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An assessment of government funding of business angel networks in Flanders

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3 AN ASSESSMENT OF GOVERNMENT FUNDING OF BUSINESS ANGEL NETWORKS
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ABSTRACT

We evaluate whether government intervention through the subsidization of business angel networks enhances regional economic growth. We show that, firstly, BANs reduce the information and financing problems entrepreneurial companies face. Secondly, these companies contribute to economic development and growth. Thirdly, there are positive indicators of future potential, such as an upward evolution in value creation and ability to raise follow-on financing. Finally, the programme has many positive indirect effects. This leads us to tentatively conclude that public BAN support is warranted. However, to make this conclusion more robust requires a longer-term evaluation.

JEL Codes: G24, H71, M13, R58

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

Une évaluation des finances publiques en faveur des réseaux de bailleurs de fonds en Flandres.

Collewaert et al.

On cherche à évaluer si, oui ou non, l'intervention du gouvernement par moyen des subventions en faveur des réseaux de bailleurs de fonds augmente la croissance économique régionale. On montre que, primo, les réseaux de bailleurs de fonds (BANs; Business Angel Networks) atténuent les problèmes que doivent affronter les entreprises entrepreneuriales dans les domaines de l'information et des finances. Secundo, ces entreprises contribuent au développement et à la croissance économiques. Tertio, il y a des clignotants positifs quant au potentiel futur, tels un mouvement vers le haut de la création de valeur et la capacité à trouver des finances complémentaires. Pour finir, le programme a beaucoup d'effets indirects positifs. Cela amène à conclure provisoirement que les finances publiques en faveur des BANs sont justifiées. Cependant, il faut une évaluation à plus long terme pour affirmer cette conclusion.

Capital-risque / Bailleurs de fonds / Politique / Développement économique / Distorsion du marché

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Classement JEL: G24; H71; M13; R58

Eine Bewertung der staatlichen Finanzierung von Business-Angel-Netzwerken in Flandern

VERONIEK COLLEWAERT, SOPHIE MANIGART and RUDY AERNOUDT

ABSTRACT

Wir untersuchen, ob sich durch eine staatliche Intervention in Form einer Subventionierung von Business-Angel-Netzwerken das regionale Wirtschaftswachstum verbessert. Gezeigt wird erstens, dass Business-Angel-Netzwerke die Informations- und Finanzierungsprobleme junger Firmen reduzieren. Zweitens tragen diese Firmen zur Wirtschaftsentwicklung und zum Wirtschaftswachstum bei. Drittens liegen positive Indikatoren für das Zukunftspotenzial vor, wie z. B. hinsichtlich einer Aufwärtsevolution bei der Wertschaffung und der Fähigkeit zur Sicherung von Nachfolgefinanzierung. Schließlich hat das Programm zahlreiche positive indirekte Auswirkungen. Diese Ergebnisse veranlassen uns zur vorsichtigen Schlussfolgerung, dass eine öffentliche Unterstützung von Business-Angel-Netzwerken empfehlenswert ist. Allerdings ist eine längerfristige Bewertung erforderlich, um dieses Fazit robuster zu gestalten.

JEL Codes: G24, H71, M13, R58

Keywords:

Risikokapital

Business Angels

Politik

Wirtschaftsentwicklung

Scheitern auf dem Markt

Valoración de la financiación estatal de las redes de inversión privada en Flandes

Veroniek Collewaert, Sophie Manigart And Rudy Aernoudt

ABSTRACT

Aquí evaluamos si mediante una intervención estatal en forma de subsidio de las business angel networks (BAN) o redes de inversión privada es posible aumentar el crecimiento económico regional. En primer lugar, mostramos que las BAN reducen los problemas de información y financiamiento de las sociedades empresariales. En segundo lugar, estas sociedades contribuyen al desarrollo y crecimiento económicos. En tercer lugar, existen indicadores positivos del potencial futuro, por ejemplo una evolución ascendente en la creación de valores y la habilidad para procurar una financiación de seguimiento. Por último, el programa tiene muchos efectos positivos indirectos. Esto nos lleva a concluir provisionalmente que es recomendable un apoyo público de las BAN. Sin embargo, para que esta conclusión sea más sólida es necesaria una evaluación a largo plazo.

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3 Keywords:

4 Capital de riesgo

5 Ángeles Inversores

6 Política

7 Desarrollo económico

8 Fallo mercantil

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11 JEL Codes: G24, H71, M13, R58

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INTRODUCTION

Over the past decade, governments from all over the world have launched initiatives to stimulate risk capital markets (EUROPEAN COMMISSION, 2003b; MAULA *et al.*, 2007). Risk capital refers to external equity financing of entrepreneurial companies and encompasses both formal venture capital (VC) and informal risk capital, also known as business angel (BA) financing (EUROPEAN COMMISSION, 2001). Formal VC is provided by institutional, professional investors, while BA financing is provided by private investors with no family or friend connections to their investees (HARRISON and MASON, 1999; EVCA, 2002). Sohl (2005) estimates that 227,000 U.S. BAs invested \$23.1 billion in 49,500 companies in 2005, compared to VC investors investing \$21.7 billion in only 2,939 companies (PRICEWATERHOUSECOOPERS *et al.*, 2006). There is a relative scarcity of statistics on European BA investments. Mason (2006) estimates that 20,000 to 40,000 U.K. angels yearly invest £0.5 billion to £1 billion in 3,000 to 6,000 companies, backing eight times more start-ups than VC investors.

