

>runQL

CxC Datathon 2025 RunQL Report

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1. INTRODUCTION

This report provides an in-depth analysis of **Canadian tech investments from 2019 to 2024**, leveraging data from RunQL to uncover key funding trends, investor behaviour, and sectoral and regional dynamics.

The accompanying interactive dashboard presents a comprehensive view of these insights, offering actionable recommendations for startups and investors.

The analysis explores multiple dimensions of the investment landscape:

1. **Investment Trends Over Time**
2. **Funding Stages Analysis**
3. **Investor Demographics & Behaviour**
4. **Sectoral & Regional Insights**
5. **Predictive & Prescriptive Insights**

To support this analysis, data imputation and processing techniques were applied to clean missing values, estimate missing investment details, and ensure data integrity.

Advanced visualization tools and an interactive dashboard were built using **Scikit-Learn** (forecasting), **Streamlit**, and **Plotly**, enabling seamless exploration of investment trends.

This **report and dashboard** provide data-driven insights into Canada's evolving startup ecosystem, offering valuable perspectives for entrepreneurs, investors, and policymakers navigating the future of tech funding.

Data Acquisition



Exploratory Data Analysis (EDA)



Data Preprocessing



Modeling

- ‘briefedin’ database
 - companies
 - deals
 - investors
 - deallInvestor
 - ecosystems

- load data
- analyze features
- identify missing values

- handle missing data
- assign data sets
 - training set
 - test set

- create forecasting models

2. DATA EXPLORATION & METHODOLOGY

2.1 Dataset Overview

The structured raw data on tech investments in Canadian startups from 2019 to 2024 made up the dataset used for this analysis.

Numerous startup funding-related characteristics are included in the dataset, including funding amounts, deal sizes, investment firms, startup industries, funding stages, and regional details.

With the support of such data, Canada's investment landscape may be thoroughly examined, enabling the identification of trends, investor behaviours, and sectoral performance.

The dataset was accessed through RunQL's Canadian Tech Investment Challenge, and initial inspection revealed a well-organized structure with key columns such as:

- **date** – The timestamp when the deal occurred.
- **amount** – The total investment amount in the deal.
- **roundType** – The funding stage (Pre-Seed, Seed, Series A/B/C, etc.).
- **primaryTag** – The sector in which the startup operates (e.g., AI, SaaS, FinTech).
- **investorCountry** – The country of the investing firm (Canada, US, International).

2.2 Data Cleaning & Preprocessing

To ensure data quality and consistency, multiple data cleaning steps were applied:

1. Handling Missing & Invalid Values

- Columns with a majority of missing values like secondaryEcosystem were removed.
- Date parsing issues were corrected.
- Outliers were checked to identify possible data entry errors.

2. Data Aggregation for Trend Analysis

- Investments were grouped by years and quarters to observe long-term trends.
- Data was aggregated by funding stage to analyze deal distribution.
- Sectoral funding trends were extracted by grouping by primaryTag.
- Investor behaviour was examined by analyzing investments by investorCountry.

3. Handling Duplicates & Interpolating Missing Data

- Duplicate investment records were removed to avoid inflating deal counts.
- Interpolation was applied to fill missing values in time-series data (for better trend modeling).
- Web Scraping was used to impute missing values.
- Very few missing data points were manually filled.

2.3 Analytical Approach & Methodology

To analyze and forecast investment trends, a combination of descriptive statistics, time series modeling, and predictive analytics was used:

1. Exploratory Data Analysis (EDA)

- Summary statistics (mean, median, variance) were computed for funding sizes.
- Visualizations (bar charts, line plots, heatmaps) were used to identify patterns.

2. Time-Series Modeling for Investment Trends

- ARIMA models were applied to forecast total investment volume from 2025-2028 based on historical trends.
- Linear regression was used for sectors with limited historical data.

3. Sectoral Analysis & CAGR Calculation

- The Compound Annual Growth Rate (CAGR) was calculated for each sector to determine high-growth areas.

4. Regional & Investor Analysis

- The dataset was segmented by geography to examine differences in investment patterns across cities (Toronto, Vancouver, Montreal, etc.).
- Investor behaviour was compared by country to assess domestic vs. international participation.

2.4 Tools & Technologies Used

- **Python (Pandas, NumPy)** – Data cleaning, manipulation, and statistical analysis.
- **Matplotlib & Seaborn** – Visualization of trends and investment patterns.
- **Statsmodels (ARIMA)** – Time-series forecasting for investment predictions.
- **Scikit-learn** – Regression modeling for investor and sectoral insights.
- **Jupyter Notebook** – Interactive analysis and visualization.

