Matthieu Colliaux, 2026

Financial Performance & Risk Simulation

https://github.com/matthieuco/matthieu-colliaux-data-portfolio/tree/main/projects/financial_performance%26risk_simulation

Context & Objectives

Using real-world transactional data(2022-2023) from a Café/Bakery in Vancouver. I designed an end-to-end financial analytics pipeline to demonstrate how financial data can be transformed into a decision-support tool for small business owners.

🎯 Business Problem :

Small retail businesses often :

- Operate without structured financial monitoring
- Struggle with seasonal volatility
- Lack visibility on cost structure
- Make hiring decisions without financial simulation

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📦 Dataset

- **Source**: Small Business Financial Dataset (2022–2023) (Kaggle)
- **Data types**: bank accounts & credit card transactions

🏗️ End-to-End Data Architecture

- Python → SQL → BigQuery → Power BI
- This project was intentionally designed as a complete analytics pipeline to demonstrate production-ready thinking.

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🔍 Methodology

1. Data Audit & Validation (Python)
2. Financial OLAP Modeling (SQL)
3. Cloud Data Warehouse (Google BigQuery)
4. Executive Dashboard (Power BI)
5. Interpretation & Recommendations

📈 Live Time Activity (slide 1/4)

🎯 Objective : Monitor last month performance & MoM comparison

📈 KPIs :

- current month performance (Cash In/ CashOut)
- Actual Cash Balance
- Runway (based on burn rate)
- Costs breakdown

➡️ Main Insights :

- Strong cash generation (actual cash balance : 358K)
- Comfortable gross margin (17,7K)
- Revenue +19% MoM, expenses +10% MoM

