets (%)	0.96	0.60	21	0.82	0.34	24	0.81	0.56	22
PANEL B: Analysis of post-investment value creation									
ROA – Year 0	-0.45	0.54	26	0.09***	0.20	29	-0.39	0.80	27
ROA – Year 2	-1.58	5.04	21	0.08***	0.27	24	-0.28	0.46	41

*p < 0.10; **p < 0.05; ***p < 0.01

(1) For the comparisons between BAN-backed and non-BA-backed companies, we used Wilcoxon rank tests

(2) For the comparisons between BAN-backed and the other BA-backed companies, we used Mann-Whitney tests

Table 2: Evaluation of the contribution to economic development

Variable (in 000 EUR)	BAN-backed compared to:			(1) Non-BA-backed companies			(2) BA-backed through another channel		
	Mean	St.Dev.	N	Mean	St.Dev.	N	Mean	St.Dev.	N
Taxes									
Year 0	4.20	7.80	10	23.14**	66.93	21	21.82	32.78	11
Year 2	-1.17	4.17	6	27.11*	46.20	19	15.69	27.68	13
Average yearly growth									
Value-added	52.77	153.01	28	5.67	173.23	30	151.04	399.72	45
Employees (FTE)	0.66	1.66	19	0.11	1.60	13	2.99	8.64	42

*p < 0.10; **p < 0.05; ***p < 0.01

(1) For the comparisons between BAN-backed and non-BA-backed companies, we used Wilcoxon rank tests

(2) For the comparisons between BAN-backed and the other BA-backed companies, we used Mann-Whitney tests