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Case study 2

Foreign Exchange Hedging Strategies

Transactional and Translational Exposures

MCF – Group2 – Team7

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Agenda 🎯

- ✓ Company Overview
- ✓ FX Exposure and Hedging Policy
- ✓ Hedging Policy Optimization
- ✓ Analysis of FX Hedging Payoffs
- ✓ Final Recommendations

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Company Overview

Company introduction

Company Overview

World's largest automaker

Unit sales of 8.5 mln vehicles in 2001

15.1% worldwide market share

World's sales leader since 1931

Founded in 1908

Has manufacturing operations in more than 30 countries

Vehicles are sold in approximately 200 countries

Major product lines

- Vehicles;
- Financial service for automotive;
- Mortgage;
- Business financing;
- Insurance services through GMAC;
- Satellite television and commercial satellite services through Hughes Electronics;
- Locomotives and heavy duty transmissions

Financials

In 2000:
Earnings: $4.4bln
Sales: $184.6bln
Labour costs: $19.8bln ($8.5bln US personnel)
Number of employees: 365.000

Market Share	
Latin America	20%
Europe	10% (20% with Fiat*)
Asia	4%

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FX Exposure and Hedging Policy

Determination of Exposure

Transaction Exposure

Transaction exposure is the risk that exchange rate movements **affect future foreign-currency cash flows**, like receivables or payables. It has a **real economic impact** and can be hedged through instruments such as forwards, futures, options, or swaps.

Translation Exposure

Translation exposure, instead, is the accounting risk that arises when foreign subsidiary items are converted into the group's reporting currency for consolidation. It impacts **financial statement values**, not actual cash.

Transaction vs Translation Exposure

	Transaction	Translation
Features	• Fx risk on actual cash flows • Impact real profit and liquidity • Happens until the transaction is settled • Hedged with forward, futures, options	• Fx risk from converting foreign subsidiaries accounts • Impacts reported earnings, not cash flows • Occurs at financial reporting dates • Hedged with balance sheet hedging/swaps

Hedging Policy

What	GM hedges **transaction exposures only**, such as *commercial* (operating) exposures, *capital expenditures* exposures and *financia*l exposures, and **ignore translation exposures** (balance sheet exposures).
Why	A **passive approach** replaced the active one because investment of resources in active FX management had not resulted in significant outperformance of passive benchmarks. Use a **fixed hedging ratio**, like 50% for commercial (operating) exposures, 100% for capital expenditures exposures and financial exposures Comply hedge rules rather than adjusting hedge to match forecast changes. A primary objective of GM' hedging policy is to reduce cash flow and earnings volatility, not aim to earn more.
Where	• Hedges globally *but* executes on a regional level. • Each regional center collects monthly forecasts of cash flows • The exposure totals from **each regional unit** are **aggregated** to determine the **corporate grand total** for GM • All hedging activities are executed **centrally** in two centers: The Domestic Finance group in New York and The European Regional Treasury Center (ERTC), which provide strategic support to GM entities within that region.

	Commercial (operating) exposures	Capital expenditures exposures	Financial exposures
How much	50%	100%	100% (50% for dividend payments)
Financial tools	Forward contracts (months 1 through 6) Options (months 7 through 12)	Forward contracts	Forward contracts

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Hedging Policy Optimization

Overview

The decision for General Motors (GM) to deviate from its *standard 50%* hedging policy *to a 75% hedge* for its **Canadian dollar (CAD)** exposure requires a three steps process:

GM's **primary objective** of ***reducing earnings volatility***

Determination of Exposure

- Types
- Sizes

Qualitative Assessment

- Arguments for deviation
- Arguments against deviation

Quantitative Assessment

- Exposures and Inputs
- Comparison
- EPS Volatility Reduction

Determination of Exposure

For GM-Canada, the U.S. dollar (USD) is **its functional currency**. Consequently, its exposure to the Canadian dollar impacts GM's worldwide income statement through two main components, as both are equivalent to short positions in the CAD:

A. Transactional (Commercial) Exposure (Cash Flow)

This exposure stems from CAD-denominated cash flows, primarily due to Canadian supplier payments being larger than CAD-denominated sales.