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Live Time Activity

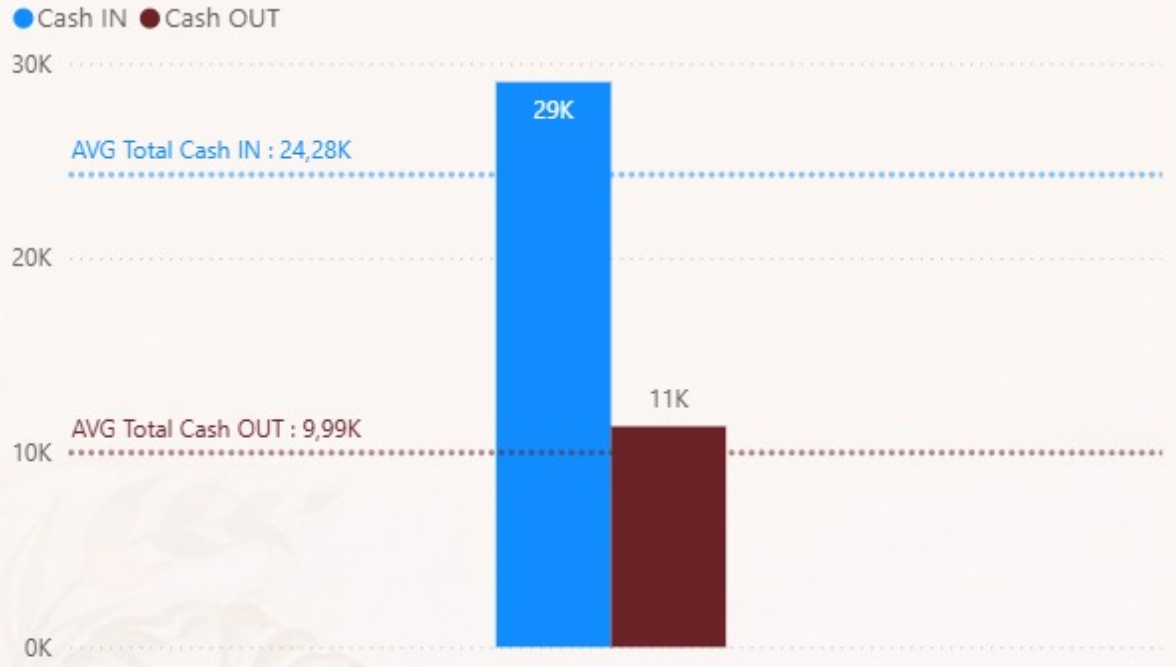
12 -2023

Last Transaction recorded : 31/12/2023

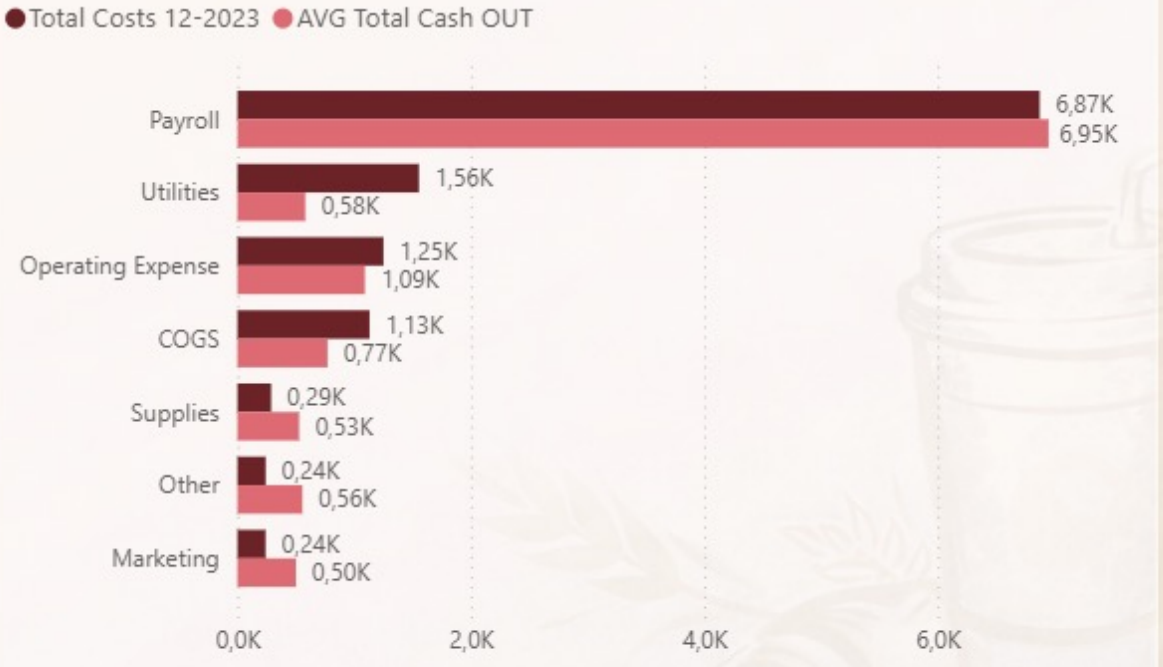
Initial Cash balance : 15K

Monthly Cash IN	Monthly Cash OUT	Monthly Gross Margin	Actual Total Cash Balance 2022-2023	Runway (months) based on last month burn
29,05K	11,34K	17,70K	357,96K	32

Revenue +19% MoM | Expenses +10% MoM



Costs breakdown vs Monthly average



📊 Finance 2022/2023 (slide 2/4)

🎯 Objective : Costs and Revenue analysis 2022/2023

📈 KPIs :

- Revenue vs Cost YoY
- Margin analysis YoY
- Costs structure breakdown YoY

➡️ Main Insights :

- Cost growth (+4,6%) outpaced revenue (-0.1%) in 2023
- Payroll accounts for 66% of operating costs
- Payroll costs increased by +6.9K in 2023

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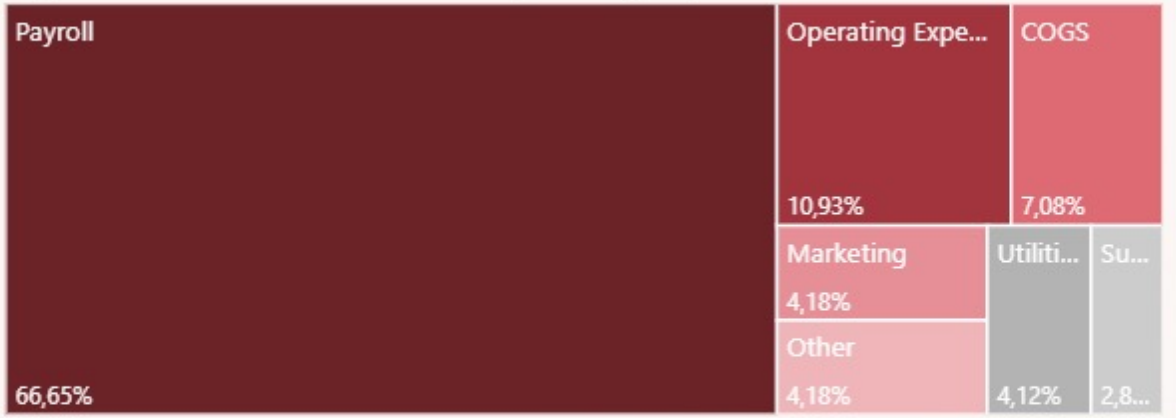
Finance 2022/2023

