Derivatives 101: Managing FX and Interest Rate Risk

Jesse Weiner
Wednesday, June 13, 2018
2:00 to 3:00pm
Session 27080
Table of Contents

I. Markets – Size / Scope / Players

II. Derivative Concepts

III. Potential Impact of FX and Interest Rate Moves

IV. What to Do?

V. Strategic and Tactical Considerations
The derivatives markets are the biggest in the world

- FX and Interest Rate derivative markets dwarf others

“The derivatives market is, in a word, gigantic, often estimated at more than $1.2 quadrillion. Some market analysts estimate the derivatives market at more than 10 times the size of the total world gross domestic product.”
- How big is the derivatives market, Investopedia, May 27, 2015

- Hedgers, speculators, providers, investors

- Sophisticated participants including SWF’s, Hedge Funds, Large Corporates, Banks
## A Varied Market

- OTC versus Exchange Traded – Custom versus Standard
- Majority of FX and Interest rate products are OTC
- OTC Markets are open around the clock
- Choose your underlying, tenor, size, structure, etc
- Spot, forward, swap, option, exotic, and on and on
Future Value and Present Value

- FV = A dollar today is worth a dollar plus interest tomorrow:

$$FV = PV \times (1+R)^t$$ ... or ... $$PV = FV / (1+R)^t$$

- Derivative Valuation can get complex:

$$P = Ke^{-(r_d - r_f T)\sigma^2}N(-d_2) - S_0e^{-r_f T}N(-d_1)$$

$$d_1 = \frac{\ln(S_0/K) + (r_d - r_f + \sigma^2/2)T}{\sigma\sqrt{T}}$$

$$d_2 = d_1 - \sigma\sqrt{T}$$

- This is BS............ **Black-Scholes**
FX Forward Points

- Essentially the Future Value each currency:

\[ F = S \frac{(1 + i_f)^t}{(1 + i_d)^t} \]

- The forward rate reflects the interest rate differential

- The currency with the lower interest rate will have the higher forward value
Expectations Theory – Longer term rates represent where rates are expected to be in the future

Liquidity Theory – Longer term rates reflect liquidity restraints/needs (i.e. an investor demands a higher rate to lock up funds for a longer term)

Hybrid Theory – Combination of both of the above
US based companies with subsidiaries operating overseas are broadly exposed to a stronger USD / weaker foreign currencies

### A Strong dollar can hurt

- **Delta Airlines, Inc. (March 2016 10Q)** - *Unit revenue declines in the Pacific primarily resulted from the strength of the U.S. dollar and lower international fuel surcharges*....

- **Brown-Forman Corporation (2015 10K)** - *Foreign currency headwinds anticipated to continue. The more we expand our business globally, the more exchange rate fluctuations relative to the U.S. dollar influence our financial results. Our reported results were significantly affected in fiscal 2015 by negative foreign exchange due to the strength of the U.S. dollar, and we anticipate our fiscal 2016 results will be negatively affected as well.*

- **Coca-Cola Enterprises, Inc. (2015 10K)** – *Persistent currency headwinds ....decreased our net sales by 13.5 percent, our operating income by 16.0 percent and diluted earnings per share by 22.0 percent*;

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Types of FX exposure

Immediate Currency Needs
- **Immediate Need**
  - FX Payments
  - FX Receipts

Balance Sheet Exposure
- **Impending Need**
  - Existing FX Denominated Payables and Receivables

Cash Flow Exposure
- **Eventual Need**
  - Forecasted FX Denominated Transactions

Earnings Translation
- **Strategic Hedge**
  - Foreign Income Statement items at Foreign Subs translated to USD

Net Investment
- **Strategic Hedge**
  - Foreign Balance Sheet Translated to USD with change in value captured in CTA

<table>
<thead>
<tr>
<th>Immediate Need</th>
<th>Impending Need</th>
<th>Eventual Need</th>
<th>Strategic Hedge</th>
</tr>
</thead>
<tbody>
<tr>
<td>73%</td>
<td>62%</td>
<td>14%</td>
<td>12%</td>
</tr>
</tbody>
</table>