• **Size:** The projected 12-month C$ cash flow forecast (net payable) as of September 30, 2001, was **CAD 1.682 billion**. The exposure is generally cited as approximately CAD 1.7 billion.

B. Translational (Balance Sheet) Exposure (Net Monetary Liability)

This exposure arises because the subsidiary's functional currency is the USD, causing gains and losses on CAD net monetary assets and liabilities to flow through the income statement.

• **Size:** The C$ net monetary asset/(liability) position as of September 30, 2001, was a liability of **CAD 2.143 billion**. This liability stems mainly from future pension and postretirement benefit obligations.

C. Total Income-Statement Sensitive Exposure (Net Short CAD Position)

Since GM-Canada uses the USD functional currency, **both** the transactional and translational exposures impact the income statement.

Determination of Exposure (Cont.)

Gross Total Short Exposure

- Commercial Exposure: CAD 1.700 Billion
- Monetary Liability: CAD 2.143 Billion
- **Total Gross Exposure: CAD 3.843 Billion**

Adjusted Net Short Exposure

- The analysis must reflect the "excess cash" of CAD 660 million held by GM Canada. Cash is a monetary asset. Netting this excess cash asset against the total gross liability position provides the net exposure sensitive to exchange rate movements:
  - Adjusted Net Exposure: CAD 3.843 B - CAD 0.660 B = **CAD 3.183 Billion** (Net Short CAD Position).

Qualitative Assessment

Arguments **for** deviation (Opting for 75% Hedging)

Alignment with Core Objective (Reducing Earnings Volatility): GM's primary objective for its foreign exchange risk management policy is to **reduce cash flow and earnings volatility.**

Income Statement Impact of Translation Exposure: Although GM's overall corporate policy dictates ignoring translation exposures, this policy is based on the assumption that translation adjustments typically go directly to shareholder's equity (Owner's Equity) for local-currency functional subsidiaries. However, since GM-Canada's functional currency is the USD, the **CAD 2.1 billion net monetary liability (translation exposure)** also generates gains and losses that impact the worldwide income statement.

Mitigating Total Risk: Since both the transactional (CAD 1.7 billion) and translational (CAD 2.1 billion) exposures are equivalent to **short positions in the CAD**, increasing the hedge on the commercial exposure to 75% is a mechanism to hedge the overall combined short CAD position hitting the income statement. The proposal specifically recommends 75% hedging of commercial exposure **"In order to reduce global earnings volatility at year-end,"** suggesting this action implicitly hedges approximately 30% of the balance sheet exposure.

Policy Flexibility: GM's formal policies permit special attention and possible deviation from the stated policy when situations arise, provided the Treasurer (Feldstein) approves the deviation.

Qualitative Assessment (Cont.)

Arguments **against** deviation (Maintaining 50% Hedging)

Violation of Passive Policy: The standing policy mandates hedging only 50% of significant commercial exposures on a regional level. Deviating to 75% means moving away from the **passive approach** adopted after an internal study determined that active FX management had not resulted in significant outperformance of passive benchmarks.

Policy Consistency: GM policy distinguishes between commercial (operating) exposures, which are hedged at 50%, and capital expenditures and financial exposures, which are often hedged at 100%. Deviation blurs this distinction and goes against the established corporate guidance, which usually requires regional approval for deviating from a passive strategy.

Cost of Hedging: While Ostermann ignored the costs of hedging (such as option premiums) to simplify the volatility calculation, increasing the hedge ratio from 50% to 75% necessarily increases the costs associated with derivative instruments.

Quantitative Assessment

GM's standard policy calls for hedging **50% of the commercial exposure only**, thus hedging CAD 0.850 billion. Ostermann's proposal seeks to increase the hedge to **75% of the total commercial exposure** (CAD 1.7 B) to reduce global earnings volatility by *effectively covering some of the balance sheet exposure*.