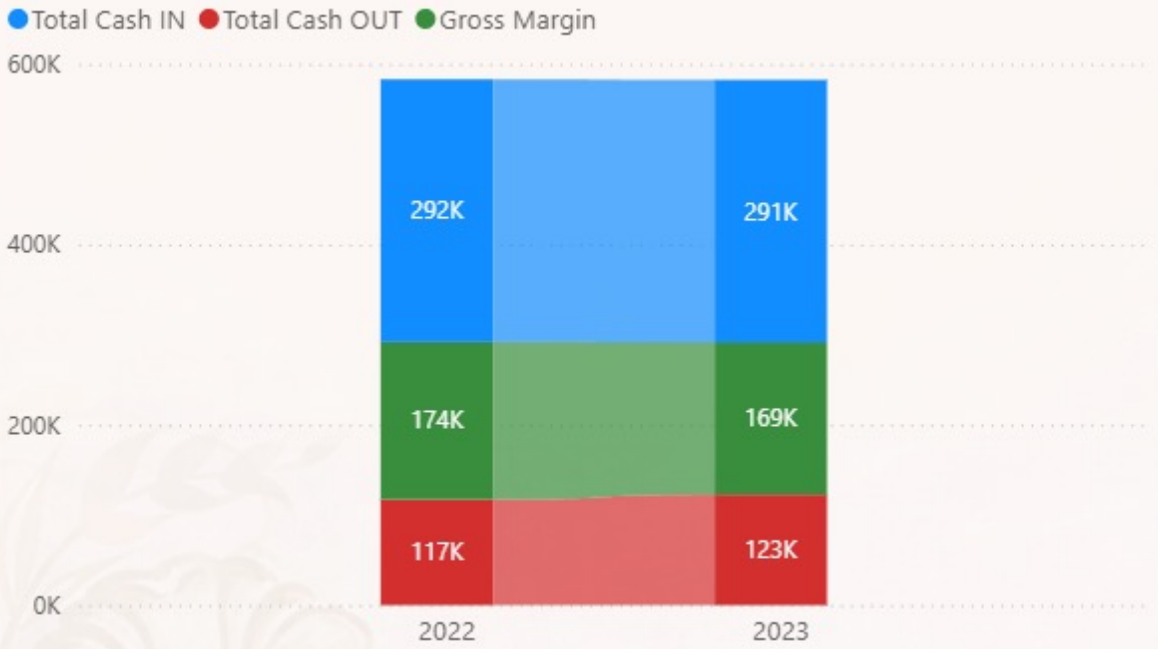
Margin YoY	Total Revenue YoY	Total Costs YoY
-3,30 %	-0,11 %	4,63 %

Cost growth (+4.6%) outpaced revenue (-0.1%), reducing margin by 3.3%. Payroll is the primary driver.

