


[Home](#) > [Small Business Economics](#) > Article

Funding Gaps? Access To Bank Loans By High-Tech Start-Ups

Published: 07 October 2006

Volume 29, pages 25–46, (2007) [Cite this article](#)



[Small Business Economics](#)

[Aims and scope](#) →[Submit manuscript](#) →[Massimo G. Colombo](#) ¹ & [Luca Grilli](#)¹ **2896** Accesses  **4** Altmetric [Explore all metrics](#) →

Abstract

This paper aims to shed new light on start-up financing of new technology-based firms (NTBFs) and the existence of credit constraints that may negatively affect their activity. For this purpose, we analyze the different sources of start-up financing used by NTBFs and investigate several characteristics that may influence the extent of recourse to bank loans. In the empirical section, we consider a sample composed of 386 Italian NTBFs that operate both in manufacturing and services. We estimate double-censored tobit and bivariate tobit models so as to highlight the determinants of (i) the financial leverage, measured by the ratio of bank debt to total capital, and (ii) the amounts of personal capital and bank loans of firms at start-up, respectively. Our findings support the view that the credit market is imperfect and there exists a financing hierarchy. In fact, only a minority of firms resorts to outside financing, and especially to bank debt. In addition, the level of financial leverage is not random; it increases with an

increase of the predicted amount of firms' total initial capital, while it decreases with variables such as the number of owners and the work experience of founders that are indicative of greater personal wealth available to finance firms' start-up. Lastly, the size of the bank loans obtained by firms generally is small and it is quite insensitive to demand-side factors that instead determine the amount of personal and total capital, with the notable exception of scale economies in the industry of the start-up. In other words, in accordance with the argument that credit to NTBFs is rationed, the loan supply curve is highly inelastic, even though not perfectly so.

 This is a preview of subscription content, [log in via an institution](#)  to check access.

Access this article

[Log in via an institution](#) →

Subscribe and save

Springer+ Basic

€32.70 /Month

- Get 10 units per month
- Download Article/Chapter or eBook
- 1 Unit = 1 Article or 1 Chapter
- Cancel anytime

[Subscribe now](#) →

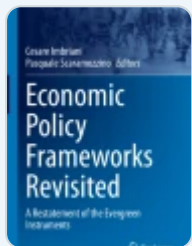
Buy Now

[Buy article PDF 39,95 €](#)

Price includes VAT (Poland)

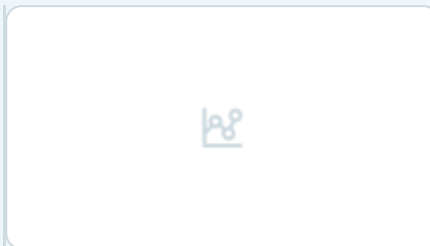
Instant access to the full article PDF.

Similar content being viewed by others



Bank Financing and Start-Up Survival in the Italian Economy

Chapter | © 2023



Determinants of credit availability for high-tech start-ups

Article | 03 June 2020



Entrepreneurial Finance

Chapter | © 2023

References

Acs, Z.J., 2004, 'The value of entrepreneurial start-ups to an economy', Seminar Discussion Paper, Diebold Institute for Public Policy Studies.

Ade, B., T. Heimer, F. Loch, T. Lehmann and V. Steimle, 2003, 'The new framework for capital adequacy (Basel II): Consequences for small and medium sized enterprises (SME) and presentation of political options for implementation', Background paper for European Parliament.

Alsos G.A. and Kolvereid L. (1998). The business gestation process of novice, serial and parallel business founders. *Entrepreneurship Theory and Practice* 22: 101-144 .

[Google Scholar](#)

Asquith P. and Mullins D.W. (1986). Equity issues and offering dilution. *Journal of Financial Economics* 15: 61-89 .

[Article](#) [Google Scholar](#)

Åstebro, T., 2002, 'Self-selection and bank loan screening on entrepreneurial ventures', University of Waterloo, Working Paper.

Åstebro, T. and I. Bernhardt, 1999, 'The winner's curse of human capital', Center for Economic Studies, Working Paper CES 99-5, U.S. Department of Commerce.

Åstebro T. and Bernhardt I. (2003). Start-up financing, owner characteristics and survival. *Journal of Economics and Business* 55: 303-320 .

[Article](#) [Google Scholar](#)

Audretsch D.B. (1995). Innovation and industry evolution. MIT Press, Cambridge, MA .

