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On the Usefulness of Tax Incentives
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An Empirical Analysis [*]

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Résumé / *Abstract*

De nombreux gouvernements ont instauré des programmes fiscaux destinés à promouvoir le financement des petites et moyennes entreprises. Il existe toutefois très peu d'études de l'efficacité de ces initiatives. Nous analysons le programme de Société de placements dans l'entreprise québécoise (SPEQ), instauré au Québec pour améliorer la capitalisation des petites et moyennes entreprises. Les actionnaires de sociétés de portefeuille obtiennent d'importants crédits d'impôt lorsque ces sociétés financent des entreprises admissibles. Nous analysons en premier lieu le programme à la lumière des principes de base du financement des entreprises : l'asymétrie informationnelle, les problèmes d'anti-sélection et d'agence et la réticence à partager le contrôle. Comme le programme ne tient aucun compte de ces diverses dimensions, nous posons l'hypothèse qu'il ne permettra pas l'atteinte de l'objectif premier, qui était d'attirer des investisseurs providentiels dans l'actionnariat des entreprises. Nous supposons également que le programme devrait attirer principalement des entreprises de qualité médiocre, dont la performance après le placement sera faible. L'analyse de l'ensemble des SPEQ agréées entre 1998 et 2003 et des 83 sociétés financées pour lesquelles des données comptables sont accessibles permet de confirmer chacune de ces hypothèses. Le programme n'atteint pas ses objectifs et ne peut pas être considéré comme un succès. L'étude met en évidence l'importance de dessiner très soigneusement les programmes d'aide au financement des petites entreprises.

Mots-clés : politiques publiques, financement des petites entreprises, incitatifs fiscaux, investisseurs providentiels

Several governments have designed tax incentive programs to promote small business finance, yet evidence of their efficiency is very scarce. This article analyzes the QBIC program, introduced in Quebec to help capitalize SME. Individual investors in holding companies that finance one or more small corporations receive substantial tax credits. First, the functioning of the program is analyzed in light of the fundamentals of the small business finance paradigm, in particular the adverse selection, agency cost and control aversion problems. Because the program design does not consider these dimensions, it putatively cannot fulfill its primary objective of attracting angels. Rather, it should mainly serve mediocre quality firms, whose subsequent performance should be weak. We analyze the ownership of all the QBICs accredited between 1998 and 2003, and the operating performance of the 83 financed companies for which accounting data were available. Our tests confirm each of our hypotheses. The program can hardly be considered as a success. In terms of public policy, the study concludes that poorly designed programs cannot attain the objective of promoting small business capitalization.

Keywords: *public policy, small business finance, tax incentives, business angels*

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INTRODUCTION

Many countries have introduced tax measures to facilitate financing of closed companies by venture capital. In certain cases, tax credits are granted to investment funds that have particular missions. The Venture Capital Trusts (2003) and the Regional Venture Capital Funds (Mason 2003) in the UK, the European Seed Capital Fund Scheme (Murray 1998) and the Canadian Labour-Sponsored Venture Capital Funds (Cumming and Macintosh 2003; Ayayi 2004) illustrate this approach. Other programs have granted tax relief to private investors and business angels that finance or advise start-ups to encourage the channeling of capital to closed companies. These two types of actions exemplify the view of taxation as a major determinant of the supply of venture capital (Christofidis and Debande 2001).[2] Nonetheless, very few studies have examined the efficiency of these programs with respect to public policy. As the OECD (2002) noted, "it is not clear that the goals of encouraging small firms and intangible investment justify these deviations from neutrality in the tax system, that fiscal measures are the best choice of policy instrument for achieving these aims nor that current tax measures are effective in their use and design." More specifically, there are apparently no rigorous studies of programs intended to stimulate direct investment in closed companies. To our knowledge, the only pertinent analysis is a consultants' report (Boyns, Cox et al. 2003) that asserts that, in the United Kingdom, the Enterprise Investment Scheme (EIS) is cost effective. The authors argue that its estimated cost in terms of tax foregone has been 55-66 pence for every £ 1 invested through it[3] and that EIS had a positive impact on companies' growth and on a range of performance indicators. However, they underline that without external benchmarks, it is difficult to say how good a performance this represents. Riding and Dunlop (2002, p. 8) note that "policy makers are pressured to develop means of increasing the availability of private investment. Suggestions include: revision of the tax treatment of equity investment and capital gains and losses; reform of securities regulations (…). Research is needed to identify whether, or if, such measures are

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[2] Other countries have adopted non-fiscal intervention modes. In the United States, Lerner (1998) maintains that the most visible effort to encourage individual investors in SME has been the Angel Capital Network (ACE-Net). This Internet Forum allows small business to post business plans and communicate with accredited investors. The Canadian Angels Investment Network has similar objectives.
[3] Nonetheless, the authors found that the proportion of funds giving rise to the deduction that would have been invested without the program is between 52% and 87%. The cost per adjusted monetary unit (compared with the scenario where the program does not exist) is thus between 1.15 (0.55 /(1-0.52)) and 5.08 (0.66 / (1-0.87)). It is therefore uncertain whether the program is indeed cost effective.

warranted." In the same vein, Lerner (1998, p. 79) contends that "there is still a considerable degree of uncertainty about the need of public efforts to encourage investments in young firms by individual investors." Further, Lerner (2002) affirmed that very few works have examined the way in which financing programs must be structured to ensure their effectiveness.

