RÉSEAU CAPITAL

Economic Footprint Assessment

An Assessment of Quebec's Venture Capital and Private Equity Industry

September 2024

Disclaimer

Ernst & Young LLP ("EY") was engaged by Réseau Capital to conduct an economic footprint assessment of Venture Capital ("VC") and Private Equity ("PE") industry in Quebec, which includes impacts generated by VC and PE industry, broader socioeconomic benefits and an assessment of the impacts of VC and PE funding on company performance. In preparing this document ("Report"), EY relied upon unaudited data and information from Réseau Capital, Statistics Canada, PitchBook, Capital IQ as well as other third-party resources (collectively, the "Supporting Information"). EY reserves the right to revise any analyses, observations or comments referred to in this Report, if additional Supporting Information becomes available to us subsequent to the release of this Report. EY has assumed the Supporting Information to be accurate, complete and appropriate for the purposes of the Report. EY did not audit or independently verify the accuracy or completeness of the Supporting Information. Accordingly, EY expresses no opinion or other forms of assurance in respect of the Supporting Information and does not accept any responsibility for errors or omissions, or any loss or damage as a result of any persons relying on this Report for any purpose other than that for which it has been prepared.

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1. Executive Summary

Economic Impact of the VC and PE Industry, 2022[1,2]

Over **$45 B** in GDP[3]

generated or sustained by VC and PE backed companies annually

Over **$27 B** in Income

generated or sustained by VC and PE backed companies annually

520,000+ Jobs

Supported by VC and PE backed companies annually

Broader Socioeconomic Footprint

1 Improved Company Performance

Through greater leadership capabilities, networking, and operational efficiencies and synergies, VC and PE backed companies report:

- Higher revenues, profits, and productivity compared to pre-funding trends
- Better performance compared to non-funded companies in the same industry

2 Greater Focus on Innovation

VC and PE backed companies showcase:

- A surge in research and development (R&D) expenditures immediately after receiving funding
- Development of new products, technologies, and patents

3 Sustainability, DEI, and Human Capital Development

VC and PE firms generate other benefits through:

- Higher investment in clean technologies and renewables
- Focus on Diversity, Equity, and Inclusion (DEI)
- Encouraging training and human capital development, driving the innovation ecosystem

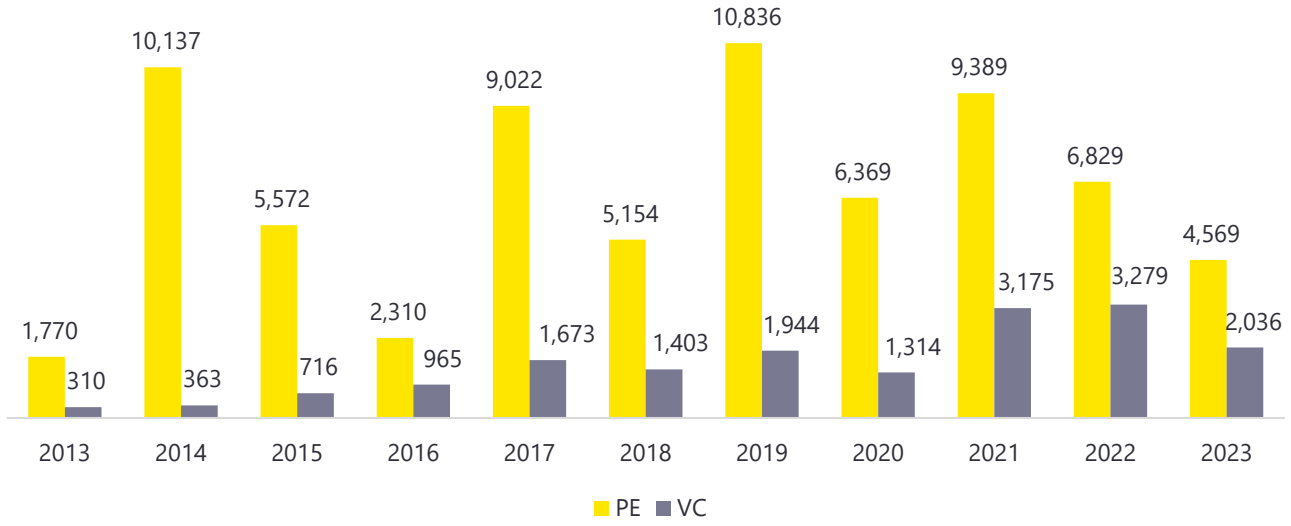
Sources: Réseau Capital, Statistics Canada, PitchBook, and EY Analysis.
[1] Due to limited availability of company-level financial information at the time of analysis, 2022 is used as the reference year for the economic impact assessment. [2] The economic impact analysis does not include publicly-listed companies that received a private placement, with the exception of those involved in mineral exploration and mining activities. [3] GDP – Gross Domestic Product

2. State of the Industry

Historically, the VC and PE industry has seen major investments in Quebec-based companies.

- Between 2013 and 2023, the Compound Annual Growth Rate (CAGR) of PE investments was estimated at **9.9%.**
- Over the same timeframe, VC investments had a CAGR of **20.7%.**

VC and PE Investments (in $M)
2013 - 2023



Sources: Réseau Capital, PitchBook, and EY Analysis.
Note: Angel investments are grouped with VC investments as both target early-stage start-ups.

Key Facts and Figures

2013 – 2023

5,400+
Deals

3,000+
Unique Companies

$89 B+
Total Investment

$3.6 B
Private Investment in Public Equity

$1.7 B
Investment in Clean Technology

3. The Economic Impact of the VC and PE Industry

In 2022, estimated VC and PE investment in Quebec was approximately **$10.1 B**.[1]

Such investments can support economic activity for several years beyond the initial investment stage. This continued benefit is sustained through VC and PE targets such as scaled operations, optimized company performance, and development of new products and technologies, among other goals.