[Google Scholar](#)

Audretsch D.B. (2003). Standing on the shoulders of midgets: The U.S. Small Business Innovation Research Program (SBIR). *Small Business Economics* 20: 129-135 .

[Article](#) [Google Scholar](#)

Audretsch D.B. and Lehmann E.E. (2004). Financing high-tech growth: The role of banks and venture capitalists. *Schmalenbach Business Review* 56: 340-357 .

[Google Scholar](#)

Becker G.S. (1975). Human capital. National Bureau of Economic Research, New York .

[Google Scholar](#)

Berger A.N. and Udell G.F. (1998). The economics of small business finance: The

roles of private equity and debt markets in the financial growth cycle. *Journal of Banking and Finance* 22: 613-673 .

[Article](#) [Google Scholar](#)

Bertoni, F., M.G. Colombo, E. Piva, 2005, 'Country report on the venture capital industry: Italy, the false departure', Prime NoE, Venture Fun project, Working Paper.

Beugelsdijk S. and Cornet M. (2002). A far friend is worth more than a good neighbour: Proximity and innovation in a small country. *Journal of Management and Governance* 6: 169-188 .

[Article](#) [Google Scholar](#)

Black J. and Jeffreys D. (1996). House pricing, the supply of collateral and the enterprise economy. *Economic Journal* 106: 60-75 .

[Article](#) [Google Scholar](#)

Blanchflower D. and Oswald A. (1998). What makes an entrepreneur. *Journal of Labor Economics* 16: 26-60 .

[Article](#) [Google Scholar](#)

Bottazzi L. and Da Rin M. (2002). Venture capital in Europe and the financing of innovative companies. *Economic Policy* 17: 229-269 .

[Article](#) [Google Scholar](#)

Brealey R. and S. Myers, 2003, *Principles of Corporate Finance*, 7th edn., New York: Graw-Hill.

Bruno A.V. and Tyebjee T.T. (1985). The entrepreneur's search for capital. *Journal*

[Article](#) [Google Scholar](#)

Cabral L. (1995). Sunk costs, firm size and firm growth. *Journal of Industrial Economics* 43: 161-172 .

[Article](#) [Google Scholar](#)

Cabral L. and Mata J. (2003). On the evolution of firm size distribution: Facts and theory. *American Economic Review* 93: 1075-1090 .

[Article](#) [Google Scholar](#)

Carpenter R.E. and Petersen B.C. (2002a). Capital market imperfections, high-tech investment and new equity financing. *Economic Journal* 112: F54-F72 .

[Article](#) [Google Scholar](#)

Carpenter R.E. and Petersen B.C. (2002b). Is the growth of small firms constrained by internal finance?. *The Review of Economics and Statistics* 84: 298-309 .

[Article](#) [Google Scholar](#)

Carter N.M., Gartner W.B. and Reynold P.D. (1996). Exploring start-up event sequences. *Journal of Business Venturing* 11: 151-166 .

[Article](#) [Google Scholar](#)

Cassar G. (2004). The financing of business start-ups. *Journal of Business Venturing* 19: 261-283 .

[Article](#) [Google Scholar](#)

Caves R.E., Khalilzadeh-Shirazi J. and Porter M.E. (1975). Scale economies in statistical analyses of market power. *Review of Economics and Statistics* 57: 133–140 .

[Article](#) [Google Scholar](#)

Chittenden, F., G. Hall, and P. Hutchinson, 1996, 'Small firm growth, access to capital markets and financial structure: Review of issues and an empirical investigation', *Small Business Economics*, **8**, 59–67.

[Google Scholar](#)

Cole R.A. and Walken J.D. (1995). Financial services used by small businesses: Evidence from the 1993 national survey of small business finances. *Federal Reserve Bulletin* 81: 629–667 .

[Google Scholar](#)

Colombo M.G. and Delmastro M. (1999). Some stylized facts on organization and its evolution. *Journal of Economic Behavior & Organization* 40: 252–274 .

[Article](#) [Google Scholar](#)

Colombo M.G., Delmastro M. and Grilli L. (2004). Entrepreneurs' human capital and the start-up size of new technology-based firms. *International Journal of Industrial Organization* 22: 1183–1211 .

[Article](#) [Google Scholar](#)

Colombo M.G. and Grilli L. (2005a). Start-up size: the role of external financing. *Economics Letters* 88: 243–250 .

