Managing Risks from Aluminium to Zinc

A Technology Guide to Master the Commodity Risk Challenge

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Executive Summary

The responsibilities of the treasurer are expanding and commodity management is increasingly moving from procurement to treasury. In this paper, Reval demonstrates how technology can help treasurers better understand commodity exposures and more effectively implement hedging programs.

Introduction

Treasury is in different stages of transformation around the world, and what is included in treasury's remit is different too. There is a notable increase amongst multinational corporates for treasury to manage commodity risk. We have seen this at Reval, and a recent gtnews risk **survey**[1] indicates that 44% of treasurers are already responsible for commodity risk management.

This is the case for a few reasons:

- Greater need for global visibility of all financial risks
- Understanding the correlations amongst different asset classes
- Optimizing hedging strategies for significant cost savings
- Growing volatility of commodity prices around the world

Previously, many companies – commodity consumers – were reluctant to hedge commodity price risk as they believed their shareholders expected them to be fluctuating according to the market prices. However, the volatility and subsequent impact on the bottom line is no longer sustainable, and hence needs to be actively managed and hedged. Similarly, the banks that are financing those companies are not in favour of this volatility and are looking for more secure profit margins.

This is relevant not only for consumers and producers of commodities, but also for many organisations that have some exposures to non-financial items. For **example**, airlines are exposed to jet fuel and diesel, but also to emissions as

[1] gtnews: 2013 Treasury Risk Survey

About the authors

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they look to reduce their carbon foot print. Retailers are exposed to fuel costs for deliveries as well as many soft exposures – wheat in the cereal, in the biscuits, and in the beer they sell, for example. Beverage companies not only are exposed to the ingredients to make the beverage, but also the paper, aluminium and plastic costs.

Commodity exposure management is a complex area, but getting on top of commodity risks can have a significant financial impact. The following guide helps treasurers better understand what they need to determine the Return on Investment of commodity risk management:

1. Making exposures across the company visible
2. Monitoring and assessing risk correlations
3. Considering the impact of IFRS 9, IFRS 13, EMIR and Dodd Frank
4. Leveraging SaaS technology

Making Exposures across the Company Visible

Having a single solution that captures all of the exposures across the group is a key objective for many treasurers. Once a company identifies its interest exposures, commodity exposures, and foreign currency exposures, another challenge is dealing with multiple data systems as companies need to understand their exposures. For **example**, a risk manager of a UK based organization may need to consider the FX risk associated with those commodity exposures. This company might be buying or selling commodities that are routinely denominated in USD, whereas their functional currency may be GBP, bringing on more FX risk that needs to be managed and hedged. Treasury and Risk Management (TRM) solutions delivered as an all-in-one Software-as-a-Service solution with advanced commodities capabilities (i.e. not just FX or interest modules of a TMS) will be able to capture the commodity exposures in terms of notional quantity (tones, barrels, pounds etc.) and determine the price risk (relating to expectations as noted below) and the associated FX risk, automatically. This ensures that FX hedging policies are really being applied to all FX exposures across the group.

About Reval

Reval is a leading, global Software-as-a-Service (SaaS) provider of comprehensive and integrated Treasury and Risk Management (TRM) solutions. Our cloud-based software and related offerings enable enterprises to better manage cash, liquidity and financial risk, and includes specialized capabilities to account for and report on complex financial instruments and hedging activities. The scope and timeliness of the data and analytics we provide allow chief financial officers, treasurers and finance managers to operate more confidently in an increasingly complex and volatile global business environment.

Using Reval, companies can optimize treasury and risk management activities across the enterprise for greater operational efficiency, security, control and compliance. Founded in 1999, Reval is headquartered in New York with regional centers across North America, EMEA and Asia Pacific.

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Constant monitoring is required as any slight changes in commodity forecasts will alter FX exposures and thus both will need to be actively managed. Keeping commodity price risk in procurement and FX risk in treasury may result in companies missing this exposure.