Venture Capital

200+
Number of deals

$16 M
Average deal size

Benefits of VC investment:

- Knowledge and R&D spillover effects
- Contributions to the entrepreneurship ecosystem
- Focus on technology, digitization, and high-tech sectors[2]

Private Equity

540+
Number of deals

$13 M
Average deal size

Benefits of PE investment:

- Improved leadership capabilities, networking, operational efficiencies and synergies
- Enhanced productivity
- Expansion into new products and markets

Sources: Réseau Capital, PitchBook, and EY Analysis.
[1] Due to limited availability of company-level financial information at the time of analysis, 2022 is used as the reference year for the economic impact assessment. [2] High tech sectors include, but are not limited to Internet and Software Services, Healthcare and Life Sciences, and Clean Technology, among others.

3. The Economic Impact of the VC and PE Industry

Estimating Industry Expenditures

The following steps were taken to estimate the economic impact of the VC and PE industry:

1. Capturing Industry Activity

   For the purposes of this study, the VC and PE industry is defined as companies in Quebec with active VC or PE funding. It is important to note that this does not include the related activity of VC and PE firms themselves.

2. Estimating Industry Expenditures

   Annual expenditure data for VC and PE backed companies was collected and analyzed to estimate economic activity associated with the VC and PE industry in Quebec. In 2022, total expenditures by VC and PE backed companies were estimated at approximately $46 billion.

A detailed description of the steps involved in this process is provided in **Appendix A**.

Data Analysis for Economic Impact Assessment

Step 1: Identify companies with active investments

Step 2: Collect expenditure data from PitchBook

Step 3: Estimate industry-wide expenditures

Estimated Expenditures (in $M)

FY 2022

	Capital Expenditures	Operational Expenditures	Total
VC backed companies	231	14,324	14,555
PE backed companies	7,789	23,196	30,985
Total	***8,020***	***37,520***	***45,540***

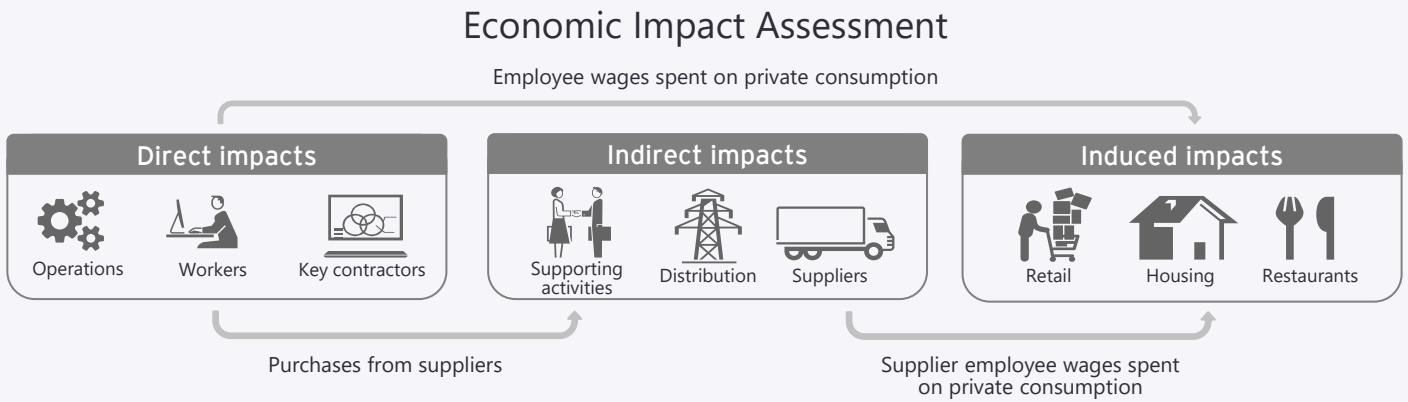
Note: The economic impact analysis does not include publicly-listed companies that received a private placement, with the exception of those involved in mineral exploration and mining activities.

Sources: Réseau Capital, PitchBook, and EY Analysis.

3. The Economic Impact of the VC and PE Industry

Economic Impact Assessment

EY's proprietary economic impact assessment model was utilized to estimate the economic impact of the VC and PE industry. The model incorporated inputs from Statistics Canada, and operational and capital expenditures estimates of VC and PE backed companies from PitchBook. The assessment is based on the principles of the input-output (I-O) model, which captures economic impacts across the supply chain through three distinct channels: direct, indirect, and induced impacts.



Economic impacts are presented across three key indicators:

GDP: a measure of the value of all final goods and services produced within a region.

Wages/Salaries: a component of GDP that measures total employee compensation and proprietor income.

Full-time-equivalent (FTE) jobs: refers to total number of jobs that are converted to full-time equivalence.

Please see **Appendix B** for further details regarding key assumptions and limitations of the I-O model.

3. The Economic Impact of the VC and PE Industry

VC and PE Investments Support Economic & Business Activity

- In addition to a one-time boost in business activity through initial investments, the industry supports sustained benefits through the operations of VC and PE backed companies.
- In 2022, VC and PE backed companies made notable contributions to Quebec's economy. Estimated direct expenditures of VC and PE backed companies represent approximately **8% of Quebec's GDP**.
- When accounting for all economic activity across the supply chain, operations and capital expenditures of these companies were estimated to contribute over **$45 billion** in GDP, over **$27 billion** in wages and salaries, and over **520,000 jobs.**

8% Estimated direct expenditures as a share of 2022 GDP in Quebec

VC and PE Backed Companies Directly Support Economic Activity in Quebec

The Economic Impact of the VC and PE Industry
2022

Over $45 B in GDP

generated or sustained by VC and PE backed companies annually

Over $27 B in Income

generated or sustained by VC and PE backed companies annually

520,000+ Jobs

Supported by VC and PE backed companies annually

Please see **Appendix C** for a detailed breakdown of economic impact results.