While a small number of growth-oriented start-ups contribute disproportionately to innovation, economic growth and job creation (e.g. WONG *et al.*, 2005; FRITSCH and FALCK, 2007), policy makers believe that there is a market failure in that many entrepreneurial companies are prevented from exploiting growth opportunities due to a lack of risk capital (MASON and HARRISON, 2003; CARLSON and CHAKRABARTI, 2007). Hence they have established support programmes to stimulate risk capital financing and thereby foster economic growth (CUMMING, 2007). This perceived failure in risk capital markets is addressed either by directly increasing the supply of risk capital or by increasing

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3 expected returns to investors through decreasing taxation, improving exit markets, or reducing
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5 barriers to entrepreneurship (DA RIN *et al.*, 2006).
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10 Risk capital has been shown to have a strong regional dimension, with risk capital
11 investors often specializing in investing in a geographically concentrated region (CARLSON
12 and CHAKRABARTI, 2007; CHRISTEN, 2007). Whereas the European Commission argues
13 that VC activity needs to be regionally clustered in order to create necessary levels of
14 specialization within high-tech clusters, the OECD and some EU member states have argued
15 for a more even regional distribution (MARTIN *et al.*, 2002). Following the latter view,
16 government policies throughout Europe and the U.S. have often focused on ensuring an
17 adequate regional supply of risk capital (e.g. VENKATARAMAN, 2004; CHRISTEN, 2007).
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31 Various studies have assessed the impact of public policies aimed at stimulating formal
32 VC markets (e.g. LERNER, 1999; 2002; AYAYI, 2004; DA RIN *et al.*, 2006; CUMMING,
33 2007). There is, however, a lack of insight into the effectiveness and efficiency of policies
34 targeted towards BAs, such as tax reliefs, support of BA networks (BANs) or BA co-
35 investment funds (MAULA *et al.*, 2007). In the current paper, we evaluate one type of
36 government intervention programme to stimulate informal risk capital: the support of BANs.
37 We focus on one Belgian region, Flanders, as this allows an in-depth assessment. We assess
38 whether the programme is warranted by evaluating whether it is based on the right
39 assumptions and has achieved its goals.
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55 We proceed by providing theoretical rationales for government intervention in the informal
56 risk capital market and describe how and why the Flemish government has supported BANs.
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3 Thereafter, we discuss the research method used to evaluate the programme. In the results
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5 section, we evaluate its direct effects and briefly discuss its indirect effects.
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10 GOVERNMENT INTERVENTION IN THE INFORMAL RISK CAPITAL MARKET 11

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15 Government intervention in the informal risk capital market is based on a market failure
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17 argument, caused by R&D externalities and information problems (EUROPEAN
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19 COMMISSION, 2003b; MURRAY, 2007). R&D externalities refer to the fact that the value
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21 of R&D investments is not fully internalized, as they generate benefits for parties outside the
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23 company (LERNER, 1999). While investors would like to appropriate all returns generated by
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25 high-potential companies given their high perceived risks (DA RIN *et al.*, 2006; MURRAY,
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27 2007), R&D externalities prevent this, leading investors to provide less financing than would
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29 be socially optimal (CUMMING, 2007; MURRAY, 2007). Small firms might be especially
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31 prone to this due to “their lesser market power and inability to finance the aggressive defence
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33 of intellectual ownership infringements” (MURRAY, 2007, p. 14).
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41 A second source of market failure is the high level of information asymmetry in small and
42
43 young companies, caused by a lack of track record and profit generation and resulting in high
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45 uncertainty for investors. Hence, these companies are constrained from access to public
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47 capital markets and bank financing (DA RIN *et al.*, 2006). Moreover, R&D investments do
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49 not create collateralisable assets. As financing of low-collateral companies requires
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51 monitoring (HOLMSTROM and TIROLE, 1997), arm’s-length lenders constrain credit
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53 towards these companies (DA RIN *et al.*, 2006). Therefore, they have to rely on BAs or VCs
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55 as they more actively monitor their investments (BERGER and UDELL, 1998).
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3 VCs and BAs mitigate information problems, which may result in adverse selection and
4 moral hazard risks, through extensive due diligence pre-investment, writing extensive
5 contracts at investment and monitoring post-investment (BERGER and UDELL, 1998).
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7 However, due to scale economies in these costly processes and in order to further reduce risk,
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9 VCs have shifted their focus toward larger and older investments (EUROPEAN
10 COMMISSION, 2003a; MASON and HARRISON, 2003). Furthermore, VC investments tend
11 to be geographically concentrated and focused on a few industries (LERNER, 2002;
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13 CARLSON and CHAKRABARTI, 2007; CHRISTEN, 2007). Hence, it is argued that small
14 and young ventures, especially those active in regions or industries with little VC, have
15 difficulties in raising sufficient capital even if they have great value-creating potential.
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17 Therefore they resort to BA funding, which therefore may be particularly important in regions
18 where VC is lacking (MASON and HARRISON, 1995).
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34 Another information problem is the lack of transparency in the informal risk capital
35 market. Entrepreneurs are not always fully informed about the array of possible financing
36 sources and their characteristics (VAN AUKEN, 2001). Even if they understand BA
37 financing, they are not always able to locate BAs, as these often do not want to make their
38 investment intentions public. In the same vein, BAs have trouble in locating valuable
39 investment opportunities (MASON and HARRISON, 2002). These problems led to the
40 creation of BANs, which provide an information channel between entrepreneurs and BAs
41 without giving up the privacy of the latter (HARRISON and MASON, 1996b).
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55 Conclusive evidence concerning the existence of a market failure is lacking (MAULA and
56 MURRAY, 2003; JÄÄSKELÄINEN *et al.*, 2006), as the lack of risk capital may be due more
57 to the poor quality of the demand than to the unavailability of capital (MASON and
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3 HARRISON, 2002; 2003). Venkataraman (2004) argues that risk capital is a necessary, but
4 non-sufficient condition for fostering regional growth-oriented entrepreneurship. Intangible
5 regional assets, such as access to novel ideas, role models or region-specific opportunities, are
6 equally important. Merely injecting risk capital in a region may thus lead to promoting low-
7 quality entrepreneurship (VENKATARAMAN, 2004). The lack of financing *per se* is not
8 enough to constitute a market failure; the financing constraint has to regard value-creating
9 companies.
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22 REGIONAL APPROACH TO INFORMAL RISK CAPITAL: BUSINESS ANGEL 23 24 NETWORKS 25 26 27 28