% of customers that hedge

Other Strategic Exposures
- Capital Structure
- Intercompany loans (might be balance sheet)
- Economic

Potential Impact of FX and Interest Rate Moves

Impact of Interest Rates

Traditional Borrowers suffer from higher rates
- Higher Cost of debt/lower net cash flow/lower earnings
- Interest coverage ratios

Asset Liability Management
- Lower rates increase pension obligations
- Investment returns versus debt cost

Banks
- Low rates compress margins
- Slope of YC can be more important than nominal level
In theory, risk management can mitigate the adverse effects of capital market imperfections that would otherwise weigh on firm performance and value.

### Benefits of Risk Management

- **Reduced financing costs**
  - Cash flow and earnings smoothing
  - Reduced risk of financial distress

- **Reduced costs from under investment**
  - Reduced risk of unanticipated cash shortfalls
  - Reduced agency costs (due to misalignment of management, shareholder, and bondholder interests)

- **Reduced taxes**
  - Direct effects from income smoothing
  - Indirect effects from increased debt capacity

- **Reduced costs from imperfect information**
  - Investors better able to assess quality of management
What to Do?

Does Risk Management Enhance Firm Value in Practice?

“Recent empirical evidence provides support for the theoretical propositions in the literature that risk management increase firm value and returns, while reducing return and cash flow volatility.”


