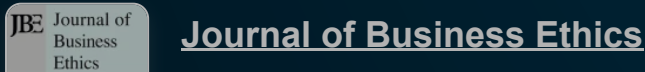


Home > Journal of Business Ethics > Article

Deal Structuring in Philanthropic Venture Capital Investments: Financing Instrument, Valuation and Covenants

Published: 29 April 2011

Volume 95, pages 121–145, (2010) [Cite this article](#)



Your privacy, your choice

We use essential cookies to make sure the site can function. We, and our 96 **partners**, also use optional cookies and similar technologies for advertising, personalisation of content, usage analysis, and social media.

By accepting optional cookies, you consent to allowing us and our partners to store and access personal data on your device, such as browsing behaviour and unique identifiers. Some third parties are outside of the European Economic Area, with varying standards of data protection. See our **privacy policy** for more information on the use of your personal data. Your consent choices apply to springer.com and applicable subdomains.

You can find further information, and change your preferences via 'Manage preferences'. You can also change your preferences or withdraw consent at any time via 'Your privacy choices', found in the footer of every page.

We use cookies and similar technologies for the following purposes:

- > **Store and/or access information on a device**
- > **Personalised advertising and content, advertising and content measurement, audience research and services development**

Accept all cookies

Reject optional cookies

Manage preferences

steward rather than as a principal. Conversely, while backing non-profit social ventures, philanthropic venture capitalists structure their deal similarly as traditional venture capital, as the absence of the non-distribution constraint makes such investments subject to moral hazard risk both in terms of perks and stealing and social impact focus.



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

Access this article

[Log in via an institution](#) →

Your privacy, your choice

We use essential cookies to make sure the site can function. We, and our 96 **partners**, also use optional cookies and similar technologies for advertising, personalisation of content, usage analysis, and social media.

By accepting optional cookies, you consent to allowing us and our partners to store and access personal data on your device, such as browsing behaviour and unique identifiers. Some third parties are outside of the European Economic Area, with varying standards of data protection. See our **privacy policy** for more information on the use of your personal data. Your consent choices apply to [springer.com](#) and applicable subdomains.

You can find further information, and change your preferences via 'Manage preferences'. You can also change your preferences or withdraw consent at any time via 'Your privacy choices', found in the footer of every page.

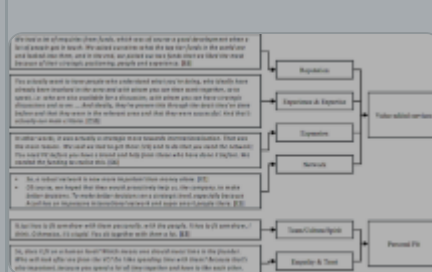
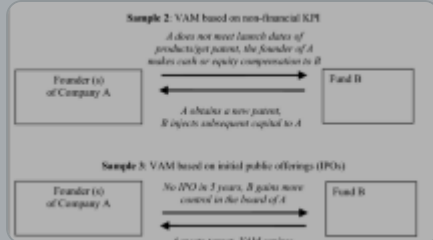
We use cookies and similar technologies for the following purposes:

- Store and/or access information on a device**
- Personalised advertising and content, advertising and content measurement, audience research and services development**

Accept all cookies

Reject optional cookies

Manage preferences



Contractual Innovation in China's Venture Capital Market

Article | 11 March 2020

Deal or no deal? Understanding entrepreneurs' criteria and deal breaker in investor selection processes

Article | Open access
10 October 2024

Financing Rounds with Private Capital

Chapter | © 2022

Explore related subjects

Your privacy, your choice

We use essential cookies to make sure the site can function. We, and our 96 **partners**, also use optional cookies and similar technologies for advertising, personalisation of content, usage analysis, and social media.

By accepting optional cookies, you consent to allowing us and our partners to store and access personal data on your device, such as browsing behaviour and unique identifiers. Some third parties are outside of the European Economic Area, with varying standards of data protection. See our **privacy policy** for more information on the use of your personal data. Your consent choices apply to springer.com and applicable subdomains.