Sources: Réseau Capital, Statistics Canada, PitchBook, and EY Analysis.

3. The Economic Impact of the VC and PE Industry

VC and PE Investments Support Economic & Business Activity

Below is an overview of the estimated economic impacts from PE backed companies:

- GDP: PE backed companies were estimated to contribute **$29.9 billion** in GDP.
- Employment and Labour Income: Across the province, operations and capital expenditures of PE backed companies were estimated to support **346,199 FTE jobs**, and **$16.3 billion** in labour income.

The Economic Impact of the PE Industry
2022

Total Economic Impacts	GDP ($M)	Labour Income ($M)	Jobs (FTEs)
Direct	17,348	9,725	214,719
Indirect	7,105	4,335	75,247
Induced	5,540	2,249	56,233
Total	**29,993**	**16,309**	**346,199**

Please see **Appendix C** for a detailed breakdown of economic impact results.

Sources: Réseau Capital, Statistics Canada, PitchBook, and EY Analysis.

3. The Economic Impact of the VC and PE Industry

VC and PE Investments Support Economic & Business Activity

Below is an overview of the estimated economic impacts from VC backed companies:

- GDP: VC backed companies were estimated to contribute **$15.1 billion** in GDP.
- Employment and Labour Income: Across the province, operations and capital expenditures of VC backed companies were estimated to support **173,814 FTE jobs**, and **$10.9 billion** in labour income.

The Economic Impact of the VC Industry
2022

Total Economic Impacts	GDP ($M)	Labour Income ($M)	Jobs (FTEs)
Direct	9,045	7,232	109,676
Indirect	3,196	2,169	35,186
Induced	2,852	1,538	28,952
Total	**15,093**	**10,939**	**173,814**

Please see **Appendix C** for a detailed breakdown of economic impact results.

Sources: Réseau Capital, Statistics Canada, PitchBook, and EY Analysis.

4. Impact of VC and PE Investments on Company Outcomes

VC and PE Investments Influence Company Outcomes

By supporting greater leadership capabilities, networking, and operational efficiencies and synergies, VC and PE backed companies report improved performance through:

Improved Financial Outcomes

Higher revenues, profits, and productivity compared to pre-funding trends, and better performance compared to non-funded companies

Focus on R&D and Innovation

A surge in R&D expenditures immediately after receiving funding

Sustainability, DEI, and Human Capital Development

VC and PE investors actively support DEI and sustainability initiatives,. They also facilitate educational/training initiatives and events, facilitating knowledge transfer and human capital development.

4. Impact of VC and PE Investments on Company Outcomes

Assessment of Impact on Company Outcomes

To assess the impact of VC and PE funding on company performance, outcomes of VC and PE backed companies were compared to outcomes of statistically similar companies who did not receive any funding. Below is an overview of key steps involved in this assessment:

Step 1: Collection of historical financial data for VC and PE backed companies in Quebec.

Step 2: Identification of a set of companies that have not received funding for comparative analysis.

Step 3: Use of advanced statistical analysis to match companies identified in Steps 1 and 2 based on key financial indicators, company characteristics, and industry of operation.

Step 4: Use of statistical and econometric analysis to conduct a comparative analysis of company outcomes. In certain cases, sufficient data was not available to conduct a comparative assessment, specifically for innovation and productivity. In such cases, company performance was assessed over time to identify key outcomes.

Please see **Appendix D** for further details regarding the methodology employed for this assessment.

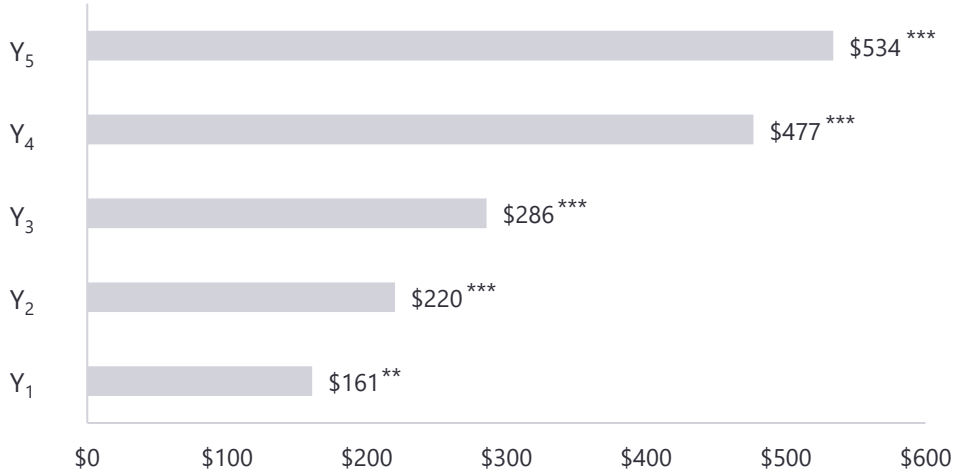
4. Impact of VC and PE Investments on Company Outcomes

Company Revenues Rise After Funding

Analysis of VC and PE Funded Companies

- Econometric analysis suggests that VC and PE funding has a positive and statistically significant impact on company performance compared to pre-funding years