2.5 Limitations & Considerations

While the dataset provides extensive coverage of Canadian tech investments, certain limitations must be noted:

- **Missing Data** – Some deals lack complete funding information, requiring interpolation.
- **External Market Factors** – Broader economic conditions (inflation, interest rates) are not included but could impact investment trends.
- **Sector Classification** – Some startups operate in multiple sectors, making sectoral classification complex.
 - To address this, sector classifications were standardized based on the primary sector associated with each startup.
 - For better flexibility in visualizations, the number of sectors displayed was made adjustable, allowing users to filter and focus on specific industry trends.
- **Limited number of available records in certain categories** – Some trends could not be reliably analyzed or forecasted.
 - To mitigate this, interpolation and alternative statistical methods were considered where applicable.

3. INVESTMENT TRENDS OVER TIME

Based on the observed trends in investment growth, deal volume, and quarterly patterns, here are key insights and actionable recommendations.

3.1 Investment Trends Insights & Recommendations

Observed Trend:

- Investment peaked in 2021, followed by a steep decline. The forecast suggests stabilization post-2025 rather than a strong recovery.

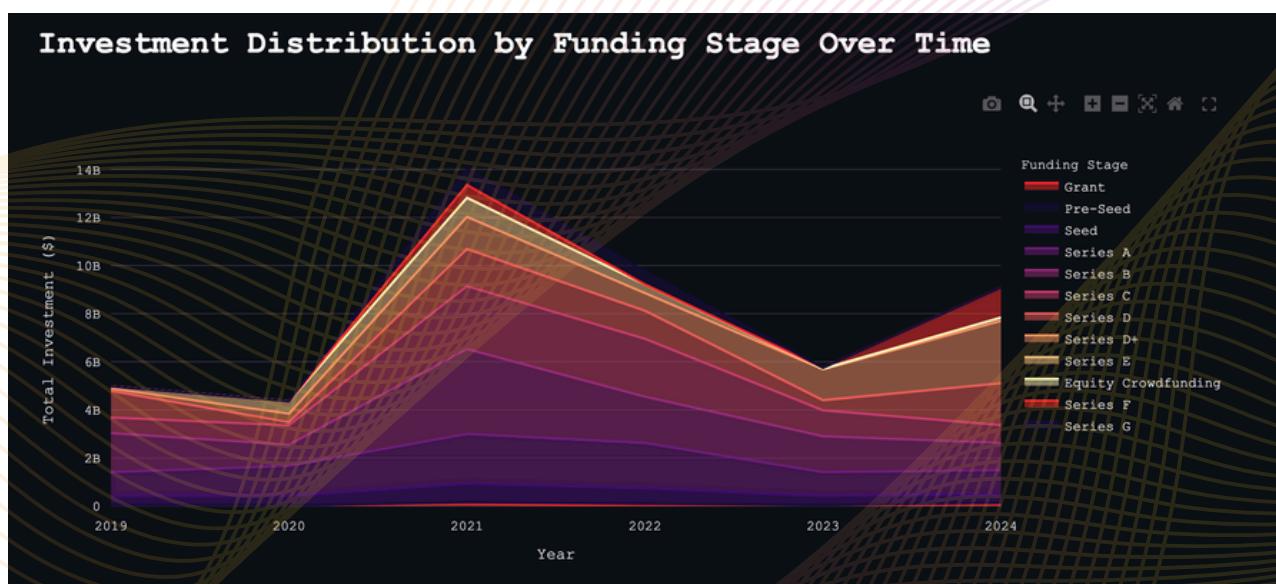
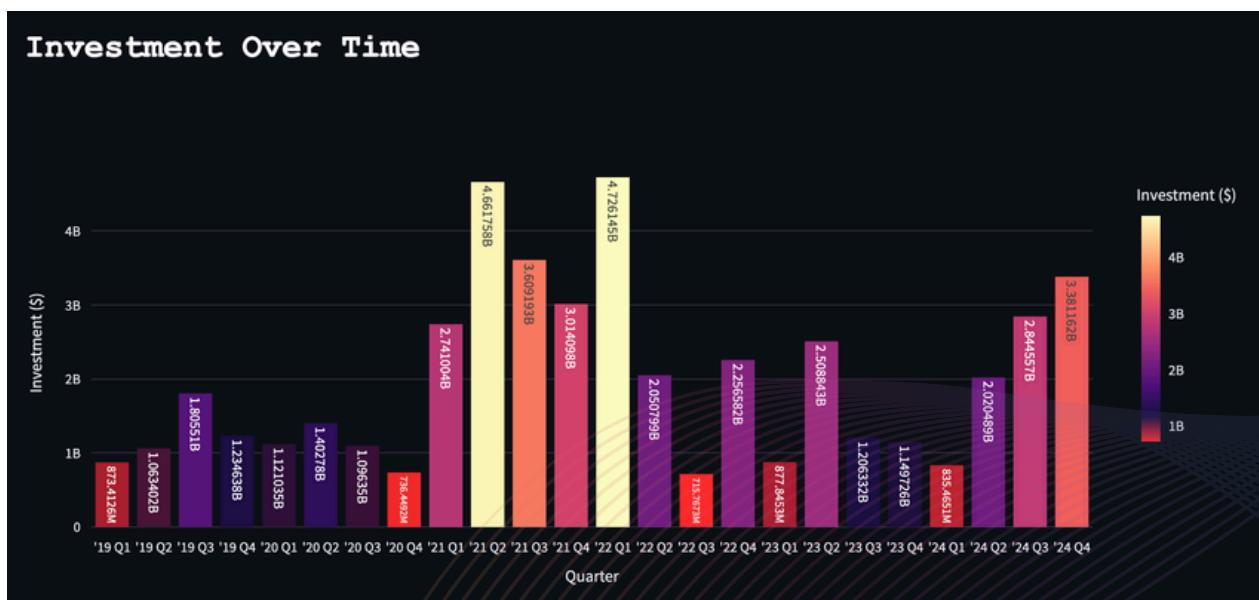
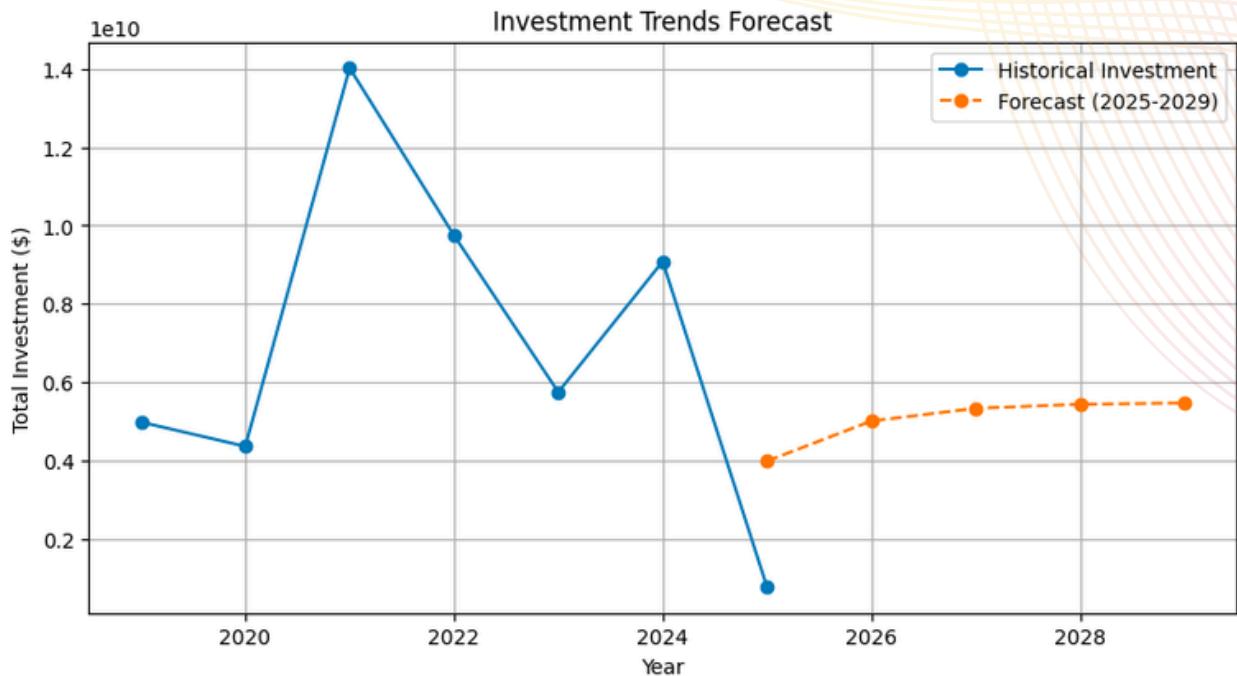
Possible Causes:

- A market correction after an over investment period, particularly following the post-pandemic funding surge.
- Macroeconomic factors such as inflation, rising interest rates, and tighter investment conditions.
- A shift in investor priorities toward profitability and sustainable business models rather than aggressive growth.

Implications:

- The decline in funding suggests that startups may need to focus more on operational efficiency and revenue generation rather than relying on continuous investment.
- Investors may be favouring later-stage companies with proven business models over early-stage startups.

See the next page and the *Investment Trends Dashboard* for visualizations.



3.2 For Investors: Best Time to Invest

1. Early-Stage Investing (Seed & Series A) During Market Recoveries

- Investors should look for early-stage startups when the market is recovering from downturns, as valuations are lower and growth potential is high.
- Historically, funding dips (e.g., 2023) have been followed by periods of increased investment activity. Entering at the start of these uptrends provides better returns.