29 Increasingly, governments take a regional approach to reduce the perceived risk capital
30 market failure (EUROPEAN COMMISSION, 2006): policy is implemented at the lowest
31 level possible, on the condition that it is still efficient (SUNLEY *et al.*, 2005). In addition to
32 addressing specific regional market conditions, regional risk capital programmes are also
33 warranted as geographic proximity is important in the early-stage investor-investee
34 relationship (SUNLEY *et al.*, 2005; CARLSON and CHAKRABARTI, 2007). For an
35 investment to take place, face-to-face contact between investor and investee is required to
36 reduce information asymmetries and create trust (EBAN, 1998; AERNOUDT, 1999).
37 Proximity further facilitates active coaching and advising, allowing companies to benefit
38 more from the investor's network and effort (MASON and HARRISON, 1995; SUNLEY *et*
39 *al.*, 2005).
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58 One regional measure aimed at facilitating early-stage funding is the public funding and
59 support of BANs. Based on an evaluation of the potential of establishing regional BANs in
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3 Europe and the positive results of a pioneer programme in the U.K., the Commission
4 stimulated, facilitated and financed the establishment of BANs in the late nineties (EBAN,
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6 1998; HARRISON and MASON, 1999). Other measures that stimulate the informal risk
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8 capital market, such as tax incentives, improved legislation, education of BAs and
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10 entrepreneurs or co-investment schemes, cannot work effectively without first reducing search
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12 problems (MASON, 2006).
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20 Europe counted 231 BANs in 2005, of which 68% were publicly funded (EBAN,
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22 2005a;b). It was initially assumed that public subsidies were needed to launch BANs, but that
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24 these could become self-supporting after five years thanks to revenues from membership fees,
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26 success fees or sponsoring (HARRISON and MASON, 1996a; VAN ROMPUY, 1999). This
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28 assumption is, however, not confirmed (HARRISON and MASON, 1996a). Governments are
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30 now confronted with the question whether subsidies have to cease as initially foreseen - which
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32 would result in most BANs closing down - or whether long-lasting structural subsidies are
33
34 justified to maintain the BANs. A critical evaluation of BAN support is hence timely. The
35
36 success of BANs has been both widely endorsed and strongly contended, but there is no
37
38 agreement on their effectiveness (HARRISON and MASON, 1996a;b; MASON and
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40 HARRISON, 2002). Harrison and Mason (1996a;b) provided the only BAN evaluation study
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42 to our knowledge and so represents our only benchmark. In order to advance their work and
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44 make a thorough evaluation of the cost-effectiveness of public BAN support, we concentrate
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46 on one region in Belgium, Flanders, from 1999 to 2004.
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55 The first Belgian BAN, Vlerick BAN, was subsidised by the Flemish government in 1999.
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57 Three other BANs were subsequently founded and subsidized. Together, they were the only
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59 BANs operating in Flanders until 2004 (after which they all merged) and all operated in the
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3 same way, through investor forums. These forums are events where entrepreneurs can pitch
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5 their ideas face-to-face to BAN members and discuss them in more depth with potentially
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7 interested BAs (EUROPEAN COMMISSION, 2003a). The Flemish government, following
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9 the European Commission's rationales, considered the BANs as a way to reduce the financing
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11 problems entrepreneurial companies face, through reducing information problems (VAN
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13 ROMPUY, 1999). The financing of the networks was considered as one way to promote
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15 entrepreneurship and innovation in Flanders (VAN ROMPUY, 1999).
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22 Together, these four BANs represented 140 BAs¹ and 58 deals in 55 companies, in which
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24 54 BAs invested between 1999 and 2004. The total amount of subsidies granted to the four
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26 BANs between 1999 and 2004 was €856,741, representing 50% of their operating costs. The
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28 subsidy per deal was €14,800 or 21% lower than the €18,900 per deal for the British
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30 Department of Trade and Industry's (DTI) informal investment demonstration projects
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32 (HARRISON and MASON, 1996b).
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39 Evaluating public funding of BANs within one region has advantages. The four BANs all
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41 operate within the same economic, legislative and fiscal environment, increasing the internal
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43 validity of the evaluation. The external validity of the study is nevertheless warranted based
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45 on following arguments. First, Belgian socio-economic indicators as income distribution,
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47 employment rate, social security fees and trade balance are similar to indicators in other
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49 European countries such as Germany, the Netherlands, France, Austria, Spain and Italy
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51 (STROOBANDT *et al.*, 2005). Second, the Flemish BANs are similar to BANs in comparable
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53 European countries. A Flemish BAN closed, on average, 4.5 deals in 2003, compared to 0.2,
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55 4.7 and 6 deals per BAN in Italy, the Netherlands and Spain, respectively. A Flemish BAN
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57 counted, on average, 35 BA members compared to 26 members in Germany, 35 in Italy and
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3 45 in Spain (EBAN, 2005a). The informal risk capital market is less mature in Continental
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5 Europe than in the U.S. and U.K. (EBAN, 2005a). For example, the U.K. counted 34 BANs in
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7 2004, a number similar to the U.S., with an average of 5 deals per BAN (EBAN, 2005b).
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10 Third, the fiscal treatment of BA investments is comparable to that in other countries, except
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12 that capital gains realised by private individuals are not taxed. Finally, Flanders is a region
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14 with 5 million inhabitants and thus fits into the criteria suggested for establishing a BAN
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16 (EBAN, 1998). Hence, its evaluation can present relevant conclusions for other European
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18 regions.
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24 HOW TO EVALUATE GOVERNMENT PROGRAMMES? 25 26 27 28