To answer these questions, the fiscal aid program for direct investment in closed companies put in place in Quebec, known as The Quebec Business Investment Company (QBIC) program, is analyzed in-depth. According to (Investissement Québec 2002), "QBICs arose from the work of the Commission québécoise sur la capitalisation des entreprises, which, in the mid-1980s, examined the problem of under-capitalization of Canadian SMEs, particularly in Quebec. The solution adopted was to offer Quebec investors a tax benefit when they invest in Quebec SMBs. (…). The main objectives of the program are as follows: 1) To help improve the capitalization of Quebec SMBs; 2) To facilitate the growth of existing companies or the start-up of new ones; and 3) To encourage SMB owners to take on new partners." The main target of the program is thus to improve capitalization by soliciting the participation of business angels.

This program and its characteristics are described in the first section below. In the second section, the provisions of the program are analyzed in light of the theoretical concepts associated with financing of closed companies, and hypotheses are formulated regarding the results of this program. These hypotheses are tested in the third part, using an original database composed of all the QBICs accredited between 1998 and 2003 and of 83 financed companies for which accounting data were available. The final section presents conclusions.

1. THE QBIC PROGRAM

Functioning

The program consists in the creation of a QBIC, a private company whose sole activity is to make minority investments in qualified corporations (QC). The capitalization must exceed $50,000[4] in the form of common shares with full voting rights. The QBIC must remain a minority shareholder in each QC and maintain the investment in each QC for 24 months. The QBIC is therefore an intermediate structure between investors and a QC. A shareholder

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[4] All amounts are in Canadian dollars unless specified otherwise.

controlling a QC may invest in the QC through a QBIC, if the shareholder holds less than 50% of the voting rights of the QBIC. One or more minority shareholders of a QC can control the QBIC, if the shares they hold, directly or indirectly, in the company represent less than 50% of the voting rights of the QC. It is therefore possible for two or three shareholders of a QC to control a QBIC.

To qualify for investment by a QBIC, a corporation must be a Canadian-controlled private corporation, whose head office is in Quebec and most of whose activities take place in that province, and whose assets are less than $50 million. It must not have made significant disbursements of funds to shareholders or investors in the past 24 months. The program is supervised, administered and controlled by Investissement Quebec (IQ), a provincial crown corporation. This body certifies and records the QBIC at its inception, and authorizes each of its investments. It monitors the QBIC for five years after its last investment.

Tax incentives

Investors receive a deduction applicable to their provincial taxes of up to 150% of their holding in qualifying investments made by a QBIC. In addition, investments made by a QBIC may give rise to an additional deduction as a registered retirement savings plan (RRSP), valid at the provincial and federal levels. According to IQ, the real cost of a QBIC investment of $100 is only $15.78 for the most highly taxed investor, when the RRSP is used. The tax credit represents 84.22% of the investment value (77% for a taxpayer whose income is between $55,000 and $65,000). These percentages apply when all of the funds gathered by the QBIC are invested in QCs.

QBIC and the Securities Act

The objective of the program is to increase capitalization and attract new shareholders. The securities regulation stipulates a registration and prospectus exemption for companies with a maximum of 25 shareholders when the securities are distributed only to 1) persons that can evaluate the prospective investment by virtue of their financial experience or of advice received from a registered person other than the promoter, 2) senior executives of the issuer or of an affiliated company and 3) persons associated with such executives. A supplementary exemption,

known as the Tax-shelter securities exemption, allows the company to increase the maximum number of shareholders to 50 (R.S.Q., Chapter V-1.1, sections 47 and 48).

Two types of QBICs ensue from the provisions of the Securities Act. Closed QBICs sell their shares only to shareholders with close ties to management and to a limited number of sophisticated shareholders, whereas Public QBICs undertake an initial public offering via a prospectus and become reporting issuers. For the entire period, the proportion of public QBICs is approximately 10% to 15%. In the years 1998 to 2002, the proportion was 15%. These entities are analyzed separately.