You can find further information, and change your preferences via 'Manage preferences'. You can also change your preferences or withdraw consent at any time via 'Your privacy choices', found in the footer of every page.

We use cookies and similar technologies for the following purposes:

Store and/or access information on a device

Personalised advertising and content, advertising and content measurement, audience research and services development

Accept all cookies

Reject optional cookies

Manage preferences

Aleman, L. and M. R. Scarlata: 2009, 'Philanthropic Venture Capital: A New Model of Financing for Social Entrepreneurs', in D. Cumming (ed.), *Companion to Venture Capital*, Chapter 7 (Wiley Press).

Allen, F.: 1985, 'On the Fixed Nature of Sharecropping Contracts', *Economic Journal* 95(377), 30-48.

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

American Association for Public Opinion Research: 2008, *Standard Definitions:*

Your privacy, your choice

We use essential cookies to make sure the site can function. We, and our 96 **partners**, also use optional cookies and similar technologies for advertising, personalisation of content, usage analysis, and social media.

By accepting optional cookies, you consent to allowing us and our partners to store and access personal data on your device, such as browsing behaviour and unique identifiers. Some third parties are outside of the European Economic Area, with varying standards of data protection. See our **privacy policy** for more information on the use of your personal data. Your consent choices apply to springer.com and applicable subdomains.

You can find further information, and change your preferences via 'Manage preferences'. You can also change your preferences or withdraw consent at any time via 'Your privacy choices', found in the footer of every page.

We use cookies and similar technologies for the following purposes:

Store and/or access information on a device

Personalised advertising and content, advertising and content measurement, audience research and services development

[Accept all cookies](#)

[Reject optional cookies](#)

[Manage preferences](#)

Balbo, L., D. Mortell and P. Oostlander: 2008, '*Establishing a Venture Philanthropy Fund in Europe*', EVPA Publications (Brussels, BE).

[Google Scholar](#)

Barboza, G. and S. Trejos: 2009, 'Micro Credit in Chiapas, México: Poverty Reduction through Group Lending', *Journal of Business Ethics* 88, 283-299.

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

Barney, J. B., L. W. Busenitz, J. O. Fiet and D. Moesel: 1989, The Structure of

Your privacy, your choice

We use essential cookies to make sure the site can function. We, and our 96 **partners**, also use optional cookies and similar technologies for advertising, personalisation of content, usage analysis, and social media.

By accepting optional cookies, you consent to allowing us and our partners to store and access personal data on your device, such as browsing behaviour and unique identifiers. Some third parties are outside of the European Economic Area, with varying standards of data protection. See our **privacy policy** for more information on the use of your personal data. Your consent choices apply to springer.com and applicable subdomains.

You can find further information, and change your preferences via 'Manage preferences'. You can also change your preferences or withdraw consent at any time via 'Your privacy choices', found in the footer of every page.

We use cookies and similar technologies for the following purposes:

Store and/or access information on a device

Personalised advertising and content, advertising and content measurement, audience research and services development

[Accept all cookies](#)

[Reject optional cookies](#)

[Manage preferences](#)

Bhagat, S.: 1983, 'The Effect of Pre-Emptive Right Amendments on Shareholder Wealth', *Journal of Financial Economics* 12(3), 289-310.

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

Certo, S.T. and T. Miller: 2008, 'Social Entrepreneurship: Key Issues and Concepts', *Business Horizons* 51(4), 267-271.

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

Chan, Y.S., D. Siegel and A.V. Thakor: 1990, 'Learning, Corporate Control and Performance Requirements in Venture Capital Contracts', *International Economic Review* 31(2), 365.

Your privacy, your choice

We use essential cookies to make sure the site can function. We, and our 96 **partners**, also use optional cookies and similar technologies for advertising, personalisation of content, usage analysis, and social media.