29 According to Lerner and colleagues, the “starting point for any evaluation of a government
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31 programme is the goals it was designed to achieve” (LERNER *et al.*, 2005, p. 140), which is
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33 what most evaluation studies do (e.g. BOYNS *et al.*, 2005; MAULA and MURRAY, 2003;
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35 AYAYI, 2004; LERNER *et al.*, 2005; CUMMING, 2007). Through BAN subsidies, the
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37 Flemish government’s goal was to stimulate regional entrepreneurship, innovation and job
38
39 creation by reducing the perceived information and financing problems (*sub-goals*)
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41 entrepreneurial companies face (VAN ROMPUY, 1999). The BANs’ mission was to create a
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43 market where entrepreneurs looking for finance and BAs looking for investments could find
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45 each other. In addition, one needs to assess the assumptions the initiative and its objectives
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47 are based upon (MAULA and MURRAY, 2003). The assumption the Flemish government
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49 and the European Commission made when subsidising BANs was that there was a market
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51 failure, namely that some value-creating entrepreneurial companies suffered from financing
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53 problems. Finally, in order to assess the full impact of a government programme, one needs to
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55 go beyond its direct effects (HARRISON and MASON, 1996b; LERNER, 1999). Positive
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3 indirect effects of the BAN subsidies may include the enhancement of overall awareness for
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5 BA financing or entrepreneurs' and investors' education.
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10 Therefore, in order to evaluate government funding of BANs, we need to answer following
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12 questions:
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- 15 1. Is there a failure in the informal risk capital market?
 - 16 a. Did the companies financed through BANs suffer from information problems
17 and resulting financing constraints?
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 - 19 b. Were these companies value-creating?
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- 21 2. Do BANs reduce the financing problems of entrepreneurial companies?
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- 23 3. Do these companies contribute to regional economic development?
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- 25 4. What are the indirect effects of the BAN subsidies?
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34 RESEARCH METHOD

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39 Researchers have generally used either one of two approaches to study the foregoing
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41 questions. Some relied on qualitative data by gathering general information on the
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43 government measures taken and/or by interviewing beneficiaries or experts (e.g. MURRAY,
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45 1998; DOSSANI and KENNEY, 2002; MAULA and MURRAY, 2003). Others compared the
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47 performance of beneficiaries to that of comparable non-beneficiaries using a quantitative
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49 approach (e.g. LERNER, 1999; AYAYI, 2004; CUMMING, 2007). A contribution of our
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51 study is that we combine both approaches, leading to a richer understanding and rigorous
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53 analysis of the research questions.
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3 We first solicited interviews from the beneficiaries, being all 55 entrepreneurs and 54 BAs
4 who were involved in a deal through one of the four Flemish BANs. This resulted in 28
5 interviews with entrepreneurs (including three of which managed failed companies) and 34
6 interviews with BAs. The interviews give insight into how market participants, i.e.
7 entrepreneurs and investors, perceive market failure in terms of information and financing
8 problems and in the contribution of BANs in reducing this failure.
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20 As interviews provide subjective views, we complement them with hard data, namely the
21 financial accounts of all companies that received BA financing through one of the BANs
22 (BAN-backed companies). We compare their debt capacity prior to BA investment to that of a
23 matched benchmark group of non-BA-backed companies. In order for a market failure to
24 exist, BAN-backed companies should have depleted their debt capacity prior to BA
25 investment. If not, they should be able to access traditional debt financing sources. A firm has
26 depleted its debt capacity if its financial risk, measured as the ratio of the book value of debt
27 to total assets, is high or if it does not have the capacity to service the fixed interest and
28 principal repayments attached to debt, measured by its internally generated cash flows
29 (LEMMON and ZENDER, 2004). We add profitability measures such as return on assets,
30 pre-tax profit and operational profit as further indicators of a firm's risk (e.g. ALTMAN,
31 1968).
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51 A second pre-investment comparison relates to companies that did not resort to a BAN but
52 nevertheless received BA financing. This is relevant as one might argue that, in an efficient
53 risk capital market, entrepreneurs with value-creating projects should be able to raise BA
54 financing even without a BAN. First, having a poor personal network might be an indication
55 of the inability of the entrepreneur to network with third parties that are relevant for
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3 conducting business, hence increasing the odds that the entrepreneur will not be able to
4 develop the venture satisfactorily. Second, parties within an entrepreneur's network face
5 lower information asymmetries, as they are able to better assess potential agency problems.
6 Failure to find a personally known investor might be an indication of excessive agency risk.
7 Hence, entrepreneurs with a high ability and low agency risk should be able to find a BA
8 without a BAN. If the above reasoning holds, we expect BAN-backed companies to be more
9 risky than companies that found BA financing through another channel. If, however, the risk
10 of both groups is the same, then this is additional evidence of market inefficiencies.
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25 Further, in order for a market failure to exist, companies facing financing constraints
26 should have value-creating projects. In order to assess how "effectively and profitably"
27 (MURRAY, 2007, p. 8) the BAN-backed companies employ their financing, we measure their
28 return on assets (ROA) from the year of BA participation up to four years thereafter. Ideally,
29 we should compare ROA to the companies' funding cost to assess value creation. As it is
30 difficult to estimate the funding cost of unquoted companies, we compare the ROA of BAN-
31 backed companies to both that of non-BA-backed companies and companies that found BA
32 financing through another channel. Hence, we assume that these companies have a
33 comparable funding cost². Additionally, we conduct the same analyses on value added - a
34 proxy for sales – (rescaled by total assets) as a robustness check. Value-added is the
35 difference between operating income and the value of inputs.
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53 In order to assess whether BAN-backed companies contribute to economic development,
54 we studied the absolute amount and growth in employment and value-added (LERNER, 1999;
55 EVCA, 2002) and the federal taxes paid by the BAN-backed companies (EVCA, 2002).
56 Growth is calculated as the average yearly growth from the year of BA investment to the last
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3 available year (HEIRMAN and CLARYSSE, 2005). This growth measure has limitations as it
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5 assumes a linear growth process. Furthermore, a longer-term growth measure would be more
6
7 desirable (LERNER, 1999), but unfortunately data that would enable this analysis are not
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9 available.
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15 The population of BAN-backed companies is identified through the deal list of the four
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17 Flemish BAs. The sample of companies that received BA financing through another channel
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19 is based on two sources: (i) the interviews with the BAs who have invested through a BAN
20
21 and were asked to identify all their investments, (ii) a database with the financing sources of
22
23 221 Flemish high-tech start-ups (HEIRMAN and CLARYSSE, 2005). After removing
24
25 overlaps between data sources and companies that we could not further identify, we retained
26
27 44 BAN-backed companies and 66 BA-backed companies that found a BA through another
28
29 channel. Further, companies that received BA financing before 1992 and after August 2003
30
31 were also removed. The final samples consist of 34 BAN-backed companies and 50 BA-
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33 backed companies that received BA financing through another channel.
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41 In order to assess the marginal impact of a government programme, we need a sample of
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43 similar companies that did not benefit from this programme (LERNER *et al.*, 2005). Hence,
44
45 we match the BAN-backed companies to non-BA-backed companies on age, industry and size
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47 (LERNER, 1999; PURI and ZARUTSKI, 2007). Age is measured in the year prior to BA
48
49 participation or the year of BA participation if the BA participated at start-up. Second, we
50
51 match the BAN-backed companies on industry based on the NACE-BEL codes (comparable
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53 to 3-digit SIC codes). Third, we match on size, proxied by total assets.
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SAMPLE DESCRIPTION