[Article](#) [Google Scholar](#)

Colombo M.G. and Grilli L. (2005b). Founders' human capital and the growth of

new technology-based firms: A competence-based view. *Research Policy* 34: 795-816 .

[Article](#) [Google Scholar](#)

(1991). Indicatori Economici Provinciali . Collana Industria e Territorio, SIPI, Roma .

[Google Scholar](#)

Cooper R.S. (2003). Purpose and performance of the Small Business Innovation Research (SBIR) Program. *Small Business Economics* 20: 137-151 .

[Article](#) [Google Scholar](#)

Cressy R. (1996). Are business start-ups debt-rationed?. *Economic Journal* 106: 1253-1270 .

[Article](#) [Google Scholar](#)

Cressy R. (2000). Credit rationing or entrepreneurial risk aversion? An alternative explanation for the Evans and Jovanovic finding. *Economics Letters* 66: 235-240 .

[Article](#) [Google Scholar](#)

Cressy R. and Toivanen O. (2001). Is there adverse selection in the credit market?. *Venture Capital: An International Journal of Entrepreneurial Finance* 3: 215-238 .

[Article](#) [Google Scholar](#)

Czarnitzki, D., 2002, 'Research and development: Financial constraints and the role of public funding for small and medium enterprises', ZEW Discussion Paper no. 02-74.

Da Rin, M., G. Nicodano and A. Sembenelli, 2005, 'Public policy and the creation of active venture capital markets', European Central Bank, Working Paper Series no. 430.

Masulis R. (1980). Optimal capital structure and corporate and personal taxation. *Journal of Financial Economics* 8: 3-29 .

[Article](#) [Google Scholar](#)

(2002). Overlending. *Economic Journal* 112: F17-31 .

[Article](#) [Google Scholar](#)

Denis D.J. (2004). Entrepreneurial finance: An overview. *Journal of Corporate Finance* 10: 301-326 .

[Article](#) [Google Scholar](#)

Dixit A.K. and Pindyck R.S. (1994). Investment under uncertainty. Princeton University Press, Princeton, NJ .

[Google Scholar](#)

Egeln J., Licht G. and Steil F. (1997). Firm foundations and the role of financial constraints. *Small Business Economics* 9: 137-150 .

[Article](#) [Google Scholar](#)

Evans D. and Jovanovic B. (1989). An estimated model of entrepreneurial choice under liquidity constraints. *Journal of Political Economy* 97: 808-827 .

[Article](#) [Google Scholar](#)

Evans D. and Leighton L. (1989). Some empirical aspects of entrepreneurship.

Fazzari S.M., Hubbard R.G. and Petersen B.C. (1988). Financing constraints and corporate investment. *Brookings Papers on Economic Activity* 2: 141-206 .

[Article](#) [Google Scholar](#)

Feldman M.P. and Kelley M.R. (2003). Leveraging research and development: Assessing the impact of the U.S. Advanced Technology Program. *Small Business Economics* 20: 153-165 .

[Article](#) [Google Scholar](#)

Freear J. (1990). Who bankrolls high-tech entrepreneurs?. *Journal of Business Venturing* 5: 77-89 .

[Article](#) [Google Scholar](#)

Giudici G. and Paleari S. (2000). The provision of finance to innovation: A survey conducted among Italian technology-based small firms. *Small Business Economics* 14: 37-53 .

[Article](#) [Google Scholar](#)

Giudici, G. and P. Roosenboom, 2002, Pricing initial public offerings on European 'new' stock markets, XIII Tor Vergata Financial Conference, Rome Italy.

Goldsmith R.W. (1969). Financial structure and development. Yale University Press, New Haven, CT .

[Google Scholar](#)

Gompers P. and Lerner J. (2001). The venture capital revolution. *Journal of*

[Article](#) [Google Scholar](#)

Görg H., Strobl E. and Ruane F. (2000). Determinants of firm start-up size: An application of quantile regression for Ireland. *Small Business Economics* 14: 211-222 .

[Article](#) [Google Scholar](#)

Greene, W.H., 2000, *Econometric Analysis*, 4th edn., Englewood Cliffs, NJ: Prentice Hall.

Harris M. and Raviv A. (1991). The theory of capital structure. *Journal of Finance* 46: 297-355 .