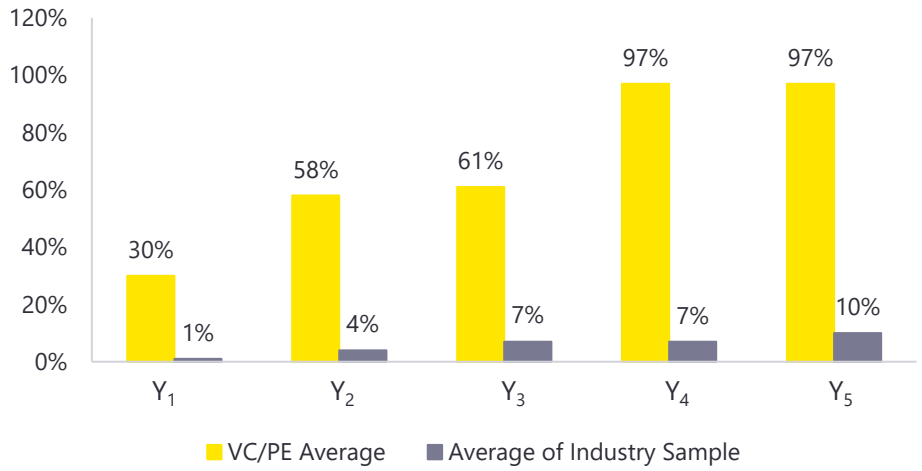
Regression Results – Company Revenues
(in $M)



Comparison to Industry Sample

- On average, VC and PE backed companies experience higher growth in revenues than their non-funded counterparts
- Differences in growth are statistically significant between years Y_1 and Y_3

Comparison of Funded and Non-Funded Companies
Cumulative Growth in Revenues (in %)



Y_0 = Year of funding

Confidence Levels: *** 0.001, ** 0.05, * 0.1
The beta estimators presented above are based on a fixed-effects regression model, which controls for time-invariant characteristics of companies to allow for the measurement of company outcomes realized after funding.

Sources: Réseau Capital, Statistics Canada, Federal Reserve Economic Data, PitchBook, Capital IQ and EY Analysis.
Notes: All figures assessed are in real 2023 Canadian Dollars; Distinct sample selection across models is necessary due to unique data requirements; Publicly-listed companies with no VC/PE origin were excluded from the assessment.

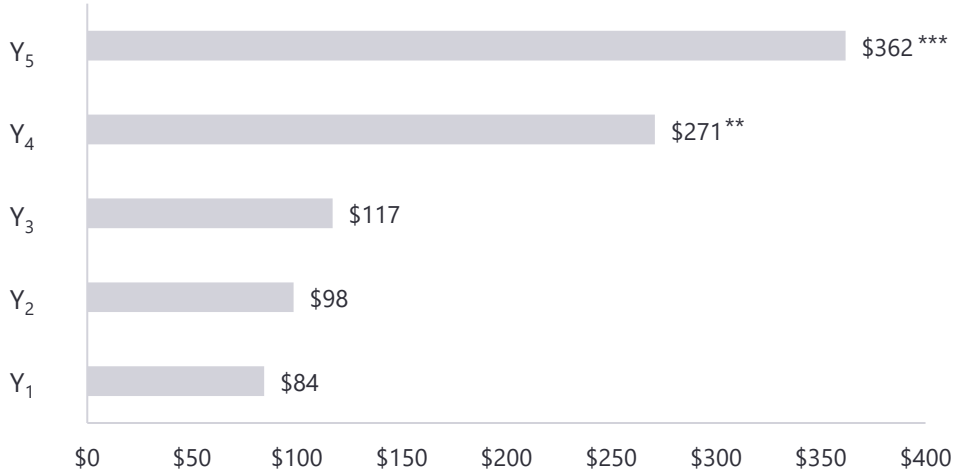
4. Impact of VC and PE Investments on Company Outcomes

Companies Report Higher Profits After Funding

Analysis of VC and PE Funded Companies

- Econometric analysis suggests that VC and PE funding has a positive impact on company profitability
- Effects are statistically significant during years Y_4 and Y_5

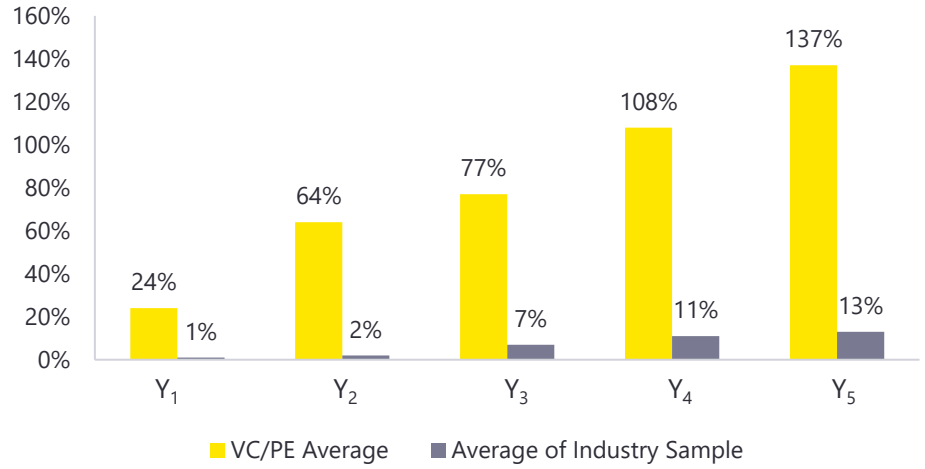
Regression Results – Company Profits
(in $M)



Comparison to Industry Sample

- On average, VC and PE backed companies experience higher growth in gross profits than their non-funded counterparts
- Differences in growth are statistically significant after year Y_1

Comparison of Funded and Non-Funded Companies
Cumulative Growth in Gross Profits (in %)



Y_0 = Year of funding

Confidence Levels: *** 0.001, ** 0.05, * 0.1
The beta estimators presented above are based on a fixed-effects regression model, which controls for time-invariant characteristics of companies to allow for the measurement of company outcomes realized after funding.

Sources: Réseau Capital, Statistics Canada, Federal Reserve Economic Data, PitchBook, Capital IQ and EY Analysis.
Notes: All figures assessed are in real 2023 Canadian Dollars; Distinct sample selection across models is necessary due to unique data requirements; Publicly-listed companies with no VC/PE origin were excluded from the assessment.