2. Series B+ Investments in Stable or Growth Periods

- Once a startup reaches Series B or later, risk levels decrease, but competition for deals rises. Investors should target these stages when funding momentum is strong (e.g., during economic booms or tech adoption cycles).
- The best time to invest in late-stage startups is right before funding peaks, as post-peak investments can lead to overvalued positions.

3. Sector-Timing Approach

- Investors should follow sectoral trends rather than broad market cycles.
- If funding in AI, HealthTech, or ClimateTech is steadily increasing, investors should act early before valuations become too high.
- Conversely, if funding in a sector like Crypto is declining, investors should hold off unless there is clear innovation potential.

3.3 For Startups: When to Seek Funding for Optimal Terms

1. Leverage Market Uptrends for Higher Valuations

- The best time for startups to raise capital is during or right after funding rebounds (e.g., after a downturn like 2023).
- Investors tend to increase deal volume during these periods, leading to higher valuations and easier access to capital.

2. Secure Seed Funding in Periods of Strong Investor Confidence

- If early-stage investments are rising, startups should raise funds sooner rather than later, as competition for capital will grow.
- If investment volumes are declining, startups should focus on bootstrapping or grants until market confidence improves.

3. Avoid Fundraising in Market Contractions

- Raising Series A/B funding when deal volumes are shrinking (e.g., post-2021 decline) means investors will be more selective, offering lower valuations and stricter terms.
- If funding is declining, startups should extend their runway by cutting costs or securing non-dilutive funding.

4. Industry-Specific Fundraising Strategies

- Emerging sectors (AI, CleanTech, HealthTech) – Seek funding early before competition increases and valuations peak.
- Mature sectors (FinTech, SaaS) – Secure capital during periods of sustained investment growth to avoid being undervalued.

3.4 Overall

Final Takeaway

- Investors should deploy capital at the start of uptrends to maximize returns while avoiding peak valuations.
- Startups should raise funds when investment volumes are increasing and avoid downturns where capital becomes scarce.
- Both should focus on sector-specific timing, as funding trends differ across industries.

4. FUNDING STAGE ANALYSIS

Based on funding trends across different investment stages (Pre-Seed, Seed, Series A, B, and beyond), we analyze how investment distribution has changed and what it means for startups and investors.

4.1 Funding Stages Insights

Observed Trend:

- Early-stage funding (Pre-Seed & Seed) saw a decline after 2021, suggesting a more cautious investor approach.
- Later-stage funding (Series B & C+) has remained more stable, indicating a preference for mature startups with proven business models.
- Forecasts suggest moderate recovery for Series A/B investments post-2025, but Pre-Seed activity may remain suppressed.

