Unlocking the Hidden Power of a Corporate Balance Sheet

What will you now? (or have an idea about)

- How to engage a CEO in a balance sheet discussion
- How much cash is too much
- What is free lunch of risk management
- When having risk is a better than not having risk
- What is the best way to predict the future



Value Creation (DCF+)



What Cash Is Good For



But....



1 Based on overnight interest rate of 0.5% and inflation rate of 2%

How Much Could I Possibly Need?

In EURmm





Cash Balance



Example Company



Let's Have a Free Lunch



BRL Has Been Very Volatile In The Last 10 Years



Balance Sheet May Be Significantly Impacted by FX Rate Volatility -

Unhedged Value

EUR BRL



4.5

4.0

3.5

3.0

2.5

2.0

1.5

2018

22



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OR....

There is a clear trade-off between the volatility and economic value



Not To Hedge!

The objective is: highest value within maximum Risk Tolerance

Unhedged

	2010	2012	Diff
EUR mm	45	37	8
	2016	2018	Diff
EUR	29	22	7

Hedged

2010	2012	Diff
30	26	4
2016	2018	Diff



Low Volatility

Printed

How Much Risk To Manage?



Future CF Distribution (EUR mm)



A comprehensive scenario analysis

is needed to quantify the impact of future uncertainty on the business

"The Best Way To Predict The Future Is To Create It!"

Connect Macro Factors with Financial Markets Variables	Build Exhaustive Uncertainty	Model Business Performance on Each Path	Only Focus on the Outcomes That Matter
 GDP Unemployment Account Deficit Trade Balance Inflation 	 50k + scenarios Consistent across Macro and Markets Shocks, Dynamic Correlations 	 Revenues Net Income Key Credit Ratios EPS DVD Headroom 	 What leads to distress? What are the early signals? Which risks can be managed? How to be prepared for downturn?
60 55 50 45 40 35 30	5th Exp 95th	ocntl ected pcntl	

So, how do we use scenarios in practice? Let's consider some banking examples ...



... the first step is to break up the bank into individual chunks i.e., Lines-of-Business ...



Key guiding principles Model landscape development is guided by four key principles: Business view and

- risk drivers: Separately model businesses managed differently and/or with different risk drivers
- Data availability: Balance sophistication of landscape to best utilize available data
- Interdependencies:
 Consider
 interdependencies
- with other models e.g., credit loss to ensure smooth integration
- Materiality: Ensure appropriate balance of materiality and cost of modeling

Each cell can be multiple models (e.g., mortgage) based on materiality

		Projection approach				
			Challenger to 2020 Budget			
		Product	Balance	Spread	Losses	
		Mortgage	М	М	М	
1.000	Accoto	Personal Loans	J	J	M	
Potoil	etail	Credit cards	J	J	М	
Vetali		Overdrafts	J	J	М	
	Liphilition	Current accounts	M	M	М	
	Liabilities	Savings account	М	М	М	
		Commercial Banking	J	J	М	
	Assets	Sector & Specialist loans	М	М	М	
Commercial		CRE loans	М	М	М	
Sommercial		Base / LIBOR Linked	М	М	М	
	Liabilities	CCY deposits	J	J	M	
		Other deposits	J	J	М	
	Accete	On-shore Mortgages/loans	М	М	М	
	Assets	International Lending	J	J	М	
Ivale		On-shore Deposits	М	М	М	
	Liabilities	International Deposits	J	J	M	
	Loan Portfolio M M	М	М			
CIB	Assets	Global Transaction Services	М	М	М	
	Trading Book	NI	R Model			
	Global Transaction Services	М	М	М		
	Liabilities	Other (Inc Trading Book)	J	J	М	
		Equities	J	Perform	ance & flows	
Asset	Asset	Fixed income	J	Perform	Performance & flows	
management		Real estate	J	Perform	Performance & flows	
	Liabilities	Seed capital funding	M	M	M	

... for each of these Lines-of-Business the idea is to find a small number of risk drivers and use these risk drivers to understand potential performance under alternative scenarios ...





Historical Mortgages

- Expansion period from mid 2000s to start of financial crisis with a CAGR of 9.5%
- In aftermath of financial crisis growth rates are reduced considerably.
- Gradual increase afterwards leads to overall CAGR of 1.2%

Historical Deposits

- High growth from 2004 up until the end of the financial crisis, with a CAGR of 17.4%
- Decrease in deposits during economic recovery period from 2010 on, falling with a CAGR of -6.7%

Some immediate learnings emerge - fixed Mortgage Balance will drop severely compared to Baseline while magnitude depends on the House Price index scenario ...





- Fixed Mortgages, one of the drivers for net interest revenue, increased by a factor of 3 in the last decade
- 12 years of quarterly data were used for estimation, which captures one economic cycle
- Estimation period includes 2008 financial crisis and European sovereign debt crisis
- Fixed mortgage balances estimated via logarithmic changes to ensure stationarity (measured by ADF and other tests)
- Leveraged McKinsey toolset to assess 600+ potential predictors of balances
- Final model selection and assessment from a business perspective with co-located business experts and through expert panels

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... while Floating Mortgage balances will rise driven mainly by increasing affordability



Variables in model	Model (billion £)
 Nominal Wage growth - Hous Price Index growth (Quarterly Log Difference, Lag 1) 10Y British Government Bond Yield (Quarterly Difference) Unemployment Rate (Yearly Difference, Lag 1) 2 Year Swap Rate Spread ove 3m Libor (Yearly difference) 	Floating Mortgage Balances with Brexit Forecasts
 Fixed Mortgage Balance Base Rate 2 Year Swap Rate Spread over Base Rate 	0.004 200404 200502 2005024 2005024 2005024 2005024 2005024 2005024 2005024 2005024 2005024 2005024 2005024 2005024 2005024 2005024 2005024 2005024 2005022 2005024 2005024 2005022 2005024 2005022 2005024 2005022 2005024 2005022 2005022 2005022 2005024 2005022 2005022 2005022 2005024 2005022 2005022 2005022 2005024 2005022 200502 20050
 Total Mortgag heterogeneou In line with Fixe Other than for f the financial critical 	es were split into fixed and floating mortgages for estimation purposes in order to capture s behaviour over credit cycle for each segment ed Mortgages we are using 12 years of quarterly data for our model estimation ixed mortgage balances, we are seeing increases in balances during times of economic distress, sis and the sovereign debt crisis
 Floating Mortg Phillips Perron Model based of Statistical interf 	ages transformed to quarterly logarithmic differences to ensure stationarity – (measured by Al and KPSS) In business judgment and statistical correctness (e.g., t-tests, measures of goodness of fit) erence accounts for error autocorrelation by utilizing heteroscedasticity and autocorrelation

The challenge in developing these models is not so much the statistical methodology but the combination of statistics and expert inputs

- Full variable set: Start with set of >850 macroeconomic variables and apply various lags and transformations resulting in ~10,500 potential predictors
- Economic Variable Pre-selection: Using economic rationale, variables and transformations deemed not suitable to model iron and steel exports are removed
- Univariate Statistical Analysis: Regressing single macroeconomic variables on iron and steel export variables are removed based on univariate statistical analyses e.g., implausible coefficients, low explanatory power.
- Multivariate Statistical Analyses: Regress models with up to 3 macroeconomic variables on iron and steel exports. Models that contain insignificant variables or which fail relevant statistical tests e.g., for multi-collinearity are removed

- Economic Model Selection: Remove models that contain economically implausible combinations, such as models with only interest rate variables
- Expert Panels: Based on expert opinion the most appropriate models are selected. Decision criteria consist of economic intuition, business impact, statistical properties and model explanatory power



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While the "Optimal" portfolio maximized RoE under a base scenario, the "Stable" portfolio aims at maximizing RoE and maintaining it above a certain threshold, in a multi scenario context. The "Stable" portfolio targets the maximum possible RoE while limiting the downside, by tilting to a less volatile and more diversified asset allocation (e.g. reduction in trading book, increasing diversified corporate loans)

Assets

Derivatives

Net Trading Book

Corp. - Loans

Corp. - Structured

Investments &

Other assets

Commitments

CDS Sold

Finally, pulling all the individual components together and after adding a balance-sheet logic we can optimize the balance-sheet not only for maximum returns under baseline conditions, but also for stability of returns across a range of economic and regulatory scenarios



ILLUSTRATIVE -DUMMY NUMBERS

Stable in

multiple

scenarios

9.0%

5.0%

3.0%

0.3%

108%

114%

3.0%

10.5%

To design an optimised Financial Risk Mitigation strategy for Corporates we require six analytic steps supported by a dedicated toolkit which has some methodological challenges to be overcome