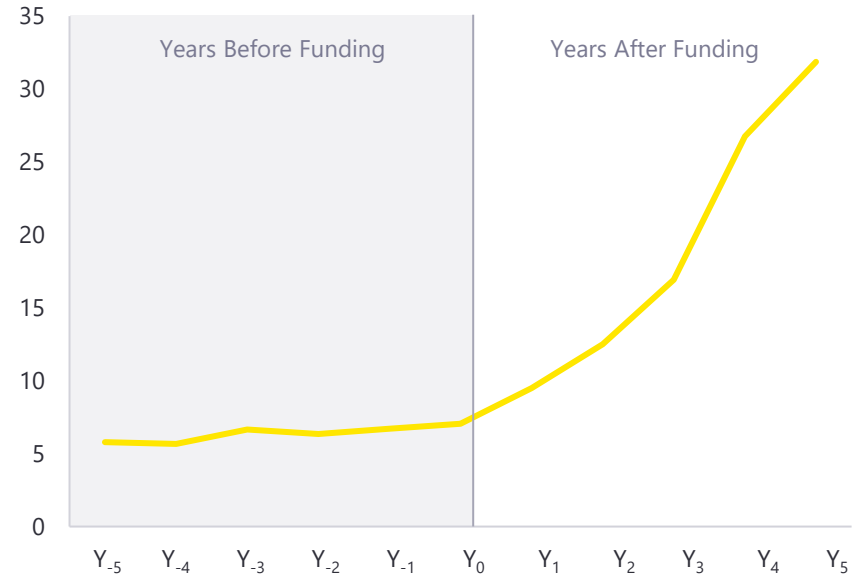
4. Impact of VC and PE Investments on Company Outcomes

VC and PE Backed Companies Drive Innovation

Econometric analysis suggests that increases in R&D spending after VC and PE funding are statistically significant compared to trends in pre-funding years during years Y_4 and Y_5.

Regression Results – R&D Spending
(in $M)

R&D Spending per Company
(in $M)



Y_0 = Year of funding

Confidence Levels: *** 0.001, ** 0.05, * 0.1
The beta estimators presented above are based on a fixed-effects regression model, which controls for time-invariant characteristics of companies to allow for the measurement of company outcomes realized after funding.

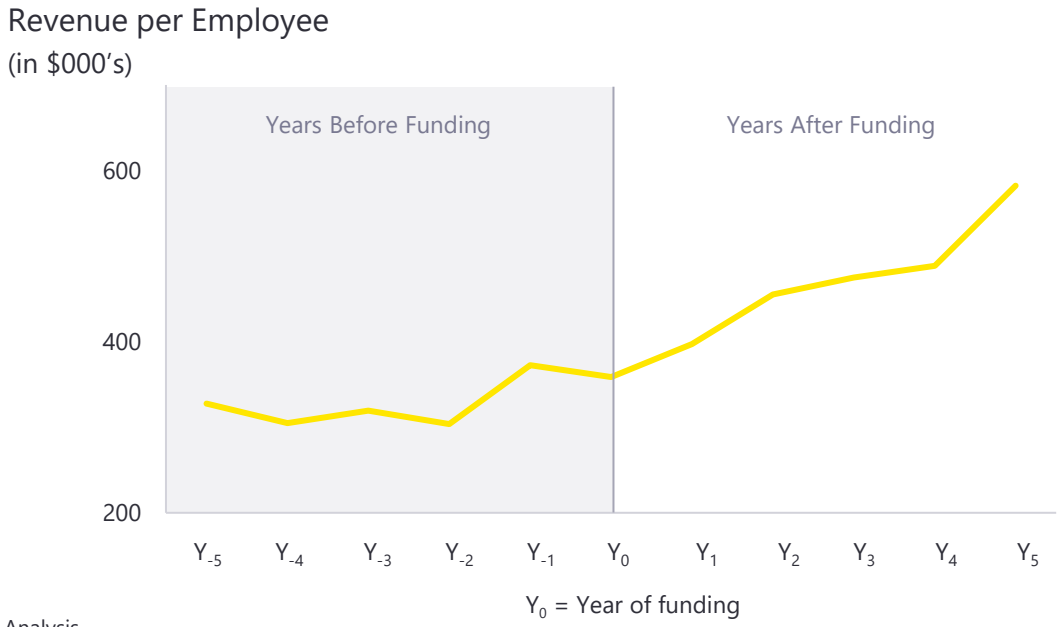
Sources: Réseau Capital, Statistics Canada, Federal Reserve Economic Data, PitchBook, Capital IQ and EY Analysis.
Notes: All figures assessed are in real 2023 Canadian Dollars; Distinct sample selection across models is necessary due to unique data requirements; Publicly-listed companies with no VC/PE origin were excluded from the assessment.

4. Impact of VC and PE Investments on Company Outcomes

Companies Achieve Higher Productivity After Funding

Labour productivity serves as a key indicator of how effectively funded companies utilize human capital to generate revenues, providing insights into operational efficiency, return on investment, and potential for future growth.

- Revenue per employee showcases an increasing rate of growth in the years following funding.
- Increases in labour productivity showcase an increasing trend over time. This is potentially due to the time taken to implement changes through investments in R&D, innovation, or other strategic changes. Examples may include the time taken to commercialize new Intellectual Property (IP), adoption of new technologies, and deployment of new systems and processes.



Sources: Réseau Capital, Statistics Canada, PitchBook, and EY Analysis.
Notes: All figures assessed are in real 2023 Canadian Dollars; Publicly-listed companies with no VC/PE origin were excluded from the assessment.