Determining the quantity of the exposures is necessary, but also important is the forecasting of prices. Quotable indices for commodity prices are not 100% correlated to physical prices given basis differences such as location factors and grade and quality features. It is common, therefore, to model the historical pricing trends and predict future prices on that basis. This is only possible with a SaaS TRM solution that can examine price correlations and build out future curves based on this analysis. This kind of analysis is also invaluable for the mechanics of hedge accounting as noted below.

Monitoring and Assessing Risk Correlations

Many companies are missing out by not considering correlations amongst the asset classes. In recent **surveys** it was found that as much as 40-50% of the cash flows at risk of a company that has exposures to multiple interest rates, foreign currencies and commodities can be reduced just by considering the correlations amongst the asset classes. SaaS TRM solutions that have built-in Cash flow at Risk (CFaR) modelling capabilities facilitate the monitoring of the correlation impact and the determination of any natural hedges in place and residual risk left to be hedged. Following on from this, companies can then perform what-if analyses and stress tests to determine the impact by just hedging one or two of the significant contributors to that risk and assessing the overall potential impact on the bottom line. This too is not a one-off exercise that companies can pay a consultant to do at the start of the hedging policy. In today's volatile market and the uncertainty many companies are facing around their highly probable cash flows, correlations need to be monitored regularly as they too can change or be broken due to market factors outside of the company's control.

Below is an illustration of how CFaR can be used for a multinational company with multiple asset class exposures.

CFaR of portfolio of exposures across the asset classes on a standalone basis i.e. ignoring correlation

- This shows us that based on the portfolio of exposures you have a 5 % chance that your cash flows will be –EUR19.6m and a 95% chance that they will be +EUR18.5m. It appears that the exposure that is contributing to this the most is the Aluminum in USD.

# of Trades	Reporting Cu	Asset Type	Denomination	Mean 29.02.12	5th percentile	95th percentile	% of risk on 5th percentile
1	Functional	Grain	USD	-4,928.89	-808.2	726.92	0%
2	Functional	ICE - Agricultu	USD	-31,922,249.11	-3,174,405.39	3,035,180.86	16%
1	Functional	ICE - Energy a	GBP	-263,074.47	-94,588.06	75,186.77	0%
2	Functional	ICE - Energy a	USD	-12,677,082.99	-3,855,305.51	3,142,034.24	20%
1	Functional	Foreign Exchi	ARS	682,188.56	-39,447.56	42,822.88	0%
5	Functional	Foreign Exchi	AUD	13,897,349.93	-1,620,615.56	1,773,111.32	8%
2	Functional	Foreign Exchi	CHF	2,949,663.15	-363,149.52	390,712.98	2%
2	Functional	Foreign Exchi	GBP	28,846,134.91	-1,516,639.91	1,491,594.09	8%
1	Functional	Foreign Exchi	JPY	32,535.09	-3,011.70	3,240.78	0%
1	Functional	Foreign Exchi	NOK	599,986.45	-29,427.58	31,018.80	0%
1	Functional	Foreign Exchi	PLN	5,241,557.40	-397,530.40	424,973.10	2%
2	Functional	Foreign Exchi	RUB	489,857.04	-29,494.73	29,275.86	0%
2	Functional	Foreign Exchi	USD	45,012,308.70	-2,301,378.70	2,459,696.30	12%
2	Functional	Foreign Exchi	ZAR	5,475,059.21	-528,946.77	541,754.91	3%
2	Functional	Interest Rate	EUR	-182,654,392.96	-570,391.04	473,376.96	3%
1	Functional	Aluminum	USD	-30,148,723.45	-5,095,324.55	4,633,875.45	26%
				-154,443,811.43	-19,620,465.18	18,548,582.22	

Source: Reval

Note above that 26% of the potential cash at risk resides in the US-based Aluminium price risk (at the 5th percentile). More specifically, the model sees a 5% chance of an additional cash loss of $5m EUR over and above the expected mean outcome.