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8 The 34 interviewed BAs³, representing 36 out of the 55 BAN-backed companies, have
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10 invested €11.7 million through a BAN or €324,489 per company. Extrapolating this amount
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12 to all BAN-backed companies, we estimate that BAs invested €17.8 million through BANs, or
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14 €20.83 per Euro of government money spent. Furthermore, the 34 BAs have invested an
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16 additional €22,8 million⁴ in companies found through another channel or €519,055 per
17
18 company. BAs' attitudes, investment behaviour and demographic characteristics are
19
20 consistent with those of BAs in other countries (e.g. MASON, 2006), further supporting the
21
22 external validity of our study.
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29 The 28 BAN-backed companies, whose entrepreneurs were interviewed, have following
30
31 characteristics. The BA participated within the first two years after incorporation in 15 out of
32
33 the 28 companies. Each company has, on average, received €236,571 from BAN investors. If
34
35 extrapolated, this would amount to €13.0 million invested through a BAN or €15.19 per Euro
36
37 of government money spent on the BANs⁵. The Flemish BAN investors invested €2.6 million
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39 per year, which is twice the amount invested by the U.K. BAs under the DTI initiative in the
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41 early nineties, €1.4 million per year (HARRISON and MASON, 1996b).
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48 The companies in the quantitative sample closely match the profile of the companies
49
50 represented in the qualitative sample in terms of industry and age at BA participation. Further,
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52 the BAN-backed companies' profiles fit well into the traditional view on market failure.
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54 Young and/or small high-growth oriented and/or high-tech companies are the most likely
55
56 victims of a market failure, due to R&D externalities, informational opaqueness and low
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58 levels of collateral (e.g. BERGER and UDELL, 1998; DA RIN *et al.*, 2006; CUMMING,
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3 2007; MURRAY, 2007). 56% of the companies in the sample received BA financing under
4 the age of two; 71% received it under the age of five. Furthermore, the majority of our sample
5 (71%) comprises small enterprises with 10 or less employees. Finally, more than half of our
6 sample is active in technological activities, ranging from the production of natural resources
7 to ICT and R&D services, to high-tech manufacturing. Fourteen companies have failed since
8 the BA investment. Taken together, the BAN-backed companies are in the target group of
9 high-growth oriented companies with likely market failure problems (CUMMING, 2007).
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22 MARKET FAILURE: FINANCING AND INFORMATION PROBLEMS 23 24 25 26 27