5. Broader Socioeconomic Footprint of the VC and PE Industry

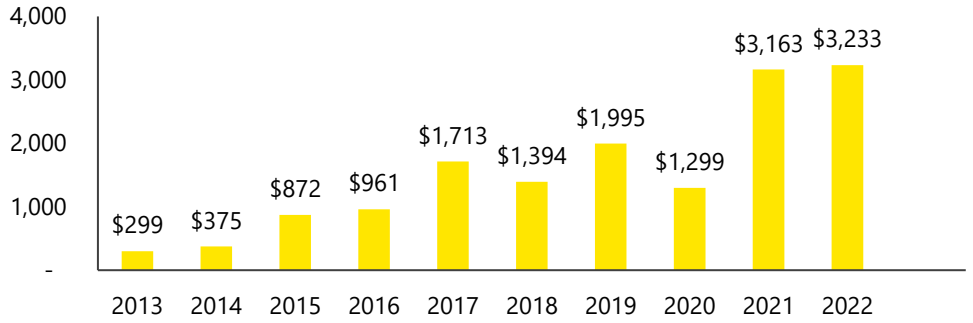
VC and PE Investments Support Environmental Outcomes

Investments by VC and PE investors in renewable energy and clean technologies in Quebec have increased over time, owing to the rise in importance of sustainable finance.

- Several VC and PE investors actively address climate change concerns by endorsing and support carbon emission reduction technologies.
- An evolution investment strategies among VC and PE investors can be observed, as companies continue to align their decisions with sustainable finance considerations.

VC Investment in Clean Technology Sector (in $M)

2013 – Q3 2022



Case Studies: Supporting Environmental Sustainability

Fondaction

For over 25 years, Fondaction has been a driving force in Québec's sustainable finance sector, supporting projects that align with Environmental, Social, and Governance (ESG) criteria and advance the Sustainable Development Goals (SDGs) for real environmental impact. Below is an overview of key impacts of Fondaction's activities:

- Management of specialized funds in fields such as energy efficiency, soil conservation and circular economy.
- Zero stock holdings in companies with fossil energy reserves, affirming their commitment to a clean-energy future.

Cycle Capital Investissement

Cycle Capital, a leading climate-tech VC in Canada, plays a pivotal role in impact investing through investment and support in scaling up innovative companies. Their investments aim to enable the transition to a net zero economy. As such, the fund focuses on technologies that allow for significant reductions in greenhouse gas (GHG) emissions, achieve energy savings, improve resource use, and industrial processes towards more sustainable practices.

- Since the creation of its fund IV, **76 kt CO2e** are estimated to have been avoided through the investment in the technologies implemented by the portfolio companies.
- All investees have a strong environmental stance and contribute to at least one Sustainable Development Goal.
- 63% of portfolio companies in their Fund IV had at least one woman on their board and 75% had at least one woman in leadership roles.

Note: ktCO2e stands for kilotonnes (kt) of carbon dioxide (CO2) equivalent (e).
Sources: Réseau Capital, Cycle Capital, Fondaction

5. Broader Socioeconomic Footprint of the VC and PE Industry

VC and PE Investors Actively Supports Diversity, Equity and Inclusion

DEI initiatives are known to address disparities in the workplace, thereby creating a fair and inclusive environment for all employees.

- Studies show that gender diversity, with more women in senior roles, improves returns and stabilizes portfolios.[1]
- Réseau Capital advocates for diversity in Quebec's business and investment sector, showcased in the Capital Femmes study.[2]

Women in Quebec's VC/PE Sector (2022)[2]

$2.9 B
invested in female-owned or female-led companies

65%
of surveyed firms have at least one female partner

25%
of all partners in the surveyed firms are female

Case Study: Supporting Gender Diversity in Technology

ACCELIA CAPITAL

Founded in 2021, Accelia Capital is a venture fund that backs high-impact tech companies run by women in Québec. The fund aims to improve diversity by directing 70% of its funds to enterprises led or owned by women.

With backing from twenty leading businesswomen and numerous institutional investors, Accelia Capital aims to reduce the gender disparity in VC investments and enhance female leadership within the tech sector.

Sources: Réseau Capital, Accelia Capital
[1]European women in VC. (2023). Achieving Superior Returns with Gender Diversity in European Venture Capital Firms: Highlighting the impact of gender mix on fund performance and closing the gender gap in European VCs.
[2]Réseau Capital, Capital femmes analysis, November 2023

5. Broader Socioeconomic Footprint of the VC and PE Industry

VC and PE Investors Support the Innovation Ecosystem

VC and PE investors play an instrumental role in in fostering innovation and growth within the entrepreneurial ecosystem:

- VC and PE investors enhance the entrepreneurial landscape through strategic guidance, networking opportunities, and educational events promoting hands-on learning, thereby increasing likelihood of investment in R&D and innovation.
- In the US for instance, VC backed companies account for nearly half (41%) of total US market capitalization, and 62% of US public companies' R&D spending.[1]

Such benefits can be expected to have long-lasting impacts through IP generation and commercialization, and a drive for follow-on innovation activity.

Case Studies: Supporting the Innovators of Tomorrow

Inovia Capital, with US$2.2B under management and a presence across North America and Europe, is a venture firm that supports founders from pre-seed to Initial Public Offering (IPO) and beyond. Renowned for backing global tech champions like Lightspeed and Hopper, Inovia provides capital, mentorship, and tactical support, thanks to:

- A vast network of experts and advisors in North America and Europe.
- The operator-led mindset and expertise of its team members having built iconic tech companies.

Amplitude is a full-stack venture capital firm that applies an evidence-based approach to investing globally in leading precision medicine companies. With over $500M under management and team located in the most innovative life sciences clusters, Amplitude leverages a unique growth model that accelerates company growth to breakout potential.

- Pre-Amp, a venture studio powered by Amplitude is ideating and creating groundbreaking companies.
- Fellowship Program integrates exceptional scientific and entrepreneurial talent with the experienced investment team and capital resources of Amplitude Ventures.

Sources: Réseau Capital, Inovia, Amplitude
[1] Gornall, W & Strebulaev, (2021) The Economic Impact of Venture Capital: Evidence from Public Companies.