# of Trades	Reporting Cu	Asset Type	Denomination	Mean 29.02.12	5th percentile	95th percentile	% of risk on 5th percentile
1	Functional	Grain	USD	-4,928.89	587.41	248.38	0%
2	Functional	ICE - Agricultu	USD	-31,922,249.11	-605,117.02	1,768,769.86	7%
1	Functional	ICE - Energy a	GBP	-263,074.47	-32,075.65	-26,247.31	0%
2	Functional	ICE - Energy a	USD	-12,677,082.99	-3,319,154.76	3,314,704.74	41%
1	Functional	Foreign Exchi	ARS	682,188.56	4,690.19	33,791.38	0%
5	Functional	Foreign Exchi	AUD	13,897,349.93	-705,621.81	-2,282,124.18	9%
2	Functional	Foreign Exchi	CHF	2,949,663.15	-79,024.02	-292,808.02	1%
2	Functional	Foreign Exchi	GBP	28,846,134.91	-451,651.91	220,205.09	6%
1	Functional	Foreign Exchi	JPY	32,535.09	-1,816.63	3,931.38	0%
1	Functional	Foreign Exchi	NOK	599,986.45	-13,514.64	-39,084.45	0%
1	Functional	Foreign Exchi	PLN	5,241,557.40	-382,267.40	-185,525.40	5%
2	Functional	Foreign Exchi	RUB	489,857.04	13,159.93	-20,931.06	0%
2	Functional	Foreign Exchi	USD	45,012,308.70	188,981.30	2,162,231.30	-2%
2	Functional	Foreign Exchi	ZAR	5,475,059.21	48,756.41	-567,276.52	-1%
2	Functional	Interest Rate	EUR	-182,654,392.96	-484,503.04	-320,887.04	6%
1	Functional	Aluminum	USD	-30,148,723.45	-2,312,964.55	4,086,541.45	28%
				-154,443,811.43	-8,131,536.19	7,855,539.60	

CFaR of portfolio of exposures across the asset classes on a portfolio basis i.e. incorporating correlation

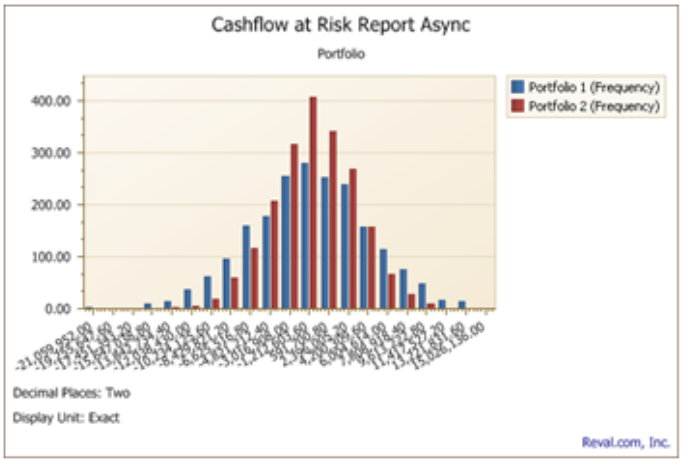
- This shows us that your worst case scenario is reduced from –EUR19.6m to –EUR8.1m by considering correlation between the asset classes. In this case, as much as 60% of your risk has been reduced just considering correlation. We normally find between 40% and 60% of the risk is reduced when considering correlation.

Original worst case scenario based on standalone method	-19,620,465.18
Revised worst case scenario based on portfolio method	-8,131,536.19
Therefore reduced exposure by considering correlation	-59%

Source: Reval

Once the model incorporates correlations in the market, we see a marked improvement in the overall potential cash loss at the 5th percentile of 59%. The big risk associated with Aluminium has also reduced significantly from a potential loss of $5m EUR to a loss of only $2.3m. This is a good example of why taking into account correlations can be very powerful. As there are often significant natural hedging opportunities across the portfolio the actual exposure to be hedged can be reduced.

When risk managers decide to hedge, decision makers often want to view the risk profile pre and post hedge – this is where scenario or 'what-if' analysis are useful. Below we can see two portfolios compared under the CFaR model – one pre-hedge and one post-hedge.



Portfolio 1 – exposures only
Portfolio 2 - exposures and hedge

Analysis:
This analysis indicates that by hedging your commodity exposure to Aluminum you have reduced your tail risk as can be noted above by comparing Portfolio 1 and Portfolio 2 histograms. The following slide provides the absolute savings.