Overview

By late 2003, 664 QBICs were completed since the start of the program, for a total of $292 million in investments. 259 QBICs are still active, that is still being monitored by IQ. The average investments per QC increased sharply until 2000, corresponding to $182,000 in 1997, $302,000 the following year, $383,000 in 1999 and $427,000 in 2000, which reflects the use of the program by relatively large technology firms that raised several millions of dollars as the technological bubble inflated. In 2001, average investments were $214,000, compared with $148,000 in 2002. Given the data available, our analysis was limited to the most recent years.

Although the QCs are closed companies, accounting and financial data was obtained from IQ for the investments authorized between April 1998 and March 2003.[5] The gross sample includes 208 QBICs and 205 different QCs.[6] Investments in QC total $85.7 million. Since 1997, 20 financing packages were undertaken through initial public offerings involving a prospectus, and 8 through offering memoranda. More than 85% of QBICs therefore relied uniquely on private placements (Table 1). QBICs predominantly finance companies in manufacturing (53% of QC and 29% of investments), high technology (29% and 55%) and services (18% and 16%).

Certain key data were not available systematically, and it was impossible to study changes in share ownership. In 122 cases, the financial statements of the QC were not available for the following reasons: bankruptcy or rapid liquidation of the QC (45 cases), mergers or acquisitions

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[5] The program was suspended for evaluation in June 2003.
[6] The number of QBICs differs from that of QCs because 12 QCs are financed by more than one QBIC and 6 QBICs finance more than one company.

(10), deliberate non-transmission (QC still active in 2003, 67 cases). A systematic analysis was conducted via the Internet, Lexis-Nexis and the Quebec Enterprise Register Computer Centre.

Table 1 shows that the 83 QCs analyzed predominantly consist of very small businesses. Their mean (median) sales for the period are $2.369 million ($1.022 million). Their mean (median) shareholders' equity between 1998 and 2003 are $1.279 million ($0.495 million). At the accreditation date (before the investment), the mean (median) shareholders' equity of the QC in the final sample is $1.357 million ($0.475 million), and 75% of the companies have shareholders' equity of $1.143 million or less. The median investment represents roughly 40% of the median capitalization before the investment (0.188/0.475).

The 48 cases of bankruptcy or liquidation[7] represent 23.5% of the sample of QCs. Given that the program generates an injection of equity that reduces the financial risk, this percentage is relatively high. The comparison in Table 1 of the initial sample and the final sample shows that the omission of companies for which data are missing does not modify the characteristics of the sample examined. The average investment per corporation and by investor are comparable.

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[7] Three cases of bankruptcy and liquidation were observed in the final sample of QCs.

Table 1: General characteristics of the initial and final sample of qualified corporations financed by the QBIC program between 1998 and 2003. PP means that the issue is a private placement; OM means that the issue uses an offering memorandum; PR means that the issue uses a prospectus. Mean Sales (Median sales) is the average (median) of the arithmetic mean revenues calculated for each corporation between the accreditation date and the end of the study period. Mean SE (Median SE) is the average (Median) of the arithmetic mean shareholders' equity calculated for each corporation between the accreditation date and the end of the study period. All amounts are in Canadian $.

Type of issue	Initial Sample				Final Sample			
	PP	OM	PR	Total	PP	OM	PR	Total
Number of qualified corporations	177	8	20	205	70	3	10	83
Total investment, in $K	41,226	4,922	39,525	85,673	17,971	1,207	24,577	43,755
Mean investment, in $K	233	616	1,976	418	257	402	2,458	527
Median investment, in $K	150	423	1,659	180	145	331	1,937	188
Number of investors involved	4,871	359	8,520	13,752	2,871	140	4,317	7,328
Mean invested amount, in $K	8.46	13.71	4.64	6.23	6.26	8.62	5.69	5.97
Mean Sales, in $K	-	-	-	-	2,158	7,808	2,217	2,369
Median Sales, in $K	-	-	-	-	1,032	128	678	1,022
Mean SE, in $K	-	-	-	-	897	2,476	3,591	1,279
Median SE, in $K	-	-	-	-	393	697	1,208	495

2. Conceptual analysis of program

The financing of small firms is characterized by highly asymmetric information, and, according to Berger and Udell (1998), by informational opacity. This situation induces moral hazards and adverse selection problems, which can be addressed by specialized intermediaries such as venture organizations (Gompers and Lerner, 2000, p.130). The ability to attenuate information problems and enhance ex-post monitoring is not specific to venture capitalists, but seems to span the spectrum of private equity investors, as Folta and Janney (2004) note. These capacities are instrumental to the success of a financing tool. Moreover, it is also worth asking whether the program is designed in such a way to obviate the well known reluctance of small business managers to share control (Cressy and Olofson 1997). In the next section, we analyze the features of the program in light of the fundamentals of the small business finance paradigm. Several hypotheses ensue.