<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Sector/Industry</th>
<th>Sample Size</th>
<th>Country/Region</th>
<th>FX</th>
<th>Interest Rates</th>
<th>Commodity</th>
<th>Deriv in Gen'/Other</th>
<th>Observations</th>
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<tr>
<td>Campello, Lin, Ma, and Zou</td>
<td>2010</td>
<td>Broad</td>
<td>2,288</td>
<td>US</td>
<td>+</td>
<td></td>
<td>+</td>
<td></td>
<td>FX and interest rate hedgers pay lower interest spreads &amp; less likely to have capital spending restrictions in loan agreements</td>
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<tr>
<td>Fauver and Naranjo</td>
<td>2010</td>
<td>Broad</td>
<td>1,746</td>
<td>US</td>
<td>&quot;+&quot;</td>
<td>&quot;+&quot;</td>
<td>+</td>
<td></td>
<td>A negative relationship between hedging and firm value for firms with greater agency costs and weak corporate governance</td>
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<tr>
<td>Allayannis and Weston</td>
<td>2001</td>
<td>Non-financial</td>
<td>720</td>
<td>US</td>
<td>+</td>
<td></td>
<td>+</td>
<td></td>
<td>Use of weather derivatives enhances firm value</td>
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<tr>
<td>Perez-Gonzalez and Yun</td>
<td>2013</td>
<td>Electric and gas utilities</td>
<td>203</td>
<td>US</td>
<td>+</td>
<td></td>
<td>+</td>
<td></td>
<td>Use of reinsurance increases firm value</td>
</tr>
<tr>
<td>Scordis and Steinorth</td>
<td>2012</td>
<td>Ins. holding companies</td>
<td>67</td>
<td>US</td>
<td>+</td>
<td></td>
<td>+</td>
<td></td>
<td>Stronger effects for large firms</td>
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<td>Nelson, Moffitt, and Affleck-Graves</td>
<td>2005</td>
<td>Public</td>
<td>US</td>
<td></td>
<td>+</td>
<td></td>
<td>+</td>
<td></td>
<td>Access to crop management insurance programs enhances access to financing and increases productivity</td>
</tr>
<tr>
<td>Comaglia</td>
<td>2013</td>
<td>Agriculture</td>
<td>US</td>
<td></td>
<td></td>
<td></td>
<td>+</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treanor, Rogers, Carter, and Sinkins</td>
<td>2014</td>
<td>Airlines</td>
<td>US</td>
<td></td>
<td>+</td>
<td></td>
<td>+</td>
<td></td>
<td>A value premium to hedging, stronger for firms that have stable hedge practices compared to ones that hedge more when prices high/rising</td>
</tr>
<tr>
<td>Gilje and Taillard</td>
<td>2014</td>
<td>Oil producers</td>
<td>US &amp; Canada</td>
<td></td>
<td>+</td>
<td>&quot;+&quot;</td>
<td>+</td>
<td></td>
<td>Oil basis risk reduced effectiveness of WTI hedges for Canadian producers and had negative effects on firm values; effects greatest on highly leveraged firms</td>
</tr>
<tr>
<td>Ahmed, Azevedo, Guney</td>
<td>2014</td>
<td>Listed non-financial</td>
<td>288</td>
<td>UK</td>
<td>+</td>
<td>&quot;+&quot;</td>
<td>&quot;+&quot;</td>
<td></td>
<td>Users of derivatives have lower cash flow volatility, beta, and cost of capital</td>
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<tr>
<td>Belghitar, Clark, and Judge</td>
<td>2008</td>
<td>Non-financial firms</td>
<td>412</td>
<td>UK</td>
<td>+</td>
<td></td>
<td>+</td>
<td></td>
<td>Value premium for user of FX derivatives with strong internal or external governance</td>
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<tr>
<td>Panaretou</td>
<td>2014</td>
<td>Non-financial firms</td>
<td>US</td>
<td></td>
<td></td>
<td></td>
<td>+</td>
<td></td>
<td>Strongly governed firms use currency derivatives to reduce costs of external financing</td>
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<tr>
<td>Bartram, Brown, and Conrad</td>
<td>2011</td>
<td>Non-financial</td>
<td>6,888</td>
<td>47 countries</td>
<td>+</td>
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<td>+</td>
<td></td>
<td>Users of derivatives have lower cash flow volatility, beta, and cost of capital</td>
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<tr>
<td>Allayannis, Lel, and Miller</td>
<td>2012</td>
<td>Broad</td>
<td>1,500</td>
<td>Int'l firms with ADR</td>
<td>+</td>
<td></td>
<td>+</td>
<td></td>
<td>Value premium for user of FX derivatives with strong internal or external governance</td>
</tr>
<tr>
<td>Lel</td>
<td>2012</td>
<td>Broad</td>
<td>1,000</td>
<td>Int'l</td>
<td>&quot;+&quot;</td>
<td></td>
<td>-</td>
<td></td>
<td>Strongly governed firms use currency derivatives to reduce costs of external financing</td>
</tr>
<tr>
<td>Berghofer and Lucey</td>
<td>2014</td>
<td>Airlines</td>
<td>64</td>
<td>Int'l</td>
<td></td>
<td></td>
<td>-</td>
<td></td>
<td>Neither financial nor operational hedging (via fleet diversity) decrease risk exposure</td>
</tr>
<tr>
<td>Clark and Metfeh</td>
<td>2010</td>
<td>Non-financial</td>
<td>176</td>
<td>France</td>
<td>+</td>
<td></td>
<td>+</td>
<td></td>
<td>FX derivatives reduce FX exposure, but no value premium</td>
</tr>
<tr>
<td>Khediri and Folus</td>
<td>2010</td>
<td>Non-financial</td>
<td>320</td>
<td>France</td>
<td>-</td>
<td></td>
<td>-</td>
<td></td>
<td>Benefits from hedging &quot;concave&quot; revenues/ not hedging &quot;concave&quot; expenses</td>
</tr>
<tr>
<td>Belghitar, Clark, and Metfeh</td>
<td>2013</td>
<td>Broad</td>
<td>211</td>
<td>France</td>
<td>&quot;+&quot;</td>
<td></td>
<td>+</td>
<td></td>
<td>Hedging selective; gains economically small</td>
</tr>
<tr>
<td>Hagelin, Holmen, Knopf, and Pramborg</td>
<td>2007</td>
<td>Public</td>
<td>308</td>
<td>Sweden</td>
<td>+</td>
<td></td>
<td>+</td>
<td></td>
<td>Derivatives users have lower betas and costs of equity; results suggest hedging reduces financial distress risks</td>
</tr>
<tr>
<td>Carter, Rogers, and Simkins</td>
<td>2006</td>
<td>Airlines</td>
<td>28</td>
<td></td>
<td>+</td>
<td></td>
<td>+</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mackay and Moeller</td>
<td>2007</td>
<td>Petroleum refiners</td>
<td>34</td>
<td></td>
<td>+</td>
<td></td>
<td>+</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brown, Crabb, and Haushalter</td>
<td>2006</td>
<td>Gold mining</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-</td>
<td></td>
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<tr>
<td>Gay, Lin and Smith</td>
<td>2011</td>
<td>Non-financial</td>
<td></td>
<td></td>
<td>+</td>
<td></td>
<td>+</td>
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</table>