By accepting optional cookies, you consent to allowing us and our partners to store and access personal data on your device, such as browsing behaviour and unique identifiers. Some third parties are outside of the European Economic Area, with varying standards of data protection. See our **privacy policy** for more information on the use of your personal data. Your consent choices apply to springer.com and applicable subdomains.

You can find further information, and change your preferences via 'Manage preferences'. You can also change your preferences or withdraw consent at any time via 'Your privacy choices', found in the footer of every page.

We use cookies and similar technologies for the following purposes:

Store and/or access information on a device

Personalised advertising and content, advertising and content measurement, audience research and services development

[Accept all cookies](#)

[Reject optional cookies](#)

[Manage preferences](#)

Cumming, D.J.: 2005, 'Capital Structure in Venture Finance', *Journal of Corporate Finance* 11(3), 550-585.

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

Cumming, D.J.: 2006, 'Adverse Selection and Capital Structure: Evidence from Venture Capital', *Entrepreneurship: Theory & Practice* 30(2), 155-183.

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

Cumming, D.J. and S. Johan: 2007, 'Socially Responsible Institutional Investment in Private Equity', *Journal of Business Ethics* 75(4), 395-416.

Your privacy, your choice

We use essential cookies to make sure the site can function. We, and our 96 **partners**, also use optional cookies and similar technologies for advertising, personalisation of content, usage analysis, and social media.

By accepting optional cookies, you consent to allowing us and our partners to store and access personal data on your device, such as browsing behaviour and unique identifiers. Some third parties are outside of the European Economic Area, with varying standards of data protection. See our **privacy policy** for more information on the use of your personal data. Your consent choices apply to springer.com and applicable subdomains.

You can find further information, and change your preferences via 'Manage preferences'. You can also change your preferences or withdraw consent at any time via 'Your privacy choices', found in the footer of every page.

We use cookies and similar technologies for the following purposes:

Store and/or access information on a device

Personalised advertising and content, advertising and content measurement, audience research and services development

[Accept all cookies](#)

[Reject optional cookies](#)

[Manage preferences](#)

Diamond, D.: 1991, 'Debt Maturity Structure and Liquidity Risk', *Quarterly Journal of Economics* 106(3), 709-737.

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

Dillenburg, S., T. Greene and H. Erekson: 2003, 'Approaching Socially Responsible Investment with a Comprehensive Ratings Scheme: Total Social Impact', *Journal of Business Ethics* 43(3), 167-177.

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

Donaldson, L. and J.H. Davis: 1991, 'Stewardship Theory Or Agency Theory: CEO Governance and Shareholder Returns', *Australian Journal of Management* 16(1), 40.

Your privacy, your choice

We use essential cookies to make sure the site can function. We, and our 96 **partners**, also use optional cookies and similar technologies for advertising, personalisation of content, usage analysis, and social media.

By accepting optional cookies, you consent to allowing us and our partners to store and access personal data on your device, such as browsing behaviour and unique identifiers. Some third parties are outside of the European Economic Area, with varying standards of data protection. See our **privacy policy** for more information on the use of your personal data. Your consent choices apply to springer.com and applicable subdomains.

You can find further information, and change your preferences via 'Manage preferences'. You can also change your preferences or withdraw consent at any time via 'Your privacy choices', found in the footer of every page.

We use cookies and similar technologies for the following purposes:

Store and/or access information on a device

Personalised advertising and content, advertising and content measurement, audience research and services development

[Accept all cookies](#)

[Reject optional cookies](#)

[Manage preferences](#)

(EVPA Publications).

Fama, E.F. and M.C. Jensen: 1983a, 'Agency Problems and Residual Claims', *Journal of Law & Economics* 26(2), 327-350.

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

Fama, E.F. and M.C. Jensen: 1983b, 'Separation of Ownership and Control', *Journal of Law & Economics* 26(2), 301-326.