The control aversion problem

Small business owners are generally reluctant to surrender ownership and control. Gibb (2000) contends that "there is more evidence that the SME owner-manager (…) does not like in general to give away part of the company and is therefore not open to venture funding."[8] The program design enables existing shareholders to also play a significant role in the ownership of the QBICs. Accordingly, they can obtain a large portion of the tax credits without effectively sharing control of the company.[9] For companies of average or good quality, it is optimal for QC shareholders to withdraw funds from the company and reinject them through a QBIC. The funds are thus disbursed by the QC (in the form of high salaries, dividends or repayment of personal loans), and are subsequently reinvested. To meet the requirements of the program, QC owners need simply to sell a minority share to friends or relatives. In this case, the program has no significant effects on capitalization and ownership, and the objective of attracting business angels will not be attained. The first hypothesis is therefore:

H1 *The program should not attract business angels, and will be used mainly by current shareholders and relatives.*

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[8] For a review of the control aversion problem, see Berggren et al (2000) and Cressy (2002).
[9] The program prohibits a majority shareholder of the operating company from controlling the QBIC. However, two majority owners of the QC can control the QBIC, as well as the sole owner of the QC, his wife and their children.

Adverse section, lemons and screening

Because managers are better informed than external investors of the real value of projects, they will submit projects of lesser quality (lemons) for external financing, and attempt to finance the most profitable projects themselves (Mason and Harrison 2002; Brau, Brown et al. 2004). Two key means of obviating the lemon problem are signaling and screening

Informational asymmetry can be reduced by signals. The proportion of new issues acquired by former shareholders is an important signal to external investors of the quality of the project financed. Nonetheless, to be credible a signal must be costly. Given that 80% of the shareholders' disbursements are subsidized under the QBIC program, they cease to represent a costly and thus credible signal. Under the QBIC program, it is consequently impossible for managers to issue credible signals through which investors can assess quality.

When authorizing the creation of QBICs, IQ does not apply any selection criteria and verifies only the likelihood of the company's survival. It therefore does not play a role in investment certification or screening. Few real angels are likely to finance QBICs, in keeping with the first hypothesis. Nonetheless, the tax benefits may attract ill-informed or unskilled investors. Fenn et al. (1996) posit that individual investors lack the skill to correctly appreciate the value of a private venture. The program therefore encourages the supply of projects with low profitability to investors that are often ill-equipped to analyze them correctly, and provides investors with very few means of selecting the most promising projects. The information transmitted to investors during private placements is very limited, a problem compounded by the lack of a prospectus. Consequently, a very low average quality of QC at the accreditation date should be observed. The second hypothesis therefore states that:

H2 *The quality of firms attracted by the QBIC program should be low.*

Monitoring and performance

The operational performance of QCs should be weak for four reasons: 1) the poor quality of firms that use this program, as explained above; 2) the lack of correctly designed incentive contracts that align the interests of managers and shareholders; 3) the absence of essential services provided by venture capitalists or angels and 4) the lack of real incentives for

shareholders to monitor the operating company. When external shareholders are solicited, the managers' incentive to act in their own interest increases, which generates additional agency costs. These problems have been studied extensively and are well documented (Berger and Udell 1998; Lerner 1998; Brierley 2001; Denis 2003). The success of a financing mechanism for small businesses is therefore contingent on the capacity of the program to address these problems. Consequently, specialized investors such as venture capital corporations have developed project screening and monitoring skills that rest on expertise, methods and tools, and, concerning monitoring, the development of optimal contracts. These contracts are intended to align the interests of external shareholders and managers. Entrepreneurial financing contracts stipulate cash flow rights, voting control and decision rights, while provisions of the shareholder agreement enable external investors to take control of the company should the executives exhibit suboptimal behavior (Gompers and Lerner 2001). These contracts are highly state-contingent and effectively shift a substantial amount of the risk in a new venture from the investor to the entrepreneurs. In the United States, these contracts primarily integrate convertible shares, whereas investors in other countries tend to use a greater variety of instruments to minimize the costs arising from a set of agency problems (Cumming 2004).

Nonetheless, the provisions of the QBIC program prohibit these tools, because only common shares are permitted when the QBIC must remain under the control of minority shareholders. Venture capitalists and angels putatively advise and support companies to further their development. As few genuine angels and no institutional investors should participate in the program, these complementary elements should be lacking. Lastly, agency theory specifies that external investors undertake monitoring activities until the margin cost of these activities equals the marginal return, measured by the growth in value of the shares held. If investors place on average a gross amount of $6000 to $8000, over 80% of which can be subsidized by tax credits, their real incentive to exercise effective control is highly limited.[10] The third hypothesis therefore predicts that:

H3 *The operational performance following the investment should be weak.*

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[10] This principle can be illustrated as follows: if an investor requires a return of 5% on his investment and invests $100 in a QBIC, under the maximum deduction rate, the investor has effectively invested $16 after taxes. To attain the return objective, this amount must be worth $26 after 10 years. The $100 effectively placed can therefore lose 12.6% of its value annually without affecting the investor.