Source: Wells Fargo.
A successful FX risk management program includes eight critical components

1. Define your objectives
2. Identify your exposures
3. Quantify your FX risk
4. Develop your policy
5. Determine your strategy
6. Execute your strategy
7. Monitor your progress
8. Measure your performance

Source: Committee of the Sponsoring Organizations of the Treadway Commission (COSO)
FX risk management

Prioritize what matters most
- Protect your company’s economic value
- Mitigate risk to consolidated earnings
- Create certainty against budgeted results
- Protect your cash for future investment
- Increase your competitiveness in global markets
- Reduce earnings volatility for more stable pricing and sourcing
- Maintain your debt to EBITDA ratio
- Lower year-over-year volatility in financial results

Determine your time horizon
- Current quarter
- Fiscal year
- Future period-end
- Date of deal close

70% of companies indicate that smoothing the impact of FX rates is one of their top three risk management objectives.


All aspects of your company’s FX risk program should align to the goals you set

Source: Committee of the Sponsoring Organizations of the Treadway Commission (COSO)
Step 2: Identify your risk management exposures

FX risk management

1. Identify your exposures

Understand where you have FX risk
- Cash flows
- Subsidiary income statements
- Subsidiary net investment positions

Define “volatility” for your organization
- Over a discrete time period
- Period-to-period
- Same period comparison

Assess ability to mitigate FX risk
- Change invoice currency
- Adjust prices

47% of public companies cite accuracy and timeliness of data as their greatest risk management challenge.


Source: Committee of the Sponsoring Organizations of the Treadway Commission (COSO)
Step 3: Quantify your FX risk

FX risk management

**Best practice considerations**

- Take a risk-based approach
- Go beyond notional exposures
- Make decisions by comparing your potential risk with your organization’s risk tolerance
  - Hedge tenor
  - Hedge coverage ratios
- Identify potential impacts to your portfolio now as well as changes over time
- Communicate potential risks to your stakeholders to ensure the appropriate level of oversight

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*A clear picture of your exposures will reduce uncertainty and support a smart FX strategy*

Only 2 in 10 companies currently measure their FX risk.

Step 4: Develop your company’s risk management policy

FX risk management

Establish the right infrastructure
- Convene a risk management committee
- Clarify roles and responsibilities
- Define how you will measure economic performance
- Determine how FX performance will impact employee compensation
- Evaluate staff expertise
- Review and deploy necessary systems

Integrate risk management in strategic business decisions
- Pricing and sourcing
- Bid-to-award
- Project-related economics
- International market expansion
- Pricing as a competitive advantage

Source: Committee of the Sponsoring Organizations of the Treadway Commission (COSO)
How you hedge (e.g., timing, horizon, and instrument) is important

Assess:

- A broad range of alternatives: non-derivative actions, financing activities, and derivatives.
- How well strategies align with exposures and objectives: how much risk reduction are they likely to achieve?
- Potential costs and benefits of alternatives.
- Trade-offs among strategies: will hedging certain risks exacerbate others (e.g., to cash flows)?
- The accounting for exposures and strategies.