28 Insert Table 1 about here
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36 The qualitative and quantitative analyses suggest that financing and information problems
37 exist in the informal risk capital market. More particularly, the pre-investment debt capacity
38 of BAN-backed companies is significantly lower compared to non-BA-backed companies
39 (Table 1, Panel A). As much as 96% of their assets are financed with debt, compared to 82%
40 for the non-BA-backed sample (although the difference is not statistically significant). Their
41 lower cash flows and profit ratios suggest that their financial risk is higher and therefore the
42 probability of raising financing from traditional sources is lower. The qualitative interviews
43 provide further evidence for the financing constraints. When asked why they opted for BA
44 financing, 18 entrepreneurs stated that there were no other options. Conversely, merely 5 out
45 of 28 entrepreneurs referred to expected BA involvement and value-added as a motive for
46 looking for BA financing. Although 17 entrepreneurs stated that they had another investor in
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3 prospect at the time of BA investment - either banks or family and friends - they always
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5 admitted that both options were less suitable compared to BA money. They were either
6
7 reluctant to mix personal and business life or the stringent conditions that go along with bank
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9 financing were not optimal for the company. Quantitative and qualitative results hence
10
11 support the existence of financing constraints for entrepreneurial companies: these companies
12
13 could probably not have found (the total amount of) financing through other sources.
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18 We further find support for information problems in the informal risk capital market.
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20 There are no differences between the financial risk of BAN-backed companies and companies
21
22 that found BAs through another channel, neither pre-investment (Table 1, Panel A) nor post-
23
24 investment (not shown in the table). This indicates that the risk of companies turning to BANs
25
26 for financing is not higher than that of other BA-backed companies. In other words, BANs do
27
28 *not* systematically attract the most risky companies unable to find financing through other
29
30 channels. The only difference between the BAN-backed companies and the companies that
31
32 found BAs through another channel is that the former experienced information problems in
33
34 locating a BA. 20 of the interviewed entrepreneurs stated they approached a BAN as this was
35
36 the only known way for them to get in contact with BAs. Conversely, only 5 entrepreneurs
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38 were confident that they would have found BA financing if the BANs had not existed.
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48 Likewise, the BAs stated that they would not have known the companies without the
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50 BANs in 82% of the deals, confirming information problems. If the BANs had not existed, the
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52 BAs would thus not have been able to invest €14.2 million. In other words, each Euro of
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54 government subsidies has generated €16.63 of BA money, which otherwise would not have
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56 been invested *in these companies*. As it is possible that the BAs would have invested in other
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58 companies, the €14.2 million invested through the BANs probably overestimates the marginal
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3 impact of the BANs. However, 74% of the BAs stated that they still had funds left for
4 additional investments. Taken together, qualitative and quantitative results consistently
5 support the existence of information problems, both for BAs and entrepreneurs, and the
6 positive role of BANs in reducing these problems. Our study provides strong support for the
7 assumption that the informal risk capital market is plagued by information problems leading
8 to financing constraints.
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20 MARKET FAILURE: VALUE CREATION 21

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24 The next step is to investigate whether BAN-backed companies create value. If not, a
25 failure to raise funds outside BANs is merely the outcome of efficient resource allocation.
26 Funding should not be channelled to non-value-creating companies.
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34 Our results do not confirm the value-creating argument in the short term. BAN-backed
35 companies create significantly less value than similar non-BA-backed companies and even
36 destroy value up to three years after BA investment (Table 1, Panel B): the mean ROA of
37 BAN-backed companies is negative, while non-BA-backed companies have positive ROAs.
38 However, the difference between the two samples becomes less significant over the years to
39 disappear in year 4 as the ROA of BAN-backed companies improves. The robustness check
40 confirms these results⁶. The results indicate a J-curve effect: BAN-backed companies do not
41 invest in a cost-effective manner in the short term, but this could be due to large up-front
42 investments resulting in delayed returns⁷.
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3 Further, negative ROAs, low value-added and an upward trend in both are also present in
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5 the sample of companies that are backed by BAs, found outside a BAN. This again indicates
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7 that there are few differences between the two groups of BA-backed companies.
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12 In conclusion, although financing and information problems do plague entrepreneurial
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14 companies, we cannot label this as a market failure yet as the BA(N)-backed companies are
15
16 value destroying in the short term. However, we do notice a J-curve trend in the measures of
17
18 value creation, what might point to the fact that these companies need more time to deploy
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20 their capital in the most effective way (LERNER, 1999). The short-term analyses may
21
22 therefore underestimate the long-term value creation potential. For now, we advise caution in
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24 using the market failure argument as grounds for defending government programmes in the
25
26 informal risk capital market but also point to the long-term potential of these companies. A
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28 longer time period is needed to see whether the positive evolution continues.
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36 CONTRIBUTION TO ECONOMIC DEVELOPMENT

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41 The ultimate goal of the Flemish government was to stimulate regional economic growth
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43 and development (VAN ROMPUY, 1999). Important indicators hereof are job creation, taxes
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45 and value adding (LERNER, 1999; EUROPEAN COMMISSION, 2001).
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50 The BAN-backed companies together added €45.2 million in value from the year of BA
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52 participation onwards, or, €73.2 million if extrapolated to all 55 BAN-backed companies.
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54 Each Euro of government subsidies spent on the Flemish BANs generated an estimated
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56 €85.39 in value added. The value added grows on average with €73.780 per year in BAN-
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3 backed companies, which is significantly more than in non-BA-backed companies. BAN-
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5 backed companies hence perform better than comparable non-BA-backed companies.
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20 The BAN-backed companies in the sample paid €547,000 in taxes in a five-year period
21 starting from the year of the BA participation. Extrapolated, all BAN-backed companies paid
22 €884,852 in taxes. We hence estimate that each Euro of government money spent on the
23 BANs generated a direct return of €1.03 in taxes. Following their J-curve type evolution, the
24 BAN-backed companies initially pay significantly less taxes than the non-BA-backed
25 companies, but this difference disappears after three years when the taxes paid by BAN-
26 backed companies increase dramatically (Table 2). It is further remarkable that they pay
27 significantly less taxes in year 3 than companies that received BA financing through another
28 channel.
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43 Finally, we assess job creation using several measures. Employee growth is significantly
44 higher in BAN-backed companies than in non-BA-backed companies and comparable to that
45 in companies that received BA financing through another channel. If extrapolated, all BAN-
46 backed companies together employ 495 people, representing 102 net jobs created (187 jobs
47 created minus 85 jobs destroyed) from the year of BA participation until the last available
48 year. Each BAN-backed company has created 1.84 jobs on average over the observation
49 period (corresponding to an average yearly growth of 0.52 FTE), representing a subsidy of
50 €8,399 per job created. As there is a high probability that BAN-backed companies would not
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3 have existed without the BANs due to financing constraints, the most positive view is to
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5 consider all current 495 jobs as being additional. The subsidy per job created or retained is
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7 then €1,731. This compares to an estimated subsidy per job of €1,515 under the DTI initiative
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9 in the U.K., €4,000 under the European business incubators initiative and € 3,100 under the
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11 Structural Fund initiative in Belgium (HARRISON AND MASON, 1996b; EUROPEAN
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13 COMMISSION, 2002).
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20 The Flemish government thus succeeds in stimulating economic development and growth
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22 through the subsidization of BANs. BAN-backed companies generally contribute as much as
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24 companies that found BA financing without a BAN and significantly more than non-BA-
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26 backed companies in terms of value-added and job creation, although they do initially pay
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28 less taxes.
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31 32 33 34 INDIRECT EFFECTS 35