3. EVALUATION OF THE PROGRAM

Methodology

The first hypothesis is validated by a detailed analysis of ownership of QBICs and the associated QCs. To determine whether the program attracts quality companies, and to qualify their subsequent performance, we used the conventional indicators of financial performance, namely the return on equity (ROE) obtained by dividing net earnings by total equity. The net margin (NM) is calculated by dividing net earnings by sales. We also calculated the growth rate of sales, but this important indicator cannot be estimated for several companies that report no sales at the inception date. Moreover, the growth rate of equity was estimated, as the increase in capitalization is the main objective of the program. To assess the relative performance of the QCs, the Financial Performance Indicators for Canadian Business (FPICB), published by Statistics Canada is retained as a benchmark. FPICB provides median annual ROE ratios and median NM ratios for each industry, for small and medium-sized firms with annual revenues between \$30,000 and \$25 million.

Quality of corporations

The operating performance of the QCs is calculated as follows. For each firm and each year the excess ROE, i.e. the difference between the observed ROE and the ROE of the corresponding industry, the corresponding year and that of similar sized firms, is calculated. For each year t and each company i, excess return on equity, $ROEX_{i,t}$, is calculated, expressed as:

$ROEX_{i,t} = ROE_{i,t} - IROE_{i,t}$

Where $ROE_{i,t} = NI_{i,t} / SE_{i,t}$

$NI_{i,t}$ is the net income before extraordinary items of company i for year t

$SE_{i,t}$ is the shareholders' equity of the year t

$IROE_{i,t}$ is the ROE of the industry of the firm i of the year t .

$ROEX_{i,t}$ is 100% (-100%) when $ROEX_i$ exceeds 100% (is less than -100%).

For each firm and each year, we also calculate an excess net margin, i.e. the difference between the observed net margin (NM) and the NM of the corresponding industry, the corresponding year

and that of similar sized firms. For each year t and each company i, we calculate an excess net margin, $NME_{i,t}$, expressed as:

$NMX_{i,t} = NM_{i,t} - INM_{i,t}$

Where $NM_{i,t} = NI_{i,t} / Sales_{i,t}$

$NI_{i,t}$ is the net income before extraordinary items of company i for year t

$Sales_{i,t}$ is the revenues of company i for year t

$INM_{i,t}$ is the net margin of the industry of the firm i of the year t .

$NMX_{i,t}$ is 100% (-100%) when NMX_i exceeds 100% (is less than -100%).

To assess the quality of the firm, we examine the excess return on equity and the excess net margin for the year t = 1, which corresponds to the financial statements at the accreditation date, i.e. prior to the investment of the QBIC.

Subsequent performance

To assess the operating performance of the firms following the investment, we examine the average excess return on equity and the average excess net margin between the year t = 2 and the end of the study period. The average excess return on equity ($ROEX_i$) and an average excess net margin (NMX_i) for each company i, are then defined as:

$$ROEX_i = \frac{\sum_{t=2}^{n} ROEX_{i,t}}{(n-1)}$$

$$\text{And } NMX_i = \frac{\sum_{t=2}^{n} NMX_{i,t}}{(n-1)}$$

Where n is the number of years between the accreditation date and the end of the study period.

The control aversion hypothesis

The first significant observation is that this program does not attract business angels as the term is generally construed. Denis (2003) contends that business angels place small amounts, which range from US$500,000 to US$1 million. In Canada, the amounts invested represent on average more than $100,000 (Farrell 2000). Given that the average investment in QBICs is between $6,000 and $8,000, these investments cannot be considered financing from business angels.

Only the few QBICs that attained the status of reporting issuer were qualified to admit a significant number of new shareholders. These cases are largely associated with the technology stock bubble. Whereas 80 QBICs undertook an initial public offering between 1990 and 2002, 30 did so between 1998 and 2002, and most placements involving a prospectus occurred during the years 1998 to 1999.

To quantify this phenomenon, we carefully scanned the records of the Quebec Enterprise Register Computer Centre,[11] for the whole sample of QCs and QBICs. Table 2 reports our main findings. We observe that, in 47% of the cases, QBICs are controlled by QC shareholders or relatives of QC shareholders, in violation of the objectives of the program. We indicate significant involvement of QC shareholders, which in some cases held all of the shares of the QBICs.[12] Indeed, Table 3 shows that nearly 40% of QBIC shareholders are also QC shareholders, or have close ties to QC shareholders. The supervisory authority confirmed that "QBIC shareholders are generally friends, business partners (…)"[13]. These observations are consistent with the control aversion hypothesis.