### FX Hedging: Wells Fargo 2018 Corporate Risk Management Practices Survey

<table>
<thead>
<tr>
<th>Exposures</th>
<th>Tenor</th>
<th>Coverage</th>
<th>Other Hedge Instruments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>&lt;6m</td>
<td>&gt;6m</td>
</tr>
<tr>
<td>Forecastsed Transactions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Balance Sheet Items</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trade Related</td>
<td>62%</td>
<td>20%</td>
<td>80%</td>
</tr>
<tr>
<td>Financing Related</td>
<td>63%</td>
<td>71%</td>
<td>29%</td>
</tr>
<tr>
<td>Currently</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ever</td>
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</table>

Strategic and Tactical Considerations

- Communication is key!
  - With investors, the Board, senior management, operational units, and others
  - Understand attitudes towards risk, priorities, challenges

- Get the data! You can’t hedge what you don’t understand or can’t see.
  - Forecast accuracy
  - Indirect effects (FX and prices; interest rates and revenue cyclicality; cash flow risks, leverage effects, and access to financing)

- Consider market conditions as they relate to hedge costs and performance
  - “Majors” versus “EM” currencies
  - Nominal level and slope of yield curve

- Don’t forget the accounting!
Putting It All Together
ABC Co Sells Products to Foreign Buyer

Forecasted

Forecast Cash Flow
€1 million

U.S.A.

Today

Cash Collection

Receive EUR
€1 million = ?? $

Germany

Potential Earnings and Cash Flow Risk

Equipment

€

Rate fluctuation
Types of exposure

**Time Horizon**
- 3 Months – 3 Years

**Hedge Instruments**
- Forward Contracts, Options, Option Combinations

**Time Horizon**
- Monthly Rolling Balance Sheet Hedge Program

**Hedge Instrument**
- Forward Contracts, Options, Option Combinations

### Diagram

- **Forecast Date**
- **Booking Date**
- **Cash Date**

- **Forecasted Transaction**
  - Underlying Transaction Booked and Recorded

- **Balance Sheet Mark-to-Market**
  - Cash Flow Occurs
## EUR 1,000,000 Revenue Booked on USD Functional Entity

### Budget Rate: 1MM EUR At 1.2000 EURUSD
- A/R $1.20 mio
- Revenue $1.20 mio

<table>
<thead>
<tr>
<th>Budget Rate: 1MM EUR At 1.2000 EURUSD</th>
<th>Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>A/R $1.20 mio</td>
<td>$1,200,000</td>
</tr>
<tr>
<td>Revenue $1.20 mio</td>
<td></td>
</tr>
</tbody>
</table>

### Actual Rate: 1MM EUR 1.2300 EURUSD
- A/R $1.25 mio
- Revenue $1.25 mio

<table>
<thead>
<tr>
<th>Actual Rate: 1MM EUR 1.2300 EURUSD</th>
<th>Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>A/R $1.25 mio</td>
<td>$1,230,000</td>
</tr>
<tr>
<td>Revenue $1.25 mio</td>
<td></td>
</tr>
</tbody>
</table>

### Variance to Budget:

<table>
<thead>
<tr>
<th>Variance to Budget:</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>$1,200,000 Revenue</td>
<td>$1,230,000</td>
</tr>
<tr>
<td>Revenue $1.20 mio</td>
<td>Revenue $1.25 mio</td>
</tr>
<tr>
<td>+$30,000</td>
<td></td>
</tr>
</tbody>
</table>
**Forecasted Transactions: Hedge forecasted FX risk**

EUR 1,000,000 Revenue Hedged on USD Functional Entity

<table>
<thead>
<tr>
<th>Budget Rate: 1MM EUR At 1.2000 EURUSD</th>
<th>$1,200,000 Revenue</th>
</tr>
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<tbody>
<tr>
<td>- A/R $1.20 mio</td>
<td></td>
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<tr>
<td>- Revenue $1.20 mio</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>T+ 6M Actual Rate: 1MM EUR 1.2300 EURUSD</th>
<th>$1,230,000 Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>- A/R $1.23 mio</td>
<td></td>
</tr>
<tr>
<td>- Revenue $1.23 mio</td>
<td></td>
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</tbody>
</table>

| Variance to Budget:                     | +$30,000            |

**Hedge: Sell 1MM EUR At 1.2020 EURUSD**

<table>
<thead>
<tr>
<th>T+ 6M Actual Rate: 1MM EUR 1.2300 EURUSD</th>
<th>$-28K Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Revenue $28K</td>
<td></td>
</tr>
<tr>
<td>- Cash $28K</td>
<td></td>
</tr>
</tbody>
</table>

| Variance to Budget:                     | +$2,000      |

Net Revenue = $1,202,000
Balance Sheet Exposure: FX Risk of monetary FX assets/liabilities