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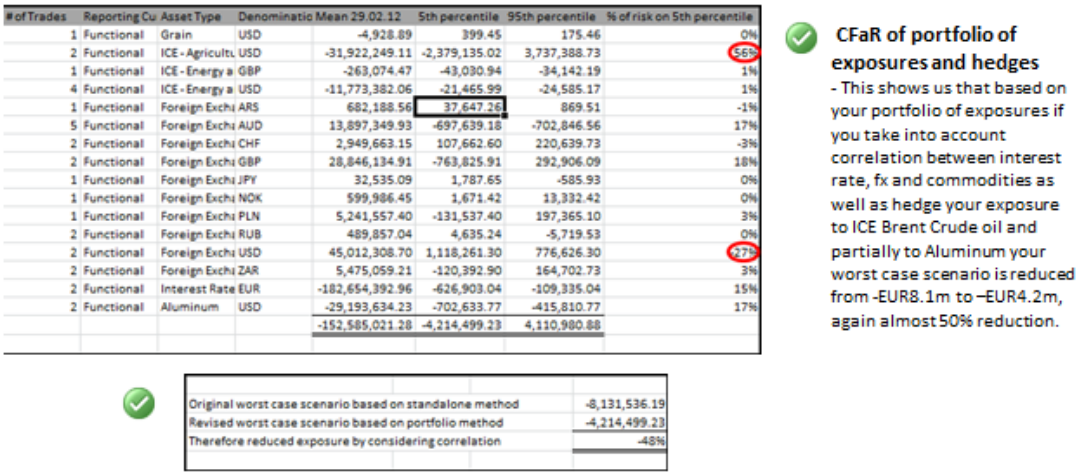

# of Trades	Reporting Cu	Asset Type	Denominatio	Mean 29.02.12	5th percentile	95th percentile	% of risk on 5th percentile
1	Functional	Grain	USD	-4,928.89	399.45	175.46	0%
2	Functional	ICE - Agricult	USD	-31,922,249.11	-2,379,135.02	3,737,388.73	56%
1	Functional	ICE - Energy a	GBP	-263,074.47	-43,030.94	-34,142.19	1%
4	Functional	ICE - Energy a	USD	-11,773,382.06	-21,465.99	-24,585.17	1%
1	Functional	Foreign Exchi	ARS	682,188.56	37,647.26	869.51	-1%
5	Functional	Foreign Exchi	AUD	13,897,349.93	-697,639.18	-702,846.56	17%
2	Functional	Foreign Exchi	CHF	2,949,663.15	107,662.60	220,639.73	-3%
2	Functional	Foreign Exchi	GBP	28,846,134.91	-763,825.91	292,906.09	18%
1	Functional	Foreign Exchi	JPY	32,535.09	1,787.65	-585.93	0%
1	Functional	Foreign Exchi	NOK	599,986.45	1,671.42	13,332.42	0%
1	Functional	Foreign Exchi	PLN	5,241,557.40	-131,537.40	197,365.10	3%
2	Functional	Foreign Exchi	RUB	489,857.04	4,635.24	-5,719.53	0%
2	Functional	Foreign Exchi	USD	45,012,308.70	1,118,261.30	776,626.30	27%
2	Functional	Foreign Exchi	ZAR	5,475,059.21	-120,392.90	164,702.73	3%
2	Functional	Interest Rate	EUR	-182,654,392.96	-626,903.04	-109,335.04	15%
2	Functional	Aluminum	USD	-29,193,634.23	-702,633.77	-415,810.77	17%
				-152,585,021.28	-4,214,499.23	4,110,980.88	

CFaR of portfolio of exposures and hedges
- This shows us that based on your portfolio of exposures if you take into account correlation between interest rate, fx and commodities as well as hedge your exposure to ICE Brent Crude oil and partially to Aluminum your worst case scenario is reduced from -EUR8.1m to –EUR4.2m, again almost 50% reduction.