5. Broader Socioeconomic Footprint of the VC and PE Industry

VC and PE Investors Support Productivity and Performance

VC and PE investments extend beyond capital provisions, serving as key contributors to the operational improvement and market expansion of the companies they fund.

- VC and PE investments enhance firm productivity through improved management, active monitoring, and strategic capital investments.[1,2]
- PE facilitates investment in physical assets, promoting long-term economic growth and facilitating effective international expansion.[1]
- Firms with PE backing can be more likely to embark on export activities, through access to increased knowledge, innovation, and expertise.[3]

Case Studies: Supporting Company Success

NOVACAP

Founded in 1981, Novacap is a leading North American private equity firm with over C$8B of AUM that has invested in more than 100 platform companies and completed more than 150 add-on acquisitions. Applying its sector-focused approach since 2007 in Industries, TMT, Financial Services, and Digital Infrastructure, Novacap's deep domain expertise can accelerate company growth and create long-term value.

The firm's excellence in promoting expansion and success was recently acknowledged by the **2023 CVCA PE Regional Impact Award** (Central Canada). Novacap reinforces its strategic investments with a proactive stance on cybersecurity, assuring that acquisitions are grounded on solid digital defences, safeguarding and equipping companies for future challenges.

FONDS de solidarité FTQ

Since 1983, the Fonds de solidarité FTQ has been integral to Québec's economic resilience, amassing net assets of $18.9 billion and fostering over 3,700 company partnerships. With support from over 769,000+ savers, this development capital fund directs Quebecers' savings into diverse economic sectors, bolstering job creation and regional development.

The Fonds prioritizes innovation, economic progress, worker education, and retirement planning. Beyond providing unsecured financing with flexible terms, the Fonds distinguishes itself by offering strategic expertise and fostering strong business relationships, driving both economic and social value across Québec.

Sources: Réseau Capital, Inovia, Amplitude
[1] European Private Equity and Venture Capital Association (EVCA) (2013). Exploring the impact of private equity on economic growth in Europe. [2] Lockett, A. et al., 2008. The export intensity of venture capital backed companies.
[3] Lavery, P. & Wilson, N. (2022). The impact of private equity on exporting activity.

Appendix

Appendix A: Economic Impact Assessment Methodology

Estimation of Industry Activity

To conduct the economic impact assessment, EY estimated the economic value of the activities of VC and PE backed companies. Below is an overview of key steps in this assessment:

- List of VC and PE Backed Companies: The analysis is based on data for VC and PE backed companies provided by Réseau Capital and covers a set of companies that received investment from 2013 to 2022. This does not include publicly-listed companies that received a private placement, with the exception of those involved in mineral exploration and mining activities.
- Collection of Financial Data: Due to limited availability of company-level financial information at the time of analysis, 2022 is used as the reference year for the economic impact assessment. Historical financial information (i.e. annual operational and capital expenditures) for all VC and PE backed companies was sourced from PitchBook for the year 2022. It is important to note that in several cases, complete historical financial data was not available for VC and PE backed companies.
- Filtering to Retain Companies with Active Investment: The dataset was filtered to remove any companies from which VC and PE investments had been divested. Using PitchBook data, EY also excluded from the analysis any companies that were no longer in business, were not listed in PitchBook, or had declared bankruptcy.
- Estimation of Quebec-based Activity: Through a detailed review of financial and operational data for all selected companies, EY estimated the share of business activity that would be taking place in the Province of Quebec. Expenditure estimates for companies with available financial data were then extrapolated to the full sample of companies in the VC and PE industry.
- Mapping of Business Activity to Key Industries: To support the assessment, each company was mapped to its corresponding industry code under the North American Industry Classification System (NAICS). This industry mapping allowed for the allocation of company spending to key industries in EY's proprietary I-O model.

The analysis conducted for this study is restricted by data available from third party sources (such as PitchBook). The magnitude and significance of statistical results provided in this report may be subject to change, if further data and information becomes available (e.g. through direct company surveys, etc.).

Appendix B: Technical Notes (Economic Impact Assessment)

Input-Output Model – Assumptions and Restrictions

The following section outlines the assumptions and restrictions associated with the I-O model used to perform the economic impact assessment in the Report. The I-O model is subject to limitations both in concept and implementation. Like any economic model, the I-O model is conceptually an abstraction that attempts to be complex enough to accurately capture and estimate the most significant impacts to the real-life economy caused by economic activities, yet simple enough to be analytically and intuitively meaningful.

An I-O model reflects the observed interdependency between all sectors of the economy. For Canada, Statistics Canada reports on the 236 industrial sectors in the economy: (1) how each sector relies on the other 235 sectors for inputs to their production; and (2) how each sector supplies its products and services to each of the remaining 235 sectors. While an I-O model provides a consistent and innovative way of measuring the economic effects of an economic activity, one should be aware of the assumptions and limitations of the model's underlying approach. Some of these assumptions include:

- The relationship between industry inputs and outputs is linear and fixed, meaning that a change in demand for the outputs of any industry will result in a proportional change in production.
- The model assumes constant returns to scale, and cannot account for economies/diseconomies of scale or structural changes in production technologies; an assumption that does not necessarily hold in the actual economy.
- Prices are fixed in the model; thus, the model is unable to account for elasticities, (how one economic variable changes in response to another).
- I-O models are static, and therefore do not consider the amount of time required for changes to happen. Changing the timeframe would not affect the magnitude of the estimates.
- There are no capacity constraints, and all industries are operating at full capacity. This implies that an increase in output results in an increase in demand for labour (rather than simply re-deploying existing labour). It also implies that there is no displacement that may occur in existing industries as new projects complete.
- I-O models assume that the technology and resource mix (ratios for inputs and production) is the same for all firms within each industry, i.e. the 236 industry categories reported in Statistics Canada's input-output table. As such, the analysis describes industry average effects.
- The model assumes that the structure of the economy remains unchanged, and any structural changes in the economy since 2019 will therefore lead to changes to the multipliers, which could be implemented once Statistics Canada release updated input-output tables. As such, the further the year of analysis is away from the year of the input-output tables used, the greater the uncertainties.