EUR 1,000,000 A/R Booked on USD Functional Entity

<table>
<thead>
<tr>
<th>Booking Rate: 1MM EUR At 1.2300 EURUSD</th>
</tr>
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<tbody>
<tr>
<td>▪ A/R $1.23 mio</td>
</tr>
<tr>
<td>▪ Revenue $1.23 mio</td>
</tr>
<tr>
<td>=&gt; $1,230,000 A/R</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Actual Rate at Cash Collection: 1MM EUR 1.1700 EURUSD</th>
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</thead>
<tbody>
<tr>
<td>▪ Cash 1.17 mio</td>
</tr>
<tr>
<td>▪ FX Loss $60K</td>
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<tr>
<td>=&gt; $60,000 FX Loss</td>
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<table>
<thead>
<tr>
<th>Variance to Booking Rate:</th>
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<tbody>
<tr>
<td>=&gt; -$60,000</td>
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Balance Sheet Exposure: FX Risk of monetary FX assets/liabilities

**EUR 1,000,000 A/R Hedged on USD Functional Entity**

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<th>Booking Rate: 1MM EUR At 1.2300 EURUSD</th>
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<tr>
<td>- A/R $1.23 mio</td>
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<td>- Revenue $1.23 mio</td>
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<tr>
<td>➞ $1,230,000 A/R</td>
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<th>T+ 1M Actual Rate: 1MM EUR 1.1700 EURUSD</th>
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<td>- Cash $1.17 mio</td>
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<th>Variance to Booking Rate:</th>
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<tbody>
<tr>
<td>➞ -$60,000</td>
</tr>
</tbody>
</table>

**Hedge: Sell 1MM EUR At 1.2310 EURUSD**

<table>
<thead>
<tr>
<th>T+ 1M Actual Rate: 1MM EUR 1.1700 EURUSD</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Cash $61K</td>
</tr>
<tr>
<td>- FX Gain $61K</td>
</tr>
<tr>
<td>➞ $61,000 FX Gain</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variance to Booking Rate:</th>
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<tbody>
<tr>
<td>➞ +$1,000</td>
</tr>
</tbody>
</table>
## Summary

### Objective: 1MM EUR At 1.2000 EURUSD

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Revenue</td>
<td>$1,230,000</td>
</tr>
<tr>
<td>Hedge + / -</td>
<td>-$28,000</td>
</tr>
<tr>
<td>Net Revenue</td>
<td>$1,202,000</td>
</tr>
<tr>
<td>Exposure</td>
<td>-$60,000</td>
</tr>
<tr>
<td>Hedge</td>
<td>$61,000</td>
</tr>
<tr>
<td>Net FX Gain / Loss</td>
<td>$1,000</td>
</tr>
<tr>
<td>Total Income Statement</td>
<td>$1,203,000</td>
</tr>
<tr>
<td>A/R Collection</td>
<td>$1,170,000</td>
</tr>
<tr>
<td>Hedge 1</td>
<td>-$28,000</td>
</tr>
<tr>
<td>Hedge 2</td>
<td>$61,000</td>
</tr>
<tr>
<td>Total Cash</td>
<td>1,203,000</td>
</tr>
</tbody>
</table>
Important Information for FX Transactions