[Article](#) [Google Scholar](#)

Heron R. and Lie E. (2002). Operating performance and the method of payments in takeovers. *Journal of Financial and Quantitative Analysis* 37: 137-155 .

[Article](#) [Google Scholar](#)

Holtz-Eakin D., Joulfaian D. and Rosen H.S. (1994a). Entrepreneurial decisions and liquidity constraints. *Rand Journal of Economics* 25: 334-347 .

[Article](#) [Google Scholar](#)

Holtz-Eakin D., Joulfaian D. and Rosen H.S. (1994b). Sticking it out: Entrepreneurial survival and liquidity constraints. *Journal of Political Economy* 102: 53-75 .

[Article](#) [Google Scholar](#)

Hubbard R.G. (1998). Capital market imperfections and investment. *Journal of*

Huyghebaert, N. 2004, The capital structure of business start-ups: Policy implications, Department of Applied Economics, Katholieke Universiteit Leuven, Working Paper.

Huyghebaert, N. and L. Van de Gucht, 2004, The determinants of financial structure: new insights from business start-ups, Department of Applied Economics, Katholieke Universiteit Leuven, Working Paper.

Istituto G. Tagliacarne, 1998, *Sistema Starter*, 1998 Edition, Rome.

Jaffee D. and Russell T. (1976). Imperfect information, uncertainty and credit rationing. *Quarterly Journal of Economics* 90: 651-666 .

[Article](#) [Google Scholar](#)

King R.G. and Levine R. (1993). Finance and growth: Schumpeter might be right. *Quarterly Journal of Economics* 108: 713-737 .

[Article](#) [Google Scholar](#)

Kon Y. and Storey D. (2003). A theory of discouraged borrowers. *Small Business Economics* 21: 37-49 .

[Article](#) [Google Scholar](#)

Kortum, S. and J. Lerner, 1998, 'Does venture capital spur innovation?', NBER Working Paper no. 6846.

Laursen, K. and A. Salter, 2005, 'Open for innovation: The role of openness in

explaining innovative performance among U.K. manufacturing firms', *Strategic Management Journal*, forthcoming.

Lee I., Lochhead S., Ritter J. and Zhao Q. (1996). The costs of raising capital. *Journal of Financial Research* 19: 59-74 .

[Google Scholar](#)

Lerner J. (1999). The Government as venture capitalist: The long-run impact of the SBIR Program. *Journal of Business* 72: 285-318 .

[Article](#) [Google Scholar](#)

Lerner J. (2002). When bureaucrats meet entrepreneurs: The design of effective 'public venture capital' programmes. *Economic Journal* 112: F73-84 .

[Article](#) [Google Scholar](#)

Levenson A.R. and Willard K.L. (2000). Do firms get the financing they want? Measuring credit rationing experienced by small businesses in the U.S. *Small Business Economics* 14: 83-94 .

[Article](#) [Google Scholar](#)

Lindh T. and Ohlsson H. (1996). Self-employment and windfall gains: Evidence from the Swedish lottery. *Economic Journal* 106: 1515-1526 .

[Article](#) [Google Scholar](#)

Lyons B. (1980). A new measure of minimum efficient plant size. *Economica* 47: 19-34 .

[Article](#) [Google Scholar](#)

Maddala G.S. (1983). Limited-dependent and qualitative variables in

econometrics. Cambridge University Press, Cambridge .

[Google Scholar](#)

Manigart S. and Struyf C. (1997). Financing high-technology start-ups in Belgium: An explorative study. *Small Business Economics* 9: 125-135 .

[Article](#) [Google Scholar](#)

Marshall A. and Paley Marshall M. (1879). The Economics of Industry. Macmillan and Co, London .

[Google Scholar](#)

Mata J. (1996). Market, entrepreneurs and the size of new firms. *Economic Letters* 52: 89-94 .

[Article](#) [Google Scholar](#)

Mata J. and Machado J.A.F. (1996). Firm start-up size: A conditional quantile approach. *European Economic Review* 40: 1305-1323 .

[Article](#) [Google Scholar](#)

Meyer, B.D., 1990, Why are there so few black entrepreneurs?, NBER Working Paper no. 3537, Cambridge, MA.

Michaelas N., Chittenden F. and Poutziouris P. (1999). Financial policy and capital structure choice in U.K. SMEs Empirical evidence from company panel data. *Small Business Economics* 12: 113-130 .