Appendix B: Technical Notes (Economic Impact Assessment)

Input-Output Model – Assumptions and Restrictions (continued)

- The model does not consider the economic impacts or opportunity costs associated with using resources elsewhere. Using these funds for alternative uses would generate their own economic impacts, which could potentially be larger or smaller. However, the model will not be able to capture this difference.
- Results from the I-O model should not be interpreted as causal impacts, that is, users should not take the economic impacts presented in this report at verbatim. It cannot be said with certainty that X dollars of capital or operational spending will produce X number of FTEs or have an X amount of impact on GDP.
- The model does not consider substitutions amongst inputs, and each industry in the model is regarded as having a single production process.

Per the assumptions above, the structure and limitations of I-O models lend themselves to measuring the impacts of projects that are shorter term in nature. Generally, they are used to look at shocks to the economy.

Appendix C: Economic Impact Results

Below is an overview of economic impact results of PE-backed companies.

Economic Impacts of PE Backed Companies (2022)

Total Economic Impacts	GDP ($M)	Labour Income ($M)	Jobs (FTEs)
Direct	17,348	9,725	214,719
Indirect	7,105	4,335	75,247
Induced	5,540	2,249	56,233
Total	**29,993**	**16,309**	**346,199**

Appendix C: Economic Impact Results

Below is an overview of economic impact results of VC-backed companies.

Economic Impacts of VC Backed Companies (2022)

Total Economic Impacts	GDP ($M)	Labour Income ($M)	Jobs (FTEs)
Direct	9,045	7,232	109,676
Indirect	3,196	2,169	35,186
Induced	2,852	1,538	28,952
Total	**15,093**	**10,939**	**173,814**

Appendix D: Technical Notes (1)

Statistical & Econometric Analysis

Overview of Econometric Model

- The model selected for analysis is an entity-level fixed effects econometric model. This type of model is widely utilized in econometrics when the aim of analysis is to understand and control for individual-specific time-invariant characteristics of entities and their effects on the outcome variables under consideration.
- The central aim for this analysis is, subject to data gaps and limitations, to identify the effect, in terms of increased profits and revenues, that can be attributed to VC and PE funding. Throughout the analysis, VC and PE funding was considered as the 'treatment' for the model.
- Due to the processes of selection of companies to receive funding, challenges may arise due to the presence of selection bias, which in this context refers to the high likelihood that companies receiving funding may have implicitly more attractive fundamental characteristics than companies who did not receive funding.
- The selection of an entity-level fixed-effects model allows to control for such characteristics, as it assumes that for any entity in the data which has multiple observations over time, their fundamental characteristics remain constant. This allows for due consideration to be given to outcomes that are influenced by these unobservable characteristics.
- The benefit of using a fixed-effects model to understand the average treatment of treated groups relies on the ability to interpret on average what proportion of the outcomes are realized due to the introduction of treatment, and which proportion is realized due to time-invariant characteristics.
- Additional controls, such as the consideration of inflationary effects as well as the effects of the COVID-19 pandemic on company financials, were added to the analysis to support the isolated identification of treatment effects.
- Data considered for analysis is unbalanced in nature, as not all companies considered for analysis have complete financial information for all years. The model uses all available information for each treated entity and the individual effects are used to construct the average treatment effect. Companies considered for analysis are those which (1) have at least two time periods available for consideration, and (2) at least one time period was before or at treatment, and at least one period was post-treatment.
- The sample selected for this model is unique and independent from the sample used to conduct the statistical analysis to compare with the industry sample. Publicly-listed companies with no VC/PE origin were excluded from the assessment.

Appendix D: Technical Notes (2)

Statistical & Econometric Analysis

Statistical Analysis to Compare with Industry Sample

- In econometric analysis, difference-in-difference analysis is useful when assessing the effects of a treatment (i.e., VC and PE funding) is on an outcome (i.e., profits and revenues). The methodology relies on the identification of a reliable counterfactual group, or group with similar characteristics to the treatment group which only differ by the introduction of treatment.
- Given that VC and PE funding is subject to a selection process, there does not exist a natural counterfactual to the treatment groups. To identify an appropriate counterfactual to support the assessment, Propensity Score Matching (PSM) was employed as the statistical matching technique.
- PSM is widely used in statistics that utilizes a logistic regression model to estimate the probability of receiving treatment (i.e., the propensity score) based on a set of observed characteristics over time. By using PSM, a counterfactual group is created with similar propensity scores and characteristics to the set of treated entities. Subject to the availability of data, the groups of entities selected in the counterfactual group are the ones which, within the scope of statistics, most closely resemble the set of entities present in the treatment group.
- Below is an overview of key stages in this sampling analysis:
  - Step 1: A set of financial and non-financial characteristics were identified for each company with VC and PE funding (i.e. the treatment group). These characteristics include revenues, operating expenses, gross profits, EBITDA, and industry type (as classified by the NAICS). This exercise was repeated for companies that did not receive any funding (i.e. the counterfactual group).
  - Step 2: The statistical analysis then involved the estimation of a logistic regression for each company to estimate its probability of being selected into the treatment group, i.e. the propensity score. This exercise was completed for both the treatment and counterfactual groups.
  - Step 3: Each company in the treatment group was then matched to a company in the counterfactual group based on similarity in propensity scores. This matching helps to control for differences in the specified characteristics in Step 1, ensuring that the analysis is conducted against companies that have comparable financial performance and industry structure.
- The sample selected for this model is unique and independent from the sample used to conduct the fixed-effects econometric analysis. Publicly-listed companies with no VC/PE origin were excluded from the assessment.