Hedge Scenario	Hedge Ratio Applied to Commercial Exposure (CAD 1.7 B)	Hedge Amount (CAD Billions)
Current Policy	50%	1.7B * 0.5 = **0.850B**
Proposed Deviation	75%	1.7B * 0.75 = **1.275B**

Quantitative Assessment (Cont.)

Table 1: CAD Exposures and Key Calculation Inputs

Input	Value	Explanation
Functional Currency	USD	GM-Canada uses the USD as its functional currency, meaning its CAD exposure is recognized as a foreign currency exposure that impacts the income statement.
Commercial CF Exposure	C$ (1,682)M	The projected net payable exposure over the subsequent twelve months. GM's passive policy generally hedges this type of exposure.
Translation Exposure	C$ (2,143)M	The net monetary liability position, primarily driven by future pension and postretirement benefit obligations. GM's corporate policy typically ignores translation exposures.
Excess Cash Held by GM Canada	C$ 660 M	This long CAD position offsets part of the short exposures.
Total Net Adjusted Short CAD Exposure	CAD 3.183 B	The net exposure figure used for the volatility calculation.
Reference Exchange Rate	1.5780 C$/$	The rate around which the volatility test was requested.
Volatility Shock Tested	+/- 3.1%$	The mandated exchange rate movement for the sensitivity calculation.
Shares Outstanding	550 M	The divisor used to determine the EPS impact.
Assumed Corporate Tax Rate	35%	Used to measure the after-tax gain/loss impact

Quantitative Assessment (Cont.)

Table 2: Comparison of Hedging Strategies

Strategy	Hedge Ratio Applied to Commercial Exposure	Hedge Amount (CAD B)	Implied Coverage of Balance Sheet Exposure
A. Standard Passive Policy	50%	0.850	Generally 0%
B. Proposed Deviation	75%	1.275	30%

Quantitative Assessment (Cont.)

Table 3: Sensitivity Analysis to Determine EPS Volatility Reduction

	Scenario A: Standard Policy (50%)	Scenario B: Proposed Deviation (75%)	Explanation
Total Net Adjusted Short CAD Exposure (CAD B)	3.183	3.183	The combined short exposure analyzed
Hedge Amount (CAD B)	0.850	1.275	The amount covered by hedging instruments
Unhedged Exposure (CAD B)	2.333	1.908	$Total\ Net\ Exposure - Hedge\ Amunt$
Pre-Tax FX Impact (3.1% Shock) (CAD M)	72.323	59.148	$Unhedged\ Exposure \times 0.031$
After-Tax FX Impact (35% Tax) (CAD M)	47.010	38.446	$Pre\ Tax\ impact \times (1 - 0.035)$
EPS Volatility ($)	0.0853	0.0699	$\frac{After\ Tax\ impact}{(1.5780 \times 550M)}$

Quantitative Assessment (Cont.)

Table 4: Summary of Volatility Reduction

	Result	Rationale
EPS Volatility Under 50% Policy	0.0853	The maximum potential EPS swing under the standard policy
EPS Volatility Under 75% Proposal	0.0699	The reduced potential EPS swing under the proposed deviation
Reduction in EPS Volatility	$0.0154	The difference between the two scenarios ($0.0853 - $0.0699), confirming that the 75% strategy achieves the goal of reducing earnings volatility

Quantitative Assessment (Cont.)

Analogy

If GM's earnings stability were a house susceptible to hurricanes (exchange rate movements), the standard 50% policy is like insuring only the roof (commercial exposure) while ignoring the foundation (translational exposure), even though a USD functional currency means both structural elements transmit damage directly to the internal finances (income statement). Deviating to the 75% policy increases the coverage on the roof, and crucially, provides enough extra support to stabilize the vulnerable foundation, reducing the overall sway (volatility) of the structure.