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

Folkman, P., J. Froud, J. Sukhdev and K. Williams: 2006, 'Working for Themselves? Capital Market Intermediaries and Present Day Capitalism', Working Paper

Your privacy, your choice

We use essential cookies to make sure the site can function. We, and our 96 **partners**, also use optional cookies and similar technologies for advertising, personalisation of content, usage analysis, and social media.

By accepting optional cookies, you consent to allowing us and our partners to store and access personal data on your device, such as browsing behaviour and unique identifiers. Some third parties are outside of the European Economic Area, with varying standards of data protection. See our **privacy policy** for more information on the use of your personal data. Your consent choices apply to springer.com and applicable subdomains.

You can find further information, and change your preferences via 'Manage preferences'. You can also change your preferences or withdraw consent at any time via 'Your privacy choices', found in the footer of every page.

We use cookies and similar technologies for the following purposes:

- Store and/or access information on a device**
- Personalised advertising and content, advertising and content measurement, audience research and services development**

Accept all cookies

Reject optional cookies

Manage preferences

Grossman, S.J. and O.D. Hart: 1986, 'The Costs and Benefits of Ownership: A Theory of Vertical and Lateral Integration', *Journal of Political Economy* 94(4), 691-719.

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

Guay, T., J.P. Doh and G. Sinclair: 2004, 'Non-Governmental Organizations, Shareholder Activism, and Socially Responsible Investments: Ethical, Strategic, and Governance Implications', *Journal of Business Ethics* 52(1), 125-139.

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

Hansmann, H.: 1980, 'The Role of Non-Profit Enterprise', *Yale Law Journal* 89(5), 835-901.

Your privacy, your choice

We use essential cookies to make sure the site can function. We, and our 96 **partners**, also use optional cookies and similar technologies for advertising, personalisation of content, usage analysis, and social media.

By accepting optional cookies, you consent to allowing us and our partners to store and access personal data on your device, such as browsing behaviour and unique identifiers. Some third parties are outside of the European Economic Area, with varying standards of data protection. See our **privacy policy** for more information on the use of your personal data. Your consent choices apply to springer.com and applicable subdomains.

You can find further information, and change your preferences via 'Manage preferences'. You can also change your preferences or withdraw consent at any time via 'Your privacy choices', found in the footer of every page.

We use cookies and similar technologies for the following purposes:

Store and/or access information on a device

Personalised advertising and content, advertising and content measurement, audience research and services development

[Accept all cookies](#)

[Reject optional cookies](#)

[Manage preferences](#)

Hisrich, R.D. and A.D. Jankowicz: 1990, 'Intuition in Venture Capital Decisions: An Exploratory Study using a New Technique', *Journal of Business Venturing* 5(1), 49.

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

Holmstrom, B.: 1979, 'Moral Hazard and Observability', *Bell Journal of Economics* 10(1), 74-91.

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

Irvine, W.B.: 1987, 'The Ethics of Investing', *Journal of Business Ethics* 6(3), 233-242.

Your privacy, your choice

We use essential cookies to make sure the site can function. We, and our 96 **partners**, also use optional cookies and similar technologies for advertising, personalisation of content, usage analysis, and social media.

By accepting optional cookies, you consent to allowing us and our partners to store and access personal data on your device, such as browsing behaviour and unique identifiers. Some third parties are outside of the European Economic Area, with varying standards of data protection. See our **privacy policy** for more information on the use of your personal data. Your consent choices apply to springer.com and applicable subdomains.

You can find further information, and change your preferences via 'Manage preferences'. You can also change your preferences or withdraw consent at any time via 'Your privacy choices', found in the footer of every page.

We use cookies and similar technologies for the following purposes:

Store and/or access information on a device

Personalised advertising and content, advertising and content measurement, audience research and services development

[Accept all cookies](#)

[Reject optional cookies](#)

[Manage preferences](#)

Kaplan, S.N. and P. Strömberg: 2001, 'Venture Capitalists as Principals: Contracting, Screening, and Monitoring', *American Economic Review* 91(2), 426-430.