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[11] The Registraire des entreprises is a government organization. Its mission is to help protect the economic and social relations of enterprises, associations and the public. Accordingly, it maintains a public register, the Québec Enterprise Register Computer Centre. It processes, stores and distributes key identification data on associations and enterprises incorporated or operating in Québec. This information has legal force. The mandatory annual form required by the registraire lists the related persons, defined as shareholder, director, chief executive officer, etc.

[12] This situation is consistent with the rules of the program. When three or more shareholders hold all of the shares of the QC, they qualify to jointly hold all of the shares of the QBIC.

[13] Source: "*Partie 1: État de la situation*", Internal document, Investissement Quebec, 8 pages. Consequently, this program surely attracts a share of *love money* that the QC would have received regardless of whether a QBIC existed.

Table 2: Characteristics of QBIC investors and their relationship with QC shareholders

Number of QBICs and QCs	218
Number of QBIC shareholders	839
Number of QC shareholders (excluding QBICs)	921
Number of QBIC shareholders that are QC shareholders	264
Number of QBIC shareholders with ties* to QC shareholders	62
Number of QBICs controlled** by QC shareholders or relatives of QC shareholders	103
Percentage of QBIC shareholders that are QC shareholders or have ties to QC shareholders, in %	38.86
Percentage of QBICs controlled by QC shareholders or relatives of QC shareholders, in %	47.25

* A QBIC shareholder is tied to (is a relative of) a QC shareholder if their surnames or their addresses are similar. We do not capture linked shareholders with different surnames.
** A QC shareholder (or relative of a QC shareholder) controls the QBIC if he is the majority shareholder or the first shareholder of the QBIC.

Source: Investissement Québec and Québec Enterprise Register Computer Centre

Lemon problem and screening

Table 3 illustrates the quality of companies financed, measured during the fiscal year preceding the first placement of the QBIC. ROE and net excess margins ($ROEX_{i,1}$ and $NMX_{i,1}$ respectively) are calculated for each of the cohorts and by type of issue. Overall, QCs exhibit very low profitability. The return on equity (net margin) of these companies is significantly less than the return (at the net margin) of companies of the same size and sector. The standard deviation between the average ROE of RC and that of companies of the same size and sector is 3,720 basis points (bp).[14] The corresponding deviation related to net margin is 3,449 bp. In both cases, the differences are statistically significant at 1/1000. Although ROE and margins are incomplete measures of firm quality, the companies that have used the program are arguably less efficient than comparable companies as a whole. It is therefore unlikely that they would be able to attract capital without this program.

The fact that these companies are reporting issuers or high tech companies does not change this finding. Regardless of whether they operate in technological sectors, QCs financed by reporting QBICs accrue considerable losses, sometimes exceeding their assets, for the two cohorts prior to the burst of the technological bubble. The very low profitability cannot be associated with R&D expenditures or the listing of companies at a pre-commercialization stage.

QCs therefore comprise poor quality companies, which supports H2. The mediocre quality of financed companies reinforces the argument put forth by Mason and Harrison (2002) that projects proposed to private investors are generally of poor quality, owing to the relative scarcity of good projects. It also supports the theory of adverse selection whereby owing to informational asymmetry, only the worst projects are proposed to external investors. The poor quality of the projects is not inconsistent with the fact that insiders procure the major part of the financing. Whereas the net cost is only a fraction of the total investment, QBIC shareholders can obtain positive net returns on poor quality firms.

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[14] According to the Bank of Canada, 100 basis points equal one per cent and 25 basis points one-quarter of one per cent. For example, if the target for the overnight rate is raised from 2 3/4 per cent to 3 per cent, it has been increased by 25 basis points.

Table 3 Average excess returns on equity (ROEXi,1) and average excess net margins (NMXi,1) at the accreditation date of qualified corporations financed by the QBIC program between 1998 and 2003. Panel A (Panel B) presents the $ROEX_{i,1}$ ($INMX_{i,1}$) for the entire sample. Panel C (Panel D) presents the results corresponding to the $ROEX_{i,1}$ ($NMX_{i,1}$) for the sample restricted to high technology companies. Panel E (Panel F) presents the $ROEX_{i,1}$ ($NMX_{i,1}$) for the sample restricted to non-high technology companies. RI sample (RNI sample) is the sample restricted to the reporting issuers (non-reporting issuers).