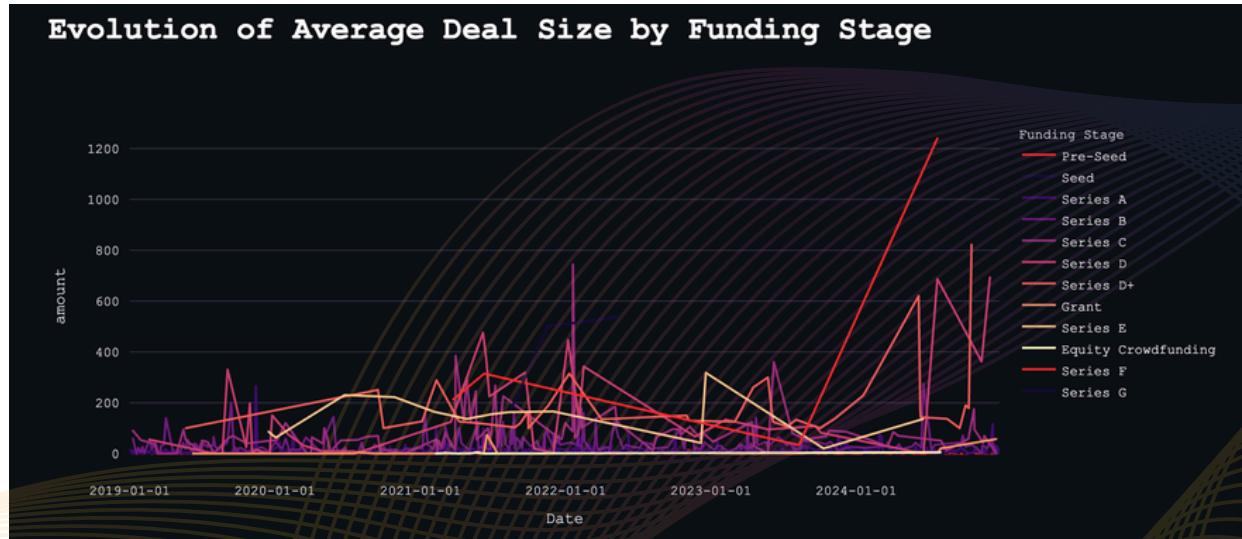
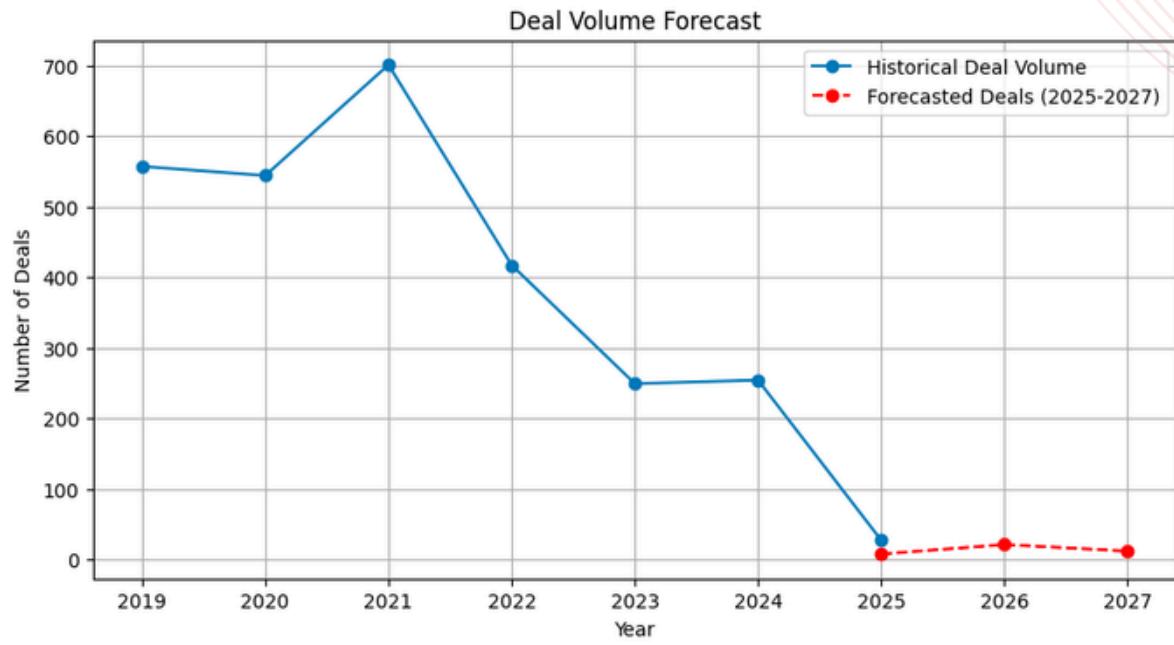
Possible Causes:

- Higher risk aversion – Investors may be prioritizing companies with clear revenue models rather than high-risk early-stage startups.
- Macroeconomic conditions – Rising interest rates and economic uncertainty have led investors to fund later-stage, more stable companies.
- Shift in startup funding strategy – More startups may be delaying fundraising or relying on alternative funding sources like bootstrapping or government grants.

Implications:

- Startups at earlier stages may struggle to secure funding, leading to longer validation periods before seeking investment.
- Series A and later-stage companies will likely receive more funding, but valuations may be more conservative.
- Investors may demand stronger traction and financials before committing to early-stage investments.

See the next page and the *Funding Stages Dashboard* for visualizations.



4.2 Recommendations

Recommendations Based on Observed Trends

1. Funding Size and Investment Strategy

- Investors: Given that large deals are forecasted to remain stable while small and mid-sized deals show minimal variation, investors should prioritize larger, late-stage investments where stability is observed.
- Startups: Early-stage startups should seek funding during high-growth periods (e.g., when there is an uptick in deal volume) to maximize valuation and investor interest. Pre-seed and seed-stage companies may need to diversify funding sources (grants, crowdfunding, accelerators).

2. Deal Volume Forecast and Market Timing

- Investors: The deal volume has declined sharply since 2021 and is forecasted to stabilize at lower levels post-2025. This suggests a conservative investment environment, meaning investors should focus on quality over quantity and seek companies with proven traction.
- Startups: With lower deal volumes, securing funding will be more competitive. Startups should optimize operational efficiency and demonstrate strong revenue potential to stand out.

3. Sectoral Funding Trends & Startup Positioning

- Investors: Sectors that have shown resilient funding trends (such as AI, CleanTech, and HealthTech) are safer long-term bets. Investors should diversify portfolios into these sectors, especially those with government incentives or growing regulatory support.
- Startups: Emerging sectors like climate tech, AI, and SaaS should leverage their momentum to attract funding. Companies in declining sectors should explore strategic pivots to align with investor priorities.