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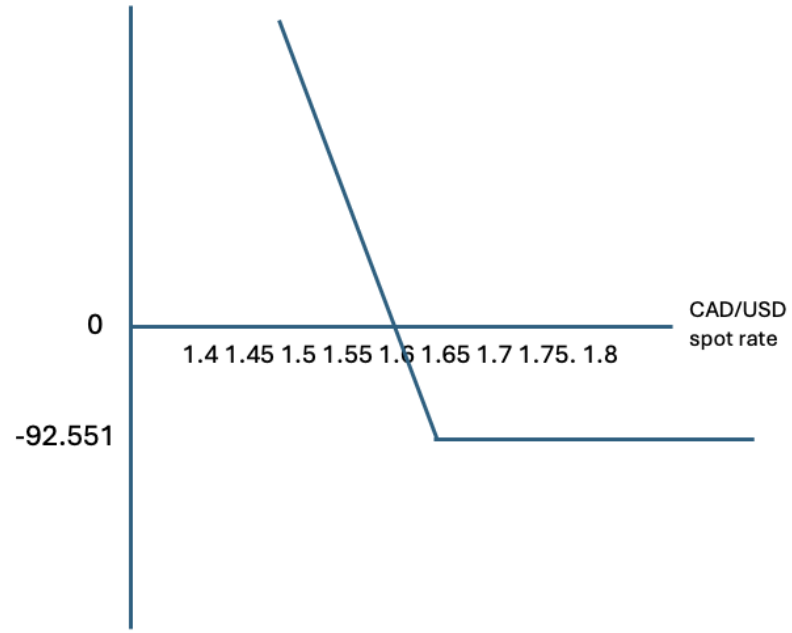
Analysis of FX Hedging Payoffs

Payoff of three strategies- Option hedge

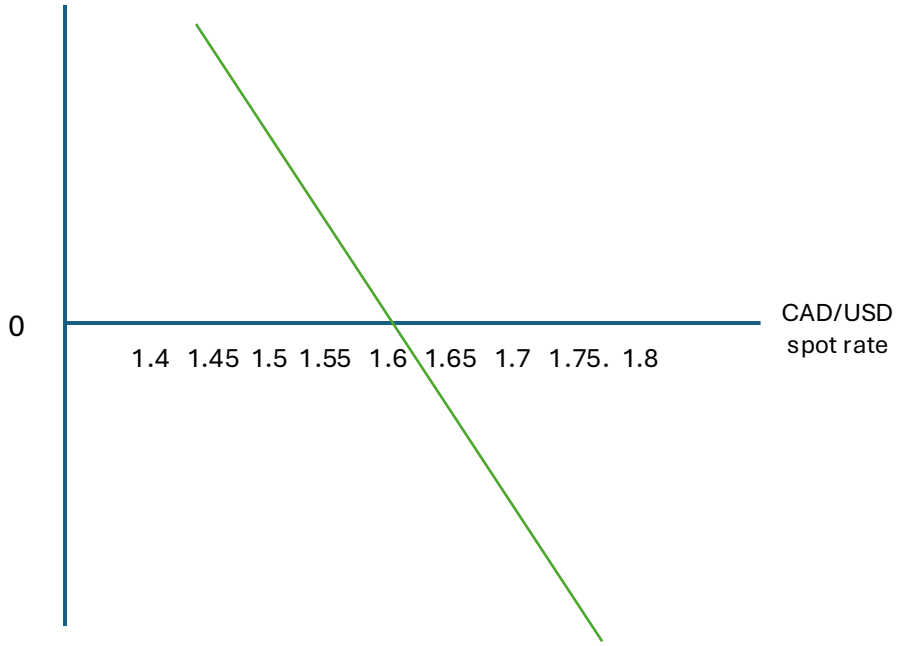
- Spot= 1.5621
- 3-month forward rate = 1.5667
- GM hedges CAD 10mln
- No upfront cost, hence
- GM locks in USD outflow at USD = 6,382,343