	Complete sample	RI sample	Non-RI sample
Panel A: $ROEX_{i,1}$ complete sample			
Number (available data)	83 (73)	13 (13)	70 (60)
Mean in %	-37.20	-39.71	-36.66
Median in %	-33.15	-38.71	-32.90
Standard deviation in %	44.72	32.87	47.11
Student's t test	-7.11	-4.36	-6.03
P value	<0.0001	0.0009	<0.0001
Panel B: $NMX_{i,1}$ complete sample			
Number (available data)	83 (73)	13 (13)	70 (60)
Mean in %	-34.49	-55.89	-29.86
Median in %	-9.36	-67.50	-7.65
Standard deviation in %	43.42	47.28	41.52
Student's t Test	-6.79	-4.26	-5.57
P value	<0.0001	0.0011	0.0001
Panel C: $ROEX_{i,1}$ HT sample			
Number (available data)	28 (28)	10 (10)	18 (18)
Mean in %	-56.52	-48.32	-61.08
Median in %	-53.64	-42.17	-70.00
Standard deviation in %	36.46	32.86	38.45
Student's t test	-8.20	-4.65	-6.74
P value	<0.0001	0.0012	<0.0001
Panel D: $NMX_{i,1}$ HT sample			
Number (available data)	28 (28)	10 (10)	18 (18)
Mean in %	-60.42	-62.03	-59.52
Median in %	-100.00	-83.75	-100
Standard deviation in %	46.30	45.86	47.85
Student's t Test	-6.91	-4.28	-5.28
P value	<0.0001	0.0021	<0.0001
Panel E: $ROEX_{i,1}$ NHT			
Number (available data)	55 (45)	3 (3)	52 (42)
Mean in %	-25.17	-10.99	-26.19
Median in %	-18.42	-12.95	-22.57
Standard deviation in %	45.51	3.88	46.97
Student's t test	-3.71	-4.91	-3.62
P value	0.0006	0.0391	0.0008
Panel F: $NMX_{i,1}$ NHT			
Number (available data)	55 (45)	3 (3)	52 (42)
Mean in %	-18.36	-35.41	-17.14
Median in %	-3.76	-3.82	-3.69
Standard deviation in %	32.80	55.94	31.29
Student's t test	-3.76	-1.10	-3.55
P value	0.0005	0.3873	0.0010

Monitoring and Subsequent performance

After the investment, QCs significantly underperform the benchmark indices (Table 4). The ROE and net margin of QC are significantly below those of companies of the same size and sector. The average standard deviation is 3,368 bp for ROE and 2,906 bp for margins. Medians are largely negative, which implies that more than half of the companies post performance that is inferior to that of comparable businesses after the investment. This result indicates that companies do not have projects with positive net value added at the time of financing. Deficient management is another possibility.

The addition to the sub-sample of 45 companies that declared bankruptcy and whose indebtedness is 100% aggravates the QC profile considerably. QBIC consequently finance three types of companies. The first type survives, although their return on equity is miniscule. This segment represents 39% of the population. Approximately 23% file for bankruptcy within five years. The remainder, nearly 40%, disappears because of a merger (6%) or simply stops transmitting the required information despite systematic reminders by the supervisory authority (34%). Success stories are thus extremely rare.

Null and negative values made it difficult to calculate the growth rate of sales and equity. The mean and median sales, at the accreditation date, are $2.187 million and $0.634 million. At the end of the analysis period, these amounts are $2.688 million and $1.133 million respectively. The surviving financed companies therefore experienced moderate sales growth. Because of the very low profitability and despite additional outlays of funds in several cases, the capital of surviving companies does not increase. The mean and median assets are $1.357 million and $0.475 million before the investment, which represents on average 40% of the median assets. At the end of the analysis period, the mean assets are $1.120 million and the median assets are $0.497 million. The total losses reported by the companies under study during the period therefore equal the financing provided by the program. Accordingly, the average capitalization of QC deteriorated while indebtedness increased.[15]

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[15]The ratio of total debt to total assets (not reported) deteriorates sharply on average for each of the cohorts except that of 2001. For the oldest cohort (1998), total debt increases from 53% to 69%. In 2002, the total average debt load of QCs exceeded 70% regardless of their validation year. This debt increases by 20 points or more, since year 1, for all cohorts for which three or more years of data were obtained.

Table 4 Average excess returns on equity (ROEX$_i$) and average excess net margins (NMX$_i$) of qualified corporations financed by the QBIC program between 1998 and 2003. Panel A (Panel B) presents the ROEX$_i$ (NMXi) for the entire sample. Panel C (Panel D) presents the results corresponding to the ROEX$_i$ (NMX$_i$) for the sample restricted to high technology companies. Panel E (Panel F) presents the ROEX$_i$ (NMX$_i$) for the sample restricted to non-high technology companies. RI sample (RNI sample) is the sample restricted to the reporting issuers (non-reporting issuers).