Informational Purposes Only
This document and any other materials accompanying this document (collectively, the “Materials”) are provided by Wells Fargo Bank, N.A. (“we,” “our,” or “us”) for general information about the transactions described in the Materials. Although we believe that market data and other information contained in the Materials is reliable, it is not warranted as to completeness or accuracy, is subject to change without notice, and we accept no responsibility for its use or to update or keep it current. The Materials are not an offer or commitment for any products or transactions. Our willingness to enter into any transaction is subject to final credit approval, agreement on transaction terms and compliance to our satisfaction with all applicable legal and regulatory requirements, including onboarding and swap trading relationship documentation. Terms, rates, prices and structures in the Materials are indicative only, and should not be relied upon as the terms, rates, prices or structures on which we or anyone else would be willing to enter into, terminate or transfer a transaction with you, or relied upon for any other purpose. Actual rates and prices may be higher or lower depending on market conditions at the time of execution. Any historical information provided in the Materials is for information only, and past performance may not be relied upon as a guarantee of future results. Examples in the Materials are hypothetical only and are not a prediction of future results. There are frequently sharp differences between projections or forecasts and the actual results achieved.

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All transactions described in the Materials are arm’s length transactions to be negotiated by each party acting in its own best interests. The price and other terms of any transaction will be individually negotiated, and there is no assurance that they will represent the best price or terms available to you from us or other sources. Whether they are executable, indicative or illustrative, you should assume that any price we offer, quote or otherwise provide to you for entering into, transferring or terminating a transaction with Wells Fargo is strictly a Wells Fargo price and should not be considered a “market price” offered by anyone else in the relevant market. In this regard, please note that when we offer you an executable price for a swap with Wells Fargo, CFTC
Rule §23.431 requires that we also disclose to you the “mid-market mark” of the swap in order for you to assess the material incentives and conflicts of interest we may have in connection with the swap. Information about the mid-market mark and other material disclosures regarding swaps can be found at www.wellsfargo.com/swapdisclosures. The decision whether you should enter into any transaction upon mutually agreed terms rests solely with you. Before entering into any transaction described in the Materials, you should consider whether it is appropriate for you in light of your objectives, experience, financial and operational resources, legal capacity and authority, and other relevant circumstances, and you should conduct a thorough and independent evaluation of the financial, tax, accounting, legal and regulatory characteristics, consequences, costs and risks of the transaction in light of your particular circumstances, based upon the advice of your own financial, legal, tax, accounting, and other professional advisors. Neither we nor any of our affiliates will be providing any such advice in connection with any such transaction, and neither we nor they will be acting as your agent, broker, advisor or fiduciary in connection with any such transaction, whether or not we or they may otherwise be engaged to act in such capacity in connection with other products or services. Wells Fargo is not acting as your advisor pursuant to Section 15B of the Securities Exchange Act with respect to the Materials, and does not owe you a fiduciary duty.

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While transactions described in the Materials may be used for hedging purposes to reduce or eliminate certain risks associated with your assets or liabilities, the effectiveness of hedging may depend upon holding these transactions to maturity and not reducing or disposing of all or any portion of the asset or liability during the term of the hedge. If a transaction is terminated early, or if you reduce or dispose of all or a portion of the underlying asset or liability before the transaction matures (such as prepaying a foreign currency denominated liability or disposing of a foreign currency denominated asset you have hedged), depending on the nature of the transaction, you may incur a substantial loss or you may receive little or no hedging benefit from any upfront premium payment or any other costs incurred in purchasing the transaction. You may also incur a substantial loss if you enter into a transaction in anticipation of hedging an asset or liability that does not materialize. You should understand that significant potential amounts could become payable by you for modifying a transaction, terminating it early or transferring your position in the transaction to another person or entity, depending upon then existing market conditions. You should also consider that changes in or any disposition of your asset or liability (such as prepaying a foreign currency denominated liability or disposing of a foreign currency denominated asset) does not relieve you of your obligations under a transaction, which may be terminated early only in accordance with the terms of the swap trading relationship documentation (such as an ISDA Master Agreement or other master agreement) or other transaction documents, or otherwise by mutual agreement. Such termination may require payment by you of an early termination amount, which amount may be substantial. Whether you use a transaction for hedging or another purpose, you should satisfy yourself that you understand these and other risks relative to the benefits you are seeking to achieve and that the transaction and risks are suitable for you. These risks are discussed in greater detail in disclosures provided to you through the following website: www.wellsfargo.com/swapdisclosures.