4. Evolution of Deal Size by Funding Stage

- Investors: The volatility in deal size across stages suggests that later-stage companies are seeing larger but more irregular investments. Investors should closely monitor macroeconomic trends to time funding rounds efficiently.
- Startups: For early-stage startups, timing is crucial. Companies raising Seed or Series A rounds should align fundraising efforts with economic recovery phases to secure favorable valuations.

5. Timing for Optimal Investment & Fundraising

- Investors: The best time to invest is when markets begin to show sustained recovery, rather than at the lowest funding points. Watching macroeconomic indicators such as interest rates and inflation will help time investments for maximum returns.
- Startups: The best time to seek funding is during a period of sectoral growth and increased deal volume. Startups should prepare funding rounds before economic recovery begins to capture early investor interest.

Final Takeaways

- Investors should focus on sectors with stable or growing investment trends and time their investments around market rebounds.
- Startups must position themselves strategically, emphasizing profitability and adaptability to changing investor priorities.
- The funding environment is more competitive, making timing and strategic positioning more critical than ever.

5. INVESTOR DEMOGRAPHICS & BEHAVIOUR

Based on the observed trends in investor behaviour here are key insights and actionable recommendations.

Key Trends:

- The majority of investment firms funding Canadian startups are based in the USA and Canada, with the USA leading.
- Canadian investors dominate early-stage deals, while US and international firms participate more actively in Series B and beyond.
- Larger deals are primarily backed by US and global investors, particularly in later funding rounds.

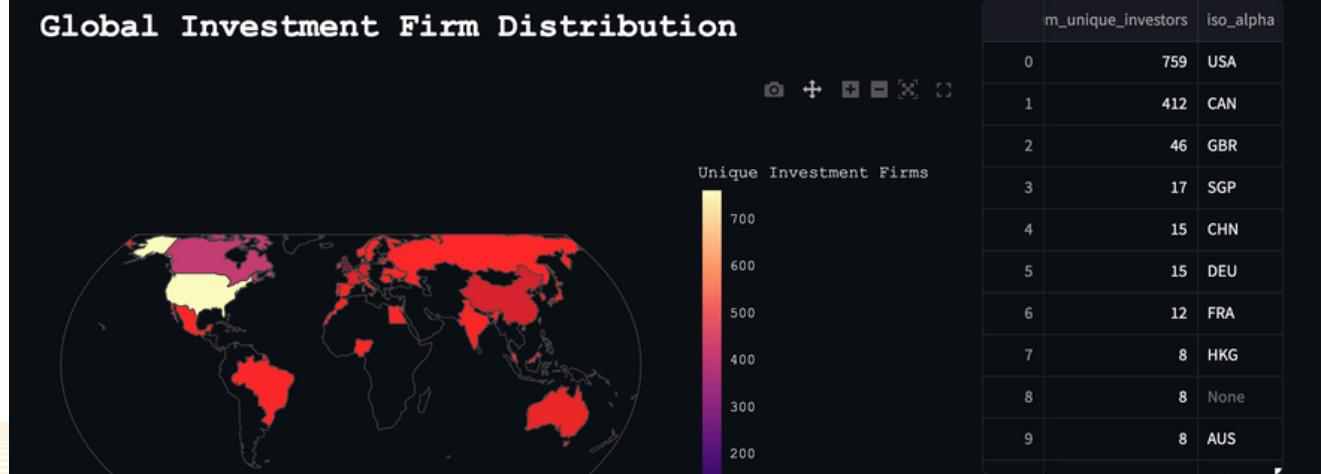
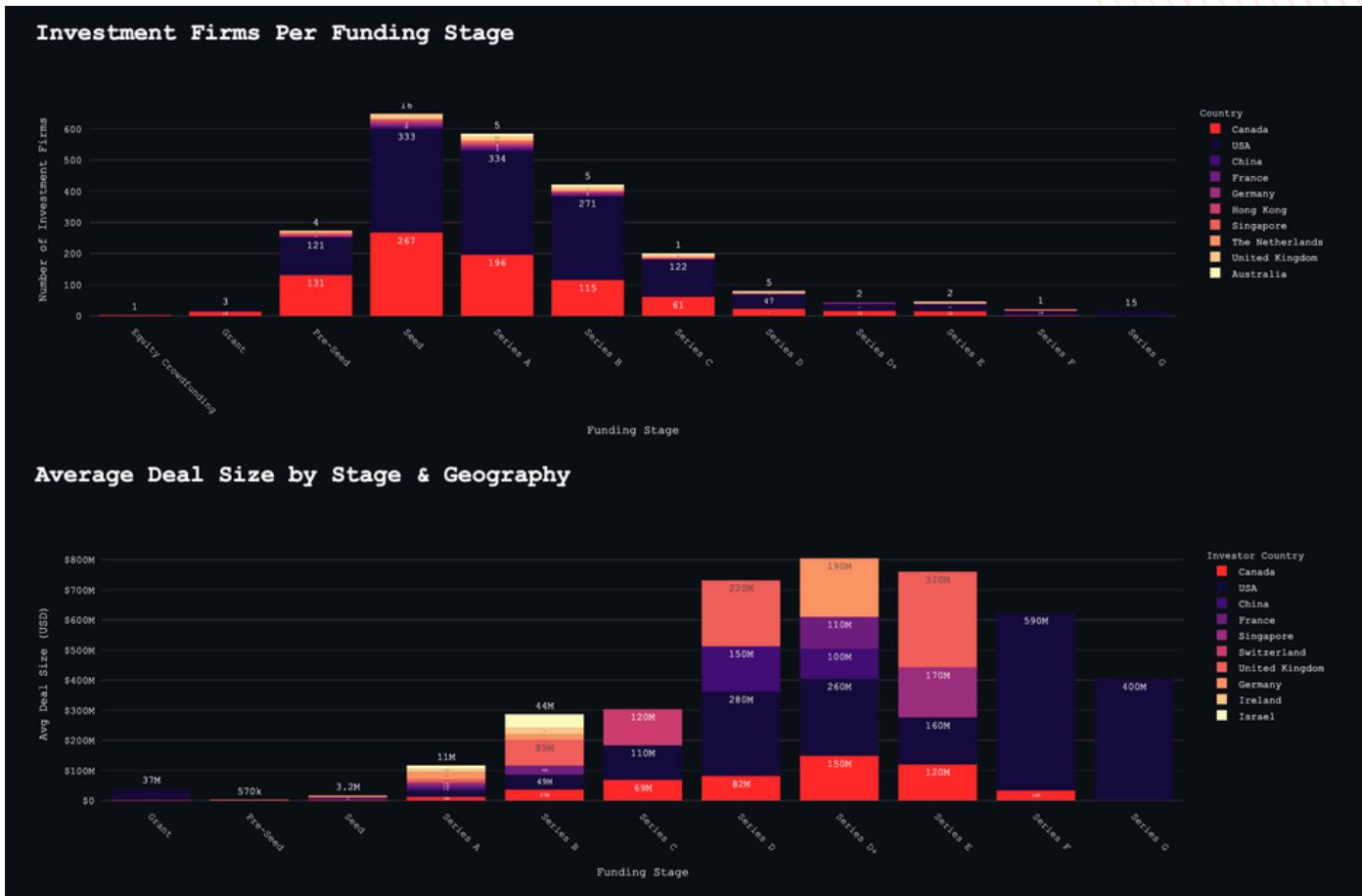
Implications:

- Canadian startups seeking early-stage funding may find more success with domestic investors, while later-stage startups should target international VCs.
- The strong presence of US investment firms suggests cross-border investment opportunities but may also indicate reliance on external capital.
- Regions with fewer investors may face challenges in securing large-scale funding, potentially affecting long-term growth.

Recommendations:

- Startups: In early stages, prioritize Canadian investors, but for growth and scaling, build relationships with US and international firms.
- Investors: Canadian firms should consider increasing later-stage funding to retain high-potential startups rather than losing them to foreign investors.
- Policymakers: Encourage initiatives that attract more domestic and international VC participation across all funding stages to create a more balanced investment ecosystem.

See the next page and the *Investor Demographics* for visualizations.

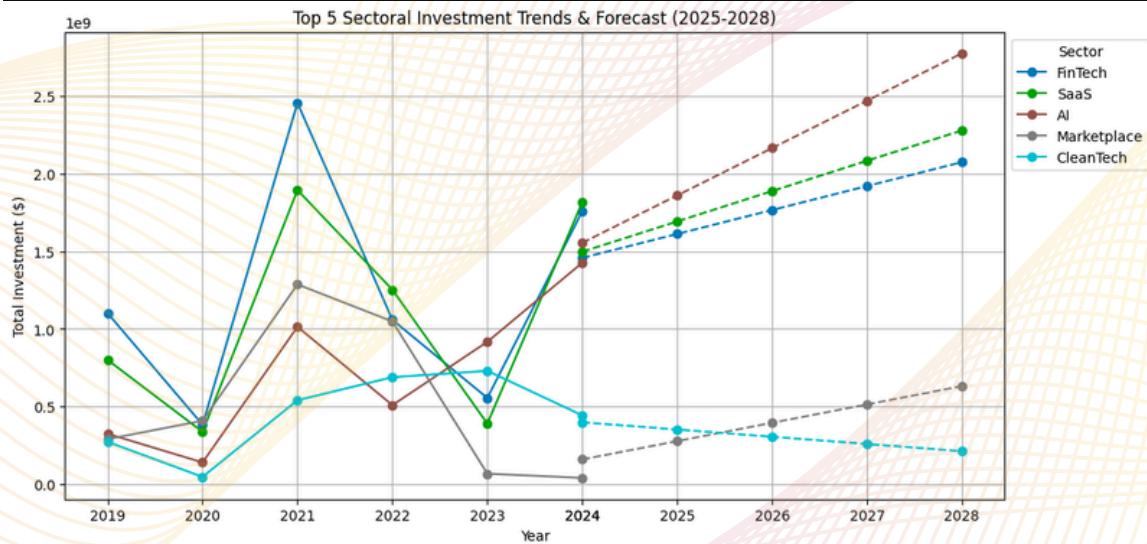
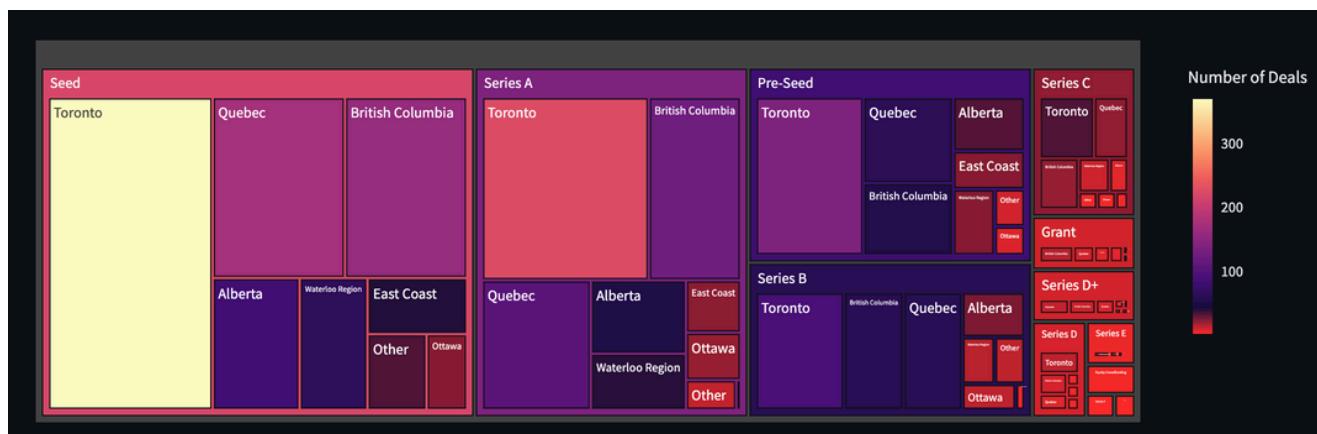


6. SECTORAL & REGIONAL INSIGHTS

The regional investment trends indicate that Toronto dominates in both deal volume and funding stages, reinforcing its position as Canada's primary tech hub. Other cities, such as Vancouver, Montreal, and Calgary, also show strong sectoral investment, with a focus on AI, CleanTech, and FinTech.

Toronto and Montreal receive the most early-stage investments, making them attractive for startups seeking pre-seed and seed funding. However, later-stage funding is more distributed across regions, suggesting that scaling startups may have more opportunities beyond Toronto. CleanTech investment is particularly strong in Calgary, aligning with the city's focus on sustainable energy.

For startups, the data suggests that securing early funding is most feasible in Toronto and Montreal. Investors should monitor emerging hubs outside Toronto, particularly in AI and HealthTech, as these sectors continue to grow nationally.



6. CONCLUSION

The Canadian tech investment landscape has experienced dynamic shifts over the past five years, reflecting evolving market conditions, investor priorities, and sectoral trends. This report highlights key insights into investment patterns, funding stages, sectoral performance, regional dynamics, and investor behaviour to provide a comprehensive understanding of where the ecosystem stands today and where it is headed.

These significant changes have been marked by a surge in 2021 followed by a decline and projected stabilization post-2025. This evolution reflects broader macroeconomic trends, shifting investor priorities, and a recalibration of funding strategies. Startups must now focus on financial sustainability and clear profitability pathways to secure investment in an increasingly selective market.

Sector trends show that AI, FinTech, CleanTech, and HealthTech continue to dominate across funding phases, highlighting their long-term development potential. Regional study affirms Toronto as the key investment hub, while Montreal, Vancouver, and Calgary are developing as major participants in specialized industries.

Investor behaviour indicates that US corporations remain the top contributors, while Canadian investors are more active in early-stage funding. Later-stage investment is becoming more competitive, and firms must demonstrate scalability and revenue creation in order to receive cash.

Moving forward, the funding market will most likely reward firms that value operational efficiency and agility. Investors should prioritize durable industries with consistent growth, such as AI and Fintech, while entrepreneurs should deliberately arrange funding rounds to coincide with market conditions. Using these insights, investors and entrepreneurs may better navigate the dynamic tech ecosystem and position themselves for long-term success.