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

Kihlstrom, R.E. and J. Laffont: 1979, 'A General Equilibrium Entrepreneurial Theory of Firm Formation Based on Risk Aversion', *Journal of Political Economy* 87(4), 719-748.

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

Your privacy, your choice

We use essential cookies to make sure the site can function. We, and our 96 **partners**, also use optional cookies and similar technologies for advertising, personalisation of content, usage analysis, and social media.

By accepting optional cookies, you consent to allowing us and our partners to store and access personal data on your device, such as browsing behaviour and unique identifiers. Some third parties are outside of the European Economic Area, with varying standards of data protection. See our **privacy policy** for more information on the use of your personal data. Your consent choices apply to springer.com and applicable subdomains.

You can find further information, and change your preferences via 'Manage preferences'. You can also change your preferences or withdraw consent at any time via 'Your privacy choices', found in the footer of every page.

We use cookies and similar technologies for the following purposes:

Store and/or access information on a device

Personalised advertising and content, advertising and content measurement, audience research and services development

[Accept all cookies](#)[Reject optional cookies](#)[Manage preferences](#)

MacIntosh, J. G.: 1994, *Legal and Institutional Barriers to Financing Innovative Enterprise in Canada*, Monograph Prepared for the Government and Competitiveness Project, School of Policy Studies (Queen's University, Toronto, Canada).

MacMillan, I., R. Siegel and P. Narasimha: 1985, 'Criteria used by Venture Capitalists to Evaluate New Venture Proposals', *Journal of Business Venturing* 1(1), 119-128.

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

Manigart, S., M. Wright, K. Robbie, P. Desbrières and K. De Waele: 1997, 'Venture Capitalists' Appraisal of Investment Projects: An Empirical European Study', *Entrepreneurship: Theory & Practice* 21(4), 29-43.

Your privacy, your choice

We use essential cookies to make sure the site can function. We, and our 96 **partners**, also use optional cookies and similar technologies for advertising, personalisation of content, usage analysis, and social media.

By accepting optional cookies, you consent to allowing us and our partners to store and access personal data on your device, such as browsing behaviour and unique identifiers. Some third parties are outside of the European Economic Area, with varying standards of data protection. See our **privacy policy** for more information on the use of your personal data. Your consent choices apply to springer.com and applicable subdomains.

You can find further information, and change your preferences via 'Manage preferences'. You can also change your preferences or withdraw consent at any time via 'Your privacy choices', found in the footer of every page.

We use cookies and similar technologies for the following purposes:

Store and/or access information on a device

Personalised advertising and content, advertising and content measurement, audience research and services development

[Accept all cookies](#)

[Reject optional cookies](#)

[Manage preferences](#)

Muth, M.M. and L. Donaldson: 1998, 'Stewardship Theory and Board Structure: A Contingency Approach', *Corporate Governance: An International Review* 6(1), 5-28.

National Venture Capital Association: 2009, www.nvca.org. Last access 09/2008.

Neuendorf, K.A.: 2002, *'The Content Analysis Guidebook'*, (Thousand Oaks, Calif.; London, Sage), pp. 301.

Your privacy, your choice

We use essential cookies to make sure the site can function. We, and our 96 **partners**, also use optional cookies and similar technologies for advertising, personalisation of content, usage analysis, and social media.

By accepting optional cookies, you consent to allowing us and our partners to store and access personal data on your device, such as browsing behaviour and unique identifiers. Some third parties are outside of the European Economic Area, with varying standards of data protection. See our **privacy policy** for more information on the use of your personal data. Your consent choices apply to springer.com and applicable subdomains.

You can find further information, and change your preferences via 'Manage preferences'. You can also change your preferences or withdraw consent at any time via 'Your privacy choices', found in the footer of every page.