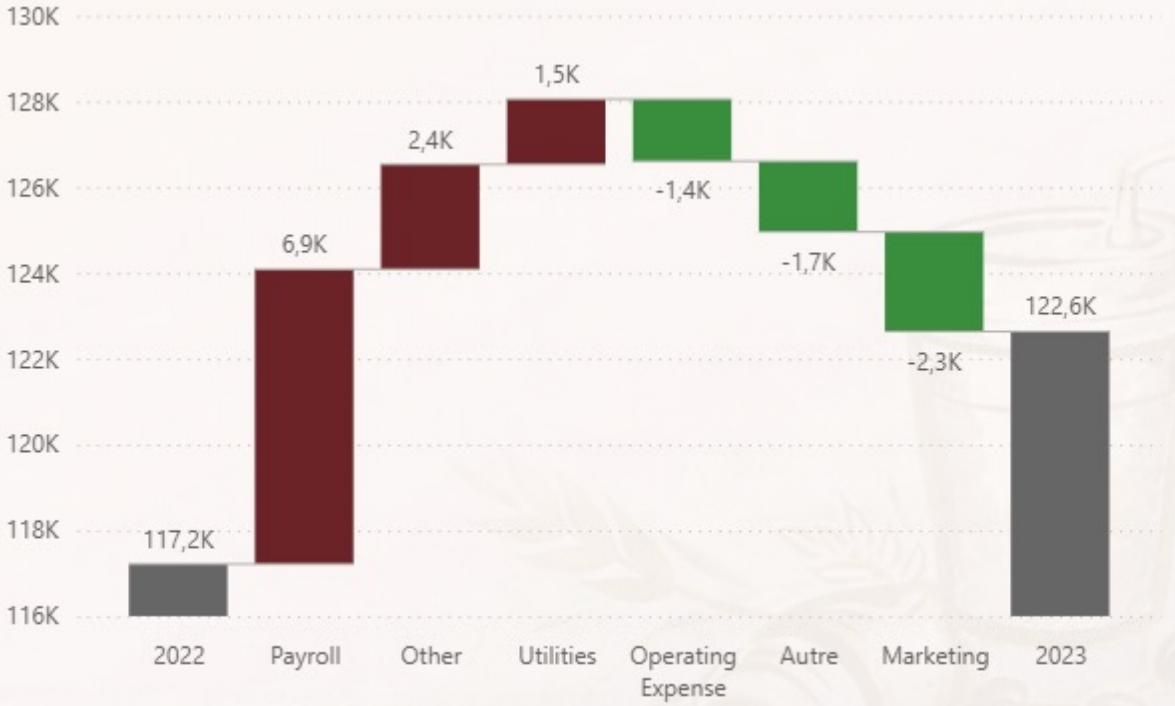
Payroll accounts for 66% of total operating expenses



Gross margin slightly decreased in 2023 due to cost growth outpacing revenue



Costs rise in 2023 due to Payroll rise



📊 Financial Trends & Seasonality (slide 3/4)

🎯 Objective : Analyze activity seasonality over time

📈 KPIs :

- Cash growth trajectory
- Seasonal volatility patterns
- Expenses stability

➡️ Main Insights :

- Strong seasonal dip in Q2
- Cash position remains structurally healthy

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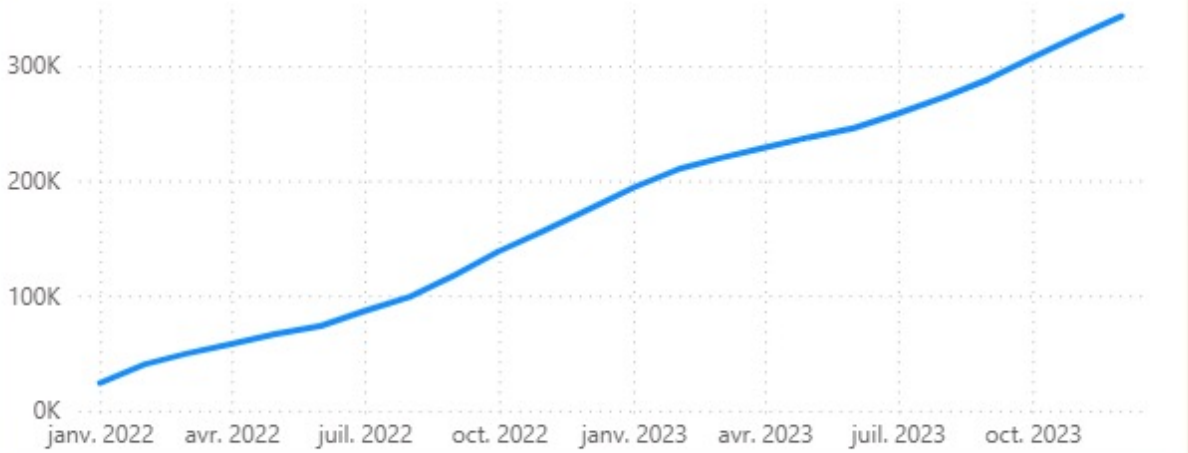
Financial Trends & Seasonality

Margin anomaly in Feb 2022 due to payroll timing effect.