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39 An exhaustive evaluation of a government initiative needs to go beyond its direct effects
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41 (HARRISON and MASON, 1996b; LERNER, 1999). In addition to matching entrepreneurs
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43 and investors, BANs may provide other benefits, such as raising the awareness and legitimacy
44
45 of BA financing, coaching and educating investors and entrepreneurs (which for the latter also
46
47 entails feedback from potential investors) and enabling entrepreneurs to raise further
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49 financing thanks to BA financing, both at the time of the initial investment and later
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51 (HARRISON and MASON, 1996a;b; LUMME *et al.*, 1998). Although hard to quantify, we
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53 briefly discuss each of these impacts.
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3 Due to the anonymity preference of BAs and the fact that entrepreneurs often have
4 incomplete knowledge of financing sources (VAN AUKEN, 2001; PAUL *et al.*, 2003),
5 raising the awareness of potential market participants is an important task of BANs.
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7 Interviewed entrepreneurs and BAs agree that BANs have conducted a considerable
8 awareness campaign on the existence and merits of BA financing. Furthermore, both parties
9 considered this task to be important.
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20 Additionally, BANs can coach entrepreneurs on writing a business plan or presenting
21 themselves to potential investors. If BAs are not the most appropriate funding source, BANs
22 can refer entrepreneurs to other, more suitable investors. The feedback provided by the BAs
23 themselves may also be important. Even if entrepreneurs do not find an investor, they might
24 strengthen their opportunity based on feedback received from the BAs they talked to.
25
26 Education and training is a related task. BANs often provide specialized courses to investors
27 and entrepreneurs on issues as negotiation, taxation or valuation. Based on our interviews, we
28 found that entrepreneurs praise the BANs for their education and coaching. Although BAs
29 consider the BANs to perform rather well in educating entrepreneurs, they suggest more
30 emphasis on educating BAs although they do not consider this to be a critical task.
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46 A final indirect effect is the fact that BA funding might enable entrepreneurs to raise
47 additional financing, both at the time of BA financing and thereafter (HARRISON and
48 MASON, 1996b). Cumming (2007) interprets the ability of companies to raise follow-on
49 funding even as an indirect indication of entrepreneurial success, especially if they have not
50 come to full fruition. Ten BAN-backed companies raised on average €243,518 from BAs not
51 connected to a BAN and €233,313 from other sources at the time of the BA investment. More
52 particularly, four raised money from a bank, four from the government (subsidies), one from
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3 3Fs, one from VCs and one from other companies. In comparison, companies benefiting from
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5 the DTI initiative raised €298,516 at the time of BA funding (HARRISON and MASON,
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7 1996b). While Flemish BAN-backed companies raised somewhat less than their UK
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9 colleagues, this confirms the satisfactory performance of the Flemish companies.
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15 Further, 61% of the entrepreneurs state that the BA financing had a positive impact on
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17 follow-on financing. Fourteen companies were able to raise follow-on bank financing, two
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19 VC financing and four raised financing through other channels such as government subsidies.
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21 On average, they raised another €365,000 following BA financing. According to Harrison and
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23 Mason (1996b), one quarter of the companies should be able to attract at least 50% of the
24
25 original amount as follow-on financing. The Flemish BAN-backed companies performed well
26
27 as one quarter of the BAN-backed companies were able to raise 168% of the original amount.
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29 This yields further positive evidence of potential future value creation (CUMMING, 2007).
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31 These results suggest that the Flemish BANs, in addition to their direct effects, also generate
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33 important positive indirect effects.
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41 CONCLUSION AND DISCUSSION