- If spot>1.5667 : GM loses only premium
- If spot<1.5667: GM gains

Payoff of three strategies- Forward hedge

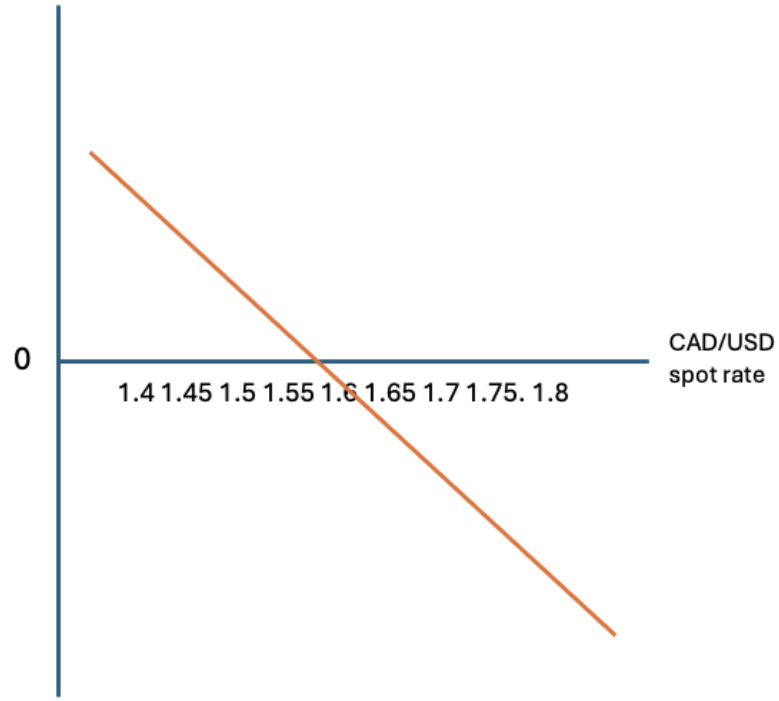
- Strike = 1.5667
- Premium = 1.45% of USD notional
- USD notional =6,382,343
- Premium = 92,551
- **Payoff formula = max(spot-strike;0)*CAD10m/Spot-premium**



- If spot>1.5667 : GM loses
- If spot<1.5667: GM gains
- No premium

Payoff of three strategies- No hedge

No hedge



- Spot strengthens: GM loses
- Spot weakens: GM gains

Pros and cons of the strategies

	Forwards	Options
Pros	• No upfront costs • Full protection on the hedged portion • Simple in execution	• GM keeps downside benefit if CAD weakens • Upside protection if CAD strengthens
Cons	• No upside participation: if CAD weakens, GM cannot benefit • Locks GM in 1.5667 even if CAD falls	• Premium cost of 92,551 on 10mln CAD • More expensive then forward • Only partially protects again volatility until deep in the money

Recommendation for GM

GM should use the forward hedge for the deviation from policy

Reasons:

- GM's goal is to reduce cashflow and earnings volatility : forward locks the rate
- GM's exposure is very large and effects income statement.

Option premium on large notional 1.7bln CAD would be expensive

- Options will be better chose if GM believes that CAD will weaken
- Forwards have no upfront cost

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Final Recommendations

Final Recommendations

Increase CAD Hedge Ratio to 75%

Rationale:

- Reduces significant cash-flow and earnings volatility from CAD commercial exposure and monetary liabilities
- Higher hedge ratio provides stronger downside protection with limited opportunity cost
- Exposure size is large relative to GM's income statement and requires tighter risk control

Preferred Instrument-Forward contracts

- Forwards lock in the exchange rate and require no upfront premium
- More cost-efficient than options for a large notional amount
- Options may be used selectively only if CAD depreciation is expected

Overall Assessment

The 50 percent passive hedging policy is reasonable for most currencies, but the CAD exposure is sufficiently large and, together with the subsidiary's use of the US dollar as its functional currency, warrants a more active hedging approach.