Independent Obligation
To the extent any transaction described in the Materials may be used to hedge against foreign currency risks or other risks associated with a loan or financing, the transaction would be a separate and independent obligation and would not be contingent on whether or not any loan or financing closes, is outstanding or is repaid, in whole or in part, at any time, subject to any contractual requirement to terminate and settle the transaction early upon prepayment of the loan or financing or for other financing-related events. In addition, if you provide any existing or future collateral or other credit support to secure the transaction and any loan or financing, then you would be entitled to the release of such collateral or credit support only if certain conditions contained in the related collateral agreement or credit support document are completely satisfied for both the transaction and any such loan or financing, or we otherwise reach agreement with you on alternative collateral, credit support or other arrangements.
**Unmatched Terms & Conventions**

If the amount or duration of a foreign currency denominated asset or liability differs from that of a transaction used to hedge such asset or liability, you may be exposed to risk of loss from such over-hedging or under-hedging. If any other economic terms or characteristics of an asset or liability differ from those of the related hedge, then in addition to any losses that you could incur from such differences, the hedge may create unanticipated accounting exposure or tax liability for you. To the extent fair value accounting applies to the hedge, you may have to reflect unrealized gains and losses (i.e., the so-called “mark-to-market” value of the hedge) over the life of the hedge on your balance sheet and/or income statement. If hedge accounting applies, any ineffectiveness in the hedge resulting from such differences may likewise need to be taken into account and reflected in your financial results. These hedge valuation considerations may also be important to you for tax purposes, including any tax laws that may require unrealized gains or losses on hedges to be taken into account in determining your income tax liability. Conventions used for the underlying asset or liability and those in the swap or foreign exchange markets may differ, and we are under no obligation to ensure that any transaction we offer is a perfect hedge for the underlying asset or liability even if we provide you with both products. For example, if the method for determining the applicable exchange rate for a foreign currency denominated asset or liability differs from that for the exchange rate of the hedge, the payments associated with the underlying asset or liability could diverge from those of the hedge. Such divergence may occur by convention or as the result of contractual differences, such as in the definition or the reset timing of the exchange rate, the number of days in the payment periods, any applicable fallback exchange rate, or the rounding convention.

**Negative Interest Rates**

Express wording in swap transactions is required to place a 0% floor on LIBOR or other floating benchmark rate of the swap transaction, and no such 0% floor is included in an interest rate swap or other swap transaction unless mutually agreed between the parties as reflected in the swap confirmation. Absent such floor, if a Floating Amount is negative under an interest rate swap, the Floating Rate Payer does not make such payment. Instead, the Fixed Rate Payer pays the absolute value of the negative Floating Amount in addition to the Fixed Amount. See §6.4 of the 2006 ISDA Definitions, as amended. If you wish to acquire a swap with a 0% floor, this may increase the price of your swap as reflected in a higher Fixed Rate. For further information on negative interest rates, including their effect on swaps and the loans they are hedging, see Negative Interest Rates at: [www.wellsfargo.com/swapdisclosures](http://www.wellsfargo.com/swapdisclosures).

**Wells Fargo as a Counterparty**

Transactions described in the Materials are not bank deposits or FDIC insured, will expose you to the credit risk of Wells Fargo Bank, N.A., and therefore involve risk of loss to you apart from the market risk associated with the underlying rate, price or other economic measure on which the transaction is based. Financial information concerning Wells Fargo Bank, N.A. is available at: [https://www.wellsfargo.com/invest_relations/investor_relations](https://www.wellsfargo.com/invest_relations/investor_relations)

**Additional Information**

In addition to the information furnished above, you should not enter into any swap or other transaction described in the Materials without reviewing and understanding our “Disclosure of Material Information for Swaps” and accompanying documents available to you at: [www.wellsfargo.com/swapdisclosures](http://www.wellsfargo.com/swapdisclosures)

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