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46 Designing a successful programme that addresses failures in the risk capital market
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48 without crowding out the private sector is not easy. International evidence shows that
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50 countries as Israel, Australia and the US have implemented successful programmes
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52 supporting the VC market (CUMMING, 2007). The goal of the present study is to evaluate
53
54 whether one type of government intervention in the informal risk capital market, namely the
55
56 subsidization of BANs, is warranted. We first assessed whether the subsidies have reached
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58 their goals of reducing the financing problems of value-creating entrepreneurial companies
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3 and, by doing so, stimulating economic development and growth. Second, we assessed
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5 whether this intervention was based on correct assumptions. Government intervention in the
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7 risk capital market is usually based on the perception of a market failure. Therefore, we
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9 evaluated whether there is a failure in the BA market, i.e. whether there are value-creating
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11 companies that face financing problems caused by information problems or R&D spillovers.
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13 We further assessed some indirect effects.
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20 Based on quantitative and qualitative data, we find clear evidence of BANs reducing
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22 information and financing problems of entrepreneurial companies. BANs finance particularly
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24 young companies with high financial risk in high-tech industries. These companies are most
25
26 prone to information asymmetries and financial constraints. Moreover, entrepreneurs and BAs
27
28 state that they would not have known each other without BANs. The programme is additive: it
29
30 increases the supply of funds to entrepreneurial companies, rather than crowding out the
31
32 private sector. Further, these companies do contribute to economic development and growth.
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34 In this sense, the Flemish government programme is a success as its goals are reached. At this
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36 point in time it is hard to assess whether the supported companies create value in the long
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38 term. In the short term, they seem to destroy value, but there is an upward trend in value
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40 adding and profitability in the last years of the analysis, what might point to these companies
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42 just needing more time to deploy their resources in the most effective way. The fact that most
43
44 companies are able to raise significant amounts of follow-on funding is a further indication of
45
46 future potential. The Flemish BAN programme produced positive indirect effects and
47
48 compares well to the UK's DTI initiative, our only benchmark (HARRISON and MASON,
49
50 1996b). In conclusion, the fact that this programme has successfully reached its goals, created
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52 many positive indirect effects and that the companies supported through this programme hold
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54 value-creating potential, lead us to conclude that public BAN support is justified. However, in
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3 order to make this tentative conclusion more robust, a longer-term evaluation of BAN-backed
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5 companies' value creation is indispensable.
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10 Our study has several contributions. First, we contribute to the academic evaluation
11 literature, as there is a scarcity of government programmes' evaluations. We contribute
12 methodologically by combining quantitative and qualitative data. Second, our study dispels
13 the popular view that BANs attract the worst-quality deals. Companies that seek funding
14 through BANs are not riskier, nor do they grow less or have lower returns post-investment
15 compared to companies that seek funding from BAs through another channel. Finally, it
16 confirms the BANs' role in reducing information and financing problems in the informal risk
17 capital market.
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31 Our study has a number of limitations. First, we mainly focused on the subsidies' direct
32 effects. As the externalities of the subsidies are hard to quantify, the impact of the government
33 subsidies might be underestimated. Second, some positive outcomes, such as total BA money
34 invested due to the existence of a BAN, might be over-estimated. Third, one could argue that
35 publicly funded BANs should be compared with non-publicly funded ones. As the ultimate
36 goal of BAN subsidies is to reduce information and financing problems of entrepreneurial
37 companies, we consider it more relevant to study the ultimate beneficiaries of the measure.
38 Moreover, none of the Flemish BANs would have existed without the subsidies: they were
39 instrumental in setting up and running the BANs. There were (and still are) no Belgian BANs
40 operating without subsidies (EBAN, 2005a).
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57 We propose some suggestions for further research. As most BAN investments are young,
58 we were only able to assess their post-investment performance up to four years. In order to
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3 assess the value creation of BAN-backed companies longer-term analyses are essential.
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5 Another interesting avenue for further research is to compare companies that had financing
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7 alternatives prior to BA investment with those without. In order to further understand the
8
9 impact of direct BAN subsidies, it is interesting to compare this approach with other
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11 approaches used to stimulate BA investments, e.g. tax reliefs or co-investment schemes.
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13 Given the relatively young nature of the latter programmes, we leave this as an avenue for
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15 future research.
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26
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32
33 Community” for assistance in the data collection.
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38 NOTES

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43 1: This might be over-estimated as we could only exclude double counting for BAs that made
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45 BAN investments.
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48 2: There is no significant difference in BAN-backed and non-BA-backed companies’ leverage
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50 up to two years after BA participation, which supports this assumption. This does not hold for
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52 the BA-backed companies that did not resort to a BAN. Comparisons with the latter thus need
53
54 to be cautiously interpreted.
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57 3: As for representativeness tests, age and assets of the different subsamples of BAN-backed
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59 companies are not significantly different from the population of 55 BAN-backed companies.
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3 As we have no data on the 20 BAs who did not participate in the study, we don't know
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5 whether the interviewed BAs are representative for the BAs who have invested through one of
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7 the BANs.
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10 4: These amounts are lower limits since not all BAs were willing to provide this information.

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12 5: This differs from the €20.83 mentioned before since there is no perfect overlap between the
13
14 interviewed BAs' investments and the interviewed companies.
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17 6: BAN-backed companies have significantly lower value-added ratios compared to non-BA-
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19 backed companies until year 2, but the difference is not significant thereafter.
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22 7: We thank an anonymous referee for this comment.
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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) %	-33.22	46.55	21	1.05***	24.72	24	-15.26**	85.25	21
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	-38.53	51.34	26	11.76***	19.87	29	-23.23	39.21	26
ROA – Year 2	-38.53	72.12	28	12.34***	19.11	32	-32.71	69.85	45
ROA – Year 3	-42.38	134.23	23	11.09**	21.73	26	-26.36	50.63	43
ROA – Year 4	6.97	95.85	14	5.44	10.31	19	-27.32	72.15	40

*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	3.82	7.51	11	22.09**	65.51	22	20.00	31.89	12
Year 2	0.63	5.80	8	21.28**	41.46	25	12.42	24.14	19
Year 3	9.67	25.24	12	17.36	24.03	25	28.83**	49.35	18
Average yearly growth									
Value-added	73.78	144.41	30	-3.55**	146.54	33	148.00	415.24	46
Employees (FTE)	0.52	1.57	21	-0.18**	1.82	16	2.74	8.60	44

*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