# A Regressive Approach to Hedge Accounting at Novelis

by Louis W. Edwards, Director, Derivative Accounting and Reporting, Novelis

**One of the more important decisions to be made during the life of a hedge is how to assess its effectiveness. Both ASC 815 (FAS 133) and IAS 39 require companies to assess hedge effectiveness at the inception of the relationship and on a periodic basis throughout its life. This requirement includes a forward-looking prospective assessment and a backward-looking retrospective assessment. Choosing the right method is important because if your test results fail to meet the criteria you establish for them, you must discontinue hedge accounting for that hedge and changes in fair value must be recognised in earnings. Moreover, once you have selected a method, you cannot change it without de-designating the hedge relationship.**

Companies may elect to forgo periodic effectiveness testing by asserting that the critical terms of the exposure match those of the derivative. The problem with this method is that auditors and regulators have taken a very narrow definition of the term 'match'. A payment date that is different by as little as one day may make the critical terms match method inappropriate. Many companies have been burned by using critical terms match and then being told by their auditors or the SEC that the method was inappropriate. This has led to more than a few financial restatements.

Given the risks of the critical terms match, many companies now use the dollar offset method as their default method for assessing hedge effectiveness. The popularity of this method arises from its ease of use. The change in the value of the derivative is compared to the change in the value of the hedged item. If the ratio of the two changes lies within a predetermined range - say 80% to 125% - the hedge may be deemed to be highly effective.

## Small changes, big problems

The risk of the dollar offset method is that a seemingly good hedge can fail this test without warning, especially if markets are relatively stable. Assume you have $500m in variable-rate debt, hedged with an interest rate swap. If the derivative changes in value by $15,000 and the hedged item changes by $10,000, the hedge will fail because the ratio of the two changes falls outside of the 80-125 range. It does not matter that both changes are small relative to the notional amount. This can be frustrating when you know that most of the time, the hedge would have been effective, but dollar offset is not a 'most of the time' method of testing.

Companies not wanting to bear the risks associated with critical terms match or the dollar offset method are increasingly turning to regression analysis to assess hedge effectiveness. Regression analysis is a statistical method where changes in the derivative and changes in the hedged item are measured at regular intervals over time and a line is mathematically drawn through the measurements. The slope of that line is an important output; it represents the overall ratio of derivative to hedged item. It is like doing a series of dollar offset tests and then averaging the results. Therefore, a few measurements may fall outside the range without causing the

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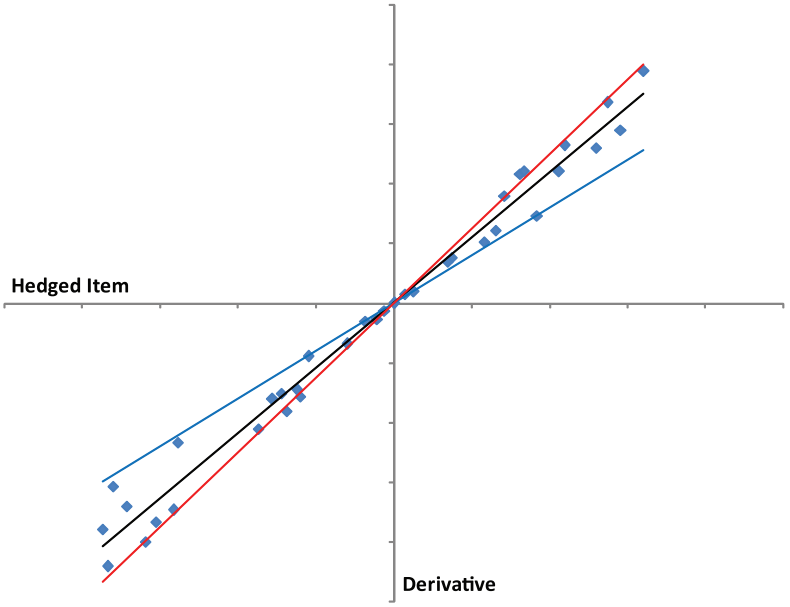
Regression analysis, however, is more complicated than dollar offset and can be confusing to set up. You must specify the number of samples to be used, the sampling frequency, whether measurements will be made on a periodic or cumulative basis, and what range of slope values will constitute a highly effective hedge. Because regression analysis is a statistical technique, it is also important to assess how strongly the data support the conclusion and whether or not the results could merely be the effect of random chance. For this, you must specify limits for R-squared and either the F-statistic or T-statistic. While it is possible to perform these calculations in a spreadsheet, if you have more than one or two hedges, it may be a good idea to find a system to maintain the underlying data and to perform the mathematical heavy lifting.

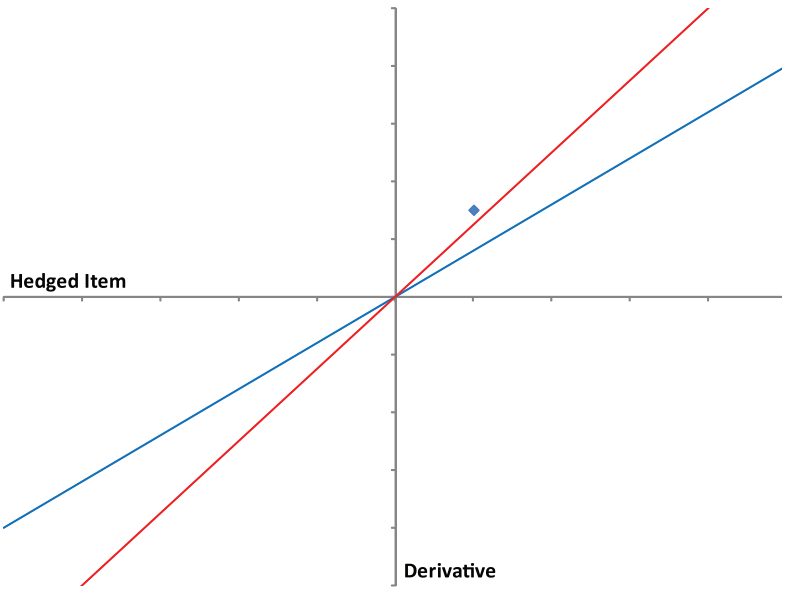
## Practical application

As the largest supplier of flat-rolled aluminium products and the largest recycler of used beverage cans in the world, Novelis has significant exposures to commodity and energy prices, exchange rates and interest rates. We manage these exposures through an active programme of derivative

### Chart 1 – Regresion Analysis Method




### Chart 2 – Dollar Offset Method




**The dollar offset method compares the change in the derivative with the change in the hedged item. If the ratio falls outside the 80% to 125% range, then the hedge fails high effectiveness testing. Regression analysis compares the slope of a line, drawn mathematically through a series of measurements taken at different times, to the 80% to 125% range. It is possible for individual measurements to fall outside the range without causing the hedge to fail.**

transactions. Given that the notional value of these programmes is greater than 50% of annual revenue, it is critical that we account for them properly.

Novelis has used Reval® since 2005. Initially, we used the system to support hedge accounting for our interest rate swaps and long-term energy contracts. In 2008, as a part of our adoption of FAS 157, we expanded our use of Reval to include the valuation of more than 10,000 metal and exchange rate derivatives, which we account for as economic hedges at fair value through profit and loss.

Novelis has two credit facilities of almost $2bn (