We use cookies and similar technologies for the following purposes:

Store and/or access information on a device

Personalised advertising and content, advertising and content measurement, audience research and services development

[Accept all cookies](#)

[Reject optional cookies](#)

[Manage preferences](#)

Ross, S.A.: 1977, 'The Determination of Financial Structure: The Incentive-Signalling Approach', *Bell Journal of Economics* 8(1), 23-40.

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

Rudd, A.: 1981, 'Social Responsibility and Portfolio Performance', *California Management Review* 23(4), 55-61.

[Google Scholar](#)

Ruhnka, J. and J.E. Young: 1987, 'A Venture Capital Model of the Development Process for New Ventures', *Journal of Business Venturing* 2(2), 167.

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

Your privacy, your choice

We use essential cookies to make sure the site can function. We, and our 96 **partners**, also use optional cookies and similar technologies for advertising, personalisation of content, usage analysis, and social media.

By accepting optional cookies, you consent to allowing us and our partners to store and access personal data on your device, such as browsing behaviour and unique identifiers. Some third parties are outside of the European Economic Area, with varying standards of data protection. See our **privacy policy** for more information on the use of your personal data. Your consent choices apply to springer.com and applicable subdomains.

You can find further information, and change your preferences via 'Manage preferences'. You can also change your preferences or withdraw consent at any time via 'Your privacy choices', found in the footer of every page.

We use cookies and similar technologies for the following purposes:

Store and/or access information on a device

Personalised advertising and content, advertising and content measurement, audience research and services development

[Accept all cookies](#)

[Reject optional cookies](#)

[Manage preferences](#)

Scarlata, M.R. and L. Alemany: 2010, 'Philanthropic Venture Capital from a Global Perspective: Definition and Investment Strategy', in D. Cumming (ed.), *Handbook of Entrepreneurial Finance*, (Oxford, UK, Oxford University Press).

[Google Scholar](#)

Sethi, S.P.: 2005, 'Investing in Socially Responsible Companies is a must for Public Pension Funds – because there is no Better Alternative', *Journal of Business Ethics* 56(2), 99-129.

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

Smart, G.: 1999, 'Management Assessment Methods in Venture Capital: An Empirical Analysis of Human Capital Valuation', *Venture Capital* 1(1), 59-82.

Your privacy, your choice

We use essential cookies to make sure the site can function. We, and our 96 **partners**, also use optional cookies and similar technologies for advertising, personalisation of content, usage analysis, and social media.

By accepting optional cookies, you consent to allowing us and our partners to store and access personal data on your device, such as browsing behaviour and unique identifiers. Some third parties are outside of the European Economic Area, with varying standards of data protection. See our **privacy policy** for more information on the use of your personal data. Your consent choices apply to springer.com and applicable subdomains.

You can find further information, and change your preferences via 'Manage preferences'. You can also change your preferences or withdraw consent at any time via 'Your privacy choices', found in the footer of every page.

We use cookies and similar technologies for the following purposes:

Store and/or access information on a device

Personalised advertising and content, advertising and content measurement, audience research and services development

[Accept all cookies](#)

[Reject optional cookies](#)

[Manage preferences](#)

Activity', *Management Science* 30(9), 1051-1066.

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

Van Slyke, D. and H. Newman: 2006, 'Venture Philanthropy and Social Entrepreneurship in Community Redevelopment', *Nonprofit Management & Leadership* 16(3), 345-368.

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

Wedig, G.J., M. Hassan and M.A. Morrissey: 1996, 'Tax-Exempt Debt and the Capital Structure of Nonprofit Organizations: An Application to Hospitals', *Journal of Finance* 51(4), 1247-1283.

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

Your privacy, your choice

We use essential cookies to make sure the site can function. We, and our 96 **partners**, also use optional cookies and similar technologies for advertising, personalisation of content, usage analysis, and social media.