[Article](#) [Google Scholar](#)

Modigliani F. and Miller M. (1958). The cost of capital, corporation finance and the theory of investment. *American Economic Review* 48: 261-297 .

Monck C.S.P., Porter R.B., Quintas P.R. and Storey D.J. (1988). *Science Parks and the Growth of High Technology Firms*. Croom Helm, London .

[Google Scholar](#)

Moore B. (1994). Financial constraints to the growth and development of small high-technology firms. In: Hughes, A. and Storey, D.J. (eds) *Finance and the Small Firm*, pp. Routledge, London .

[Google Scholar](#)

Myers S.C. (1977). Determinants of corporate borrowing. *Journal of Financial Economics* 5: 147-175 .

[Article](#) [Google Scholar](#)

Myers S.C. (1984). The capital structure puzzle. *Journal of Finance* 34: 575-592 .

[Article](#) [Google Scholar](#)

Oakey, R. 1995, *High-Technology New Firms: Variable Barriers to Growth*, New York: Chapman & Hall.

Pindyck R.S. (1991). Irreversibility, uncertainty and investment. *Journal of Economic Literature* 29: 1110-1148 .

[Google Scholar](#)

Rajan R. and Zingales L. (1995). Is there an optimal capital structure? Some evidence from international data. *Journal of Finance* 50: 1421-1460 .

[Article](#) [Google Scholar](#)

Rajan R. and Zingales L. (1998). Financial dependence and growth. *American Economic Review* 88: 559-586 .

[Google Scholar](#)

Rajan R. and Zingales L. (2003). The great reversals: The politics of financial development in the twentieth century. *Journal of Financial Economics* 69: 5-50 .

[Article](#) [Google Scholar](#)

Reynolds P. and Miller B. (1992). New firm gestation: conception, birth and implications for research. *Journal of Business Venturing* 7: 405-417 .

[Article](#) [Google Scholar](#)

Sahlman W.A. (1990). The structure and governance of venture capital organizations. *Journal of Financial Economics* 27: 473-524 .

[Article](#) [Google Scholar](#)

Santarelli E. and Vivarelli M. (2002). Is subsidizing entry an optimal policy?. *Industrial and Corporate Change* 11: 39-52 .

[Article](#) [Google Scholar](#)

Schertler A. (2001). Venture Capital in Europe's Common Market A Quantitative Description. The United Nations University, Institute for New Technologies, Maastricht, The Netherlands .

[Google Scholar](#)

Schumpeter J.A. (1911). A Theory of Economic Development. Harvard University Press, Cambridge, MA .

[Google Scholar](#)

Stiglitz J.E. and Weiss A. (1981). Credit rationing in markets with imperfect information. *American Economic Review* 71: 393-410 .

[Google Scholar](#)

Storey D.J. (1994a). New firm growth and bank financing. *Small Business Economics* 6: 139-150 .

[Article](#) [Google Scholar](#)

Storey D.J. (1994b). Understanding the Small Business Sector. Thomson Learning, London .

[Google Scholar](#)

Westhead P. and Storey D. J. (1997). Financial constraints on the growth of high technology small firms in the United Kingdom. *Applied Financial Economics* 7: 197-201 .

[Article](#) [Google Scholar](#)

Xu B. (1998). A reestimation of the Evans-Jovanovic entrepreneurial choice model. *Economics Letters* 58: 91-95.

[Article](#) [Google Scholar](#)

Author information

Authors and Affiliations

**Department of Economics, Management and Industrial Engineering,
Politecnico di Milano, P.za Leonardo da Vinci 32, 20133, Milan, Italy**

Massimo G. Colombo & Luca Grilli

Corresponding author

Rights and permissions

[Reprints and permissions](#)

About this article

Cite this article

Colombo, M.G., Grilli, L. Funding Gaps? Access To Bank Loans By High-Tech Start-Ups. *Small Bus Econ* **29**, 25–46 (2007). <https://doi.org/10.1007/s11187-005-4067-0>

Accepted

11 October 2005

DOI

<https://doi.org/10.1007/s11187-005-4067-0>

Published

07 October 2006

Issue Date

June 2007

Keywords

[new technology-based firms](#)

[start-up financing](#)

[bank loans](#)

[credit rationing](#)

JEL Classification

[G32](#)

[M13](#)

[O30](#)

Search

Search by keyword or author



Navigation

Find a journal

Publish with us

Track your research