	Complete sample	RI sample	Non-RI sample
Panel A: ROEX$_i$ complete sample			
Number	73	12	61
Mean in %	-33.68	-62.24	-28.06
Median in %	-25.46	-72.91	-20.43
Standard deviation in %	43.55	31.83	43.53
Student's t test	-6.61	-6.77	-5.03
P value	<0.0001	<0.0001	<0.0001
Panel B: NMX$_i$ complete sample			
Number	73	12	61
Mean in %	-29.06	-63.70	-22.25
Median in %	-6.03	-67.44	-4.38
Standard deviation in %	43.46	38.11	41.39
Student's t Test	-5.71	-5.79	-4.20
P value	<0.0001	0.0001	<0.0001
Panel C: ROEX$_i$ HT sample			
Number	24	10	14
Mean in %	-52.03	-66.12	-41.98
Median in %	-49.96	-73.27	-37.53
Standard deviation in %	48	28.94	56.88
Student's t test	-5.31	-7.23	-2.76
P value	<0.0001	<0.0001	0.0162
Panel D: NMX$_i$ HT sample			
Number	24	10	14
Mean in %	-44.69	-66.32	-29.24
Median in %	-50.34	-67.44	-7.79
Standard deviation in %	52.99	34.43	59.42
Student's t Test	-4.13	-6.01	-1.84
P value	0.0004	0.0002	0.0885
Panel E: ROEX$_{i,}$ NHT			
Number	49	2	47
Mean in %	-24.69	-42.86	-23.92
Median in %	-12.70	-42.86	-12.70
Standard deviation in %	38.60	52.00	38.49
Student's t test	-4.48	-1.17	-4.26
P value	<0.0001	0.4514	<0.0001
Panel F: NMX$_{i,}$ NHT			
Number	49	2	47
Mean in %	-21.41	-50.56	-20.16
Median in %	-2.43	-50.56	-2.43
Standard deviation in %	36.14	69.91	34.90
Student's t test	-4.15	-1.02	-3.96
P value	0.0001	0.4928	0.003

Discussion

Three sets of problems were observed. First, few genuine business angels participate in the financing; rather, executives of financed companies play a prominent role in QBIC share ownership. Second, the quality of the companies that benefit from the program is poor on average. Third, the performance of financed companies subsequent to the investment is significantly inferior to that of comparable companies.

The QBIC program, intended to increase capitalization and integrate external investors in share ownership, does not appear to have attained its objectives. The vast majority of QBICs are closed, which implies that the investors are mainly the executives of these companies, along with the employees and their families. 47% of the QBICs are controlled by a shareholder of the QC (or a relative of the shareholder). On average, the amounts invested by each of the shareholders of the QBIC are quite modest. It is therefore highly unlikely that many individuals have invested large amounts, which would indeed qualify them as business angels.

The vast majority of companies financed by the program are of poor quality. Their profitability is significantly below that of comparable companies at the accreditation date. They are also mostly not profitable following the investment, and their total indebtedness increased significantly during the period studied, despite the QBIC investments. Indeed, the profitability of the companies is probably overestimated, because only 40% of the initial population could be studied. The remainder filed for bankruptcy, merged or failed to transmit the information required by the program.

These results are probably attributable to the fact that the program design completely overlooks the fundamental problems inherent in SME financing. The structure of the program per se, which does not take into account the serious problems resulting from information asymmetry and precludes the tools that allow management of agency costs, thus explains the highly mediocre performance of the companies financed.

4. CONCLUSION

The attempt to promote small business capitalization through tax benefits has not delivered the anticipated results. This observation corroborates the finding of Lerner (1998) that there is no proof that incentive programs for informal investors are necessary. Specifically, the QBIC program seems to orient funds toward companies with very low profitability, most of which disappear after a few years. The program therefore contributes to poor allocation of funds in the economy. The analysis of subsequent performance shows that a lack of capital was not the fundamental predicament of the companies financed by the program. Despite receiving a significant capital inflow, the profitability of these companies did not increase, nor did their sales or even their capitalization. Nonetheless, this failure may be at least partly attributable to the program design. By offering the same benefits to both external investors and people with ties to management, this program strongly encourages shareholders of the operating company to attempt to procure a credit for the investments that they would have made regardless, even by way of funds withdrawn from within the company. The involvement of business angels is therefore limited.

The lack of selection capacity and the extremely strong tax incentives have made the program highly vulnerable to the problem of lemons. Moreover, because the tax credits offered are ample, investors have little motivation to engage in monitoring activities, essential in a universe marked by strong asymmetry. Because they invest on average very small amounts, the cost of monitoring activities is not justified. Moreover, the program prohibits the use of convertible shares, a valuable instrument for managing suboptimal conditions that result from information asymmetry.

This type of program engenders a fundamental contradiction. The tax credit should be offered uniquely to external shareholders (business angels) to offset the high risk related to information asymmetry, information costs and monitoring. Amounts invested by these external shareholders should be high enough to motivate them to exert strict control over the companies financed. However, as it is difficult to verify in practice whether investors are indeed angels, it is highly tempting to grant the credits both to shareholders in place and to people related to the new investors. In this context, the main beneficiaries of the program are the current shareholders and the principal objective of the program cannot be attained.

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