By accepting optional cookies, you consent to allowing us and our partners to store and access personal data on your device, such as browsing behaviour and unique identifiers. Some third parties are outside of the European Economic Area, with varying standards of data protection. See our **privacy policy** for more information on the use of your personal data. Your consent choices apply to springer.com and applicable subdomains.

You can find further information, and change your preferences via 'Manage preferences'. You can also change your preferences or withdraw consent at any time via 'Your privacy choices', found in the footer of every page.

We use cookies and similar technologies for the following purposes:

Store and/or access information on a device

Personalised advertising and content, advertising and content measurement, audience research and services development

[Accept all cookies](#)

[Reject optional cookies](#)

[Manage preferences](#)

Zacharakis, A., G.D. Meyer and J. DeCastro: 1999, 'Differing Perceptions of New Venture Failure: A Matched Exploratory Study of Venture Capitalists and Entrepreneurs', *Journal of Small Business Management* 37(3), 1-14.

[Google Scholar](#)

Author information

Authors and Affiliations

London School of Economics and Political Science, London, U.K.

Mariarosa Scarlata

ESADE Business School - URI, Barcelona, Spain

Your privacy, your choice

We use essential cookies to make sure the site can function. We, and our 96 **partners**, also use optional cookies and similar technologies for advertising, personalisation of content, usage analysis, and social media.

By accepting optional cookies, you consent to allowing us and our partners to store and access personal data on your device, such as browsing behaviour and unique identifiers. Some third parties are outside of the European Economic Area, with varying standards of data protection. See our **privacy policy** for more information on the use of your personal data. Your consent choices apply to springer.com and applicable subdomains.

You can find further information, and change your preferences via 'Manage preferences'. You can also change your preferences or withdraw consent at any time via 'Your privacy choices', found in the footer of every page.

We use cookies and similar technologies for the following purposes:

- Store and/or access information on a device**
- Personalised advertising and content, advertising and content measurement, audience research and services development**

Accept all cookies

Reject optional cookies

Manage preferences

Key words

[covenants](#)[social entrepreneurship](#)[socially responsible investment](#)[stewardship](#)[trust](#)[venture capital](#)[venture philanthropy](#)

Search

Search by keyword or author



Navigation

Your privacy, your choice

We use essential cookies to make sure the site can function. We, and our 96 [partners](#), also use optional cookies and similar technologies for advertising, personalisation of content, usage analysis, and social media.

By accepting optional cookies, you consent to allowing us and our partners to store and access personal data on your device, such as browsing behaviour and unique identifiers. Some third parties are outside of the European Economic Area, with varying standards of data protection. See our [privacy policy](#) for more information on the use of your personal data. Your consent choices apply to springer.com and applicable subdomains.

You can find further information, and change your preferences via 'Manage preferences'. You can also change your preferences or withdraw consent at any time via 'Your privacy choices', found in the footer of every page.

We use cookies and similar technologies for the following purposes:

Store and/or access information on a device

Personalised advertising and content, advertising and content measurement, audience research and services development

[Accept all cookies](#)

[Reject optional cookies](#)

[Manage preferences](#)

Your privacy, your choice

We use essential cookies to make sure the site can function. We, and our 96 [partners](#), also use optional cookies and similar technologies for advertising, personalisation of content, usage analysis, and social media.

By accepting optional cookies, you consent to allowing us and our partners to store and access personal data on your device, such as browsing behaviour and unique identifiers. Some third parties are outside of the European Economic Area, with varying standards of data protection. See our [privacy policy](#) for more information on the use of your personal data. Your consent choices apply to [springer.com](#) and applicable subdomains.

You can find further information, and change your preferences via 'Manage preferences'. You can also change your preferences or withdraw consent at any time via 'Your privacy choices', found in the footer of every page.

We use cookies and similar technologies for the following purposes:

Store and/or access information on a device

Personalised advertising and content, advertising and content measurement, audience research and services development

[Accept all cookies](#)

[Reject optional cookies](#)

[Manage preferences](#)