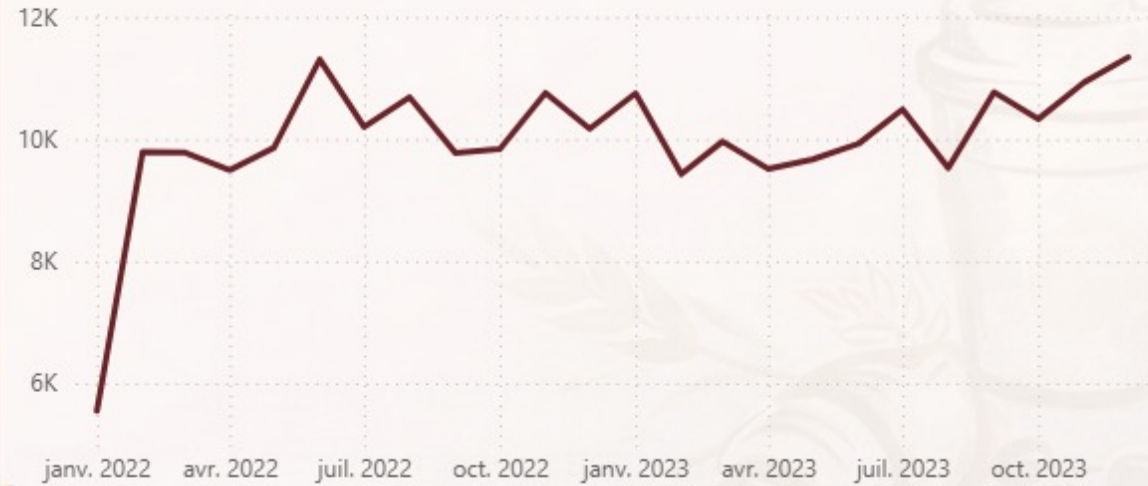
Cash balance increasing over the month



Lowest seasonal margin occurs in Q2. Cash buffer remains sufficient

Strong seasonal pattern: lower activity Feb–Jun, peak in October

Stable operating expenses ranging between 9K–12K per month



📊 Scenario Simulation – What-if Analysis (slide 4/4)

🎯 Objective : Development of an interactive financial stress-testing module

⚙️ Variables :

- Additional hire (0-5)
- Revenue activity level (% vs baseline)

📉 Outputs:

- Margin impact
- Simulated runway
- Dynamic risk classification (Safe/Moderate/High Risk)

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Scenario Simulation

Simulation recruitment (default 0)

Critical recruitment threshold : 4

1

Revenue Level Simulation (% of baseline)

Critical revenue threshold: 65%

90

Safe

Simulated Runway

7

Impact on margin

-28,65 %

Scenario Simulation

Simulation recruitment (default 0)

Critical recruitment threshold : 4

2

Revenue Level Simulation (% of baseline)

Critical revenue threshold: 65%

80

High Risk

Simulated Runway

4

Impact on margin

-57,29 %

✅ Business Recommendations

1️⃣ Cost Structure Optimization (High Priority)

- Optimize staffing levels during low season (Q2)
- Implement dynamic workforce scheduling
- Introduce partial performance-based compensation

2️⃣ Seasonality Management

- Deploy targeted promotions during low season
- Launch subscription-based products (ex:coffee membership)
- Develop local partnerships to stabilize demand
- Align marketing budget with seasonal peaks

3️⃣ Risk Management Framework

- Establish a critical revenue threshold for hiring decisions
- Require scenario simulation before fixed cost increases
- Maintain minimum 6–9 months of fixed costs in cash buffer

4️⃣ Strategic Use of Excess Cash

- Invest in digital marketing expansion
- Upgrade operational equipment
- Assess feasibility of a second location

https://github.com/matthieuco/matthieu-colliaux-data-portfolio/tree/main/projects/delivery_delays%26customer_satisfaction

🎯 Strategic Conclusion

The business is financially healthy but exposed to:

- Payroll concentration risk
- Seasonal volatility

With disciplined cost control and targeted revenue optimization, the company can strengthen profitability while preserving its strong cash position.

📌 Value Delivered

Through this project, I demonstrated :

- End-to-end financial data pipeline design
- Financial KPI structuring for SME decision-making
- Risk-based scenario modeling
- Executive storytelling through data

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