Original worst case scenario based on standalone method	-8,131,536.19
Revised worst case scenario based on portfolio method	-4,214,499.23
Therefore reduced exposure by considering correlation	-48%

Source: Reval

The graphic shows how the desired hedging strategy has reduced the overall CFaR exposure by yet another 48% to potentially a level of exposure that management is comfortable with.

As noted above, best practice today is to look at commodity exposures and FX exposures together. This is because global manufacturers are usually short commodities and long currencies (selling product globally). It is useful to group currencies together, e.g. dollar bloc, yen bloc, euro bloc, commodity bloc, as commodities can be negatively or positively correlated to different currencies; for example, base metal (copper, steel, and aluminium) prices are correlated with AUD, BRL and ZAR. Along with long currency and short commodity positions, correlations often create natural hedges, which can mitigate the need for hedging in some cases. For commodities that can't be hedged, this can be particularly helpful, for example to vehicle manufacturers or metal fabricators selling globally.

Considering the Impacts of IFRS 9, IFRS 13, EMIR and Dodd Frank

Today, hedge accounting for commodity exposures is not easy. One of the fundamental reasons for this is the inability of a company to hedge a component of its non-financial risk exposure. All risks, or just the FX risk, are permitted to be the designated risk in a non-financial hedged item, hence the need as noted above to be able to understand (and model) entire exposures and all risks related to those exposures. Companies need to have a hedge accounting solution that facilitates the capturing and monitoring of this basis risk as it will alter the accounting outcomes.

Overall, there are four regulations that impact commodity risk management significantly:

IFRS 9 - Those companies permitted to early adopt the very long awaited IFRS 9 chapter on hedge accounting can get some relief to hedge their non-financial exposures. For those companies, it is now possible to only hedge a component of their non-financial items, if it is separately identifiable and readily measurable.

IFRS 13 - In order to comply with IFRS 13 commodity hedgers have to ensure that their derivative positions are valued according to the new definition of fair value, which requires both credit risk (that of your counterparty) and non-performance risk (the company's own credit risk) to be quantified and reported on.

EMIR and Dodd Frank –The European EMIR regulation and its US counterpart Dodd Frank govern the use of derivatives and reporting requirements.

An all-in-one SaaS TRM solution enables companies not only to view risk holistically, but also to adapt nimbly to the ever changing regulatory requirements.

Leveraging SaaS Technology

Due to the change in ownership of managing commodity price risks companies are looking for one solution to house all exposures and to leverage advanced risk management functionality to better optimize hedging strategies. Treasurers have a greater desire for a single solution that manages both treasury and risk on the same platform, rather than conventional TMS's or spreadsheets. The impending accounting and regulatory changes mentioned above indicate some of the reasons why the Software-as-a-Service delivery model is becoming the preferred option, allowing companies to focus on their business needs rather than on deciding which patches or which upgrades they need and rewriting yet another business plan to secure more funding for a compliant solution. With SaaS technology, accessibility anywhere at any time via a web browser ensures every single user on the platform's community is working in the same environment and on the latest software version. When addressing changes in regulation, upgrades are done seamlessly and effortlessly and are available to all users of the TRM solution in a timely fashion. The other significant advantage is that an integrated platform provides reliable market data that is often difficult to obtain through traditional market sources and is often very costly, particularly for commodities.

Conclusion

With the aid of advanced analytics and SaaS solutions to perform Treasury and Risk Management, companies are able to have a holistic view of risk. They are able to work collaboratively across the enterprise to gain the visibility they need to understand and monitor their exposures, decide the optimal hedging strategy and better communicate their results and strategies to key stakeholders. In this way, treasury is increasingly becoming a more strategic advisor to the company and ultimately sitting at the financial nerve centre of the organization. Utilizing advanced techniques like Cash Flow at Risk, companies can understand the interaction between risks and obtain actionable hedge recommendations to optimize, minimizing CFaR within limits of hedge cover targets. This same approach can also be used to validate hedge cover targets to ensure that they result in optimal risk management. With SaaS TRM technology and the sophisticated analytics needed to manage risk holistically, companies can avoid being left behind by not considering all risks on a centralized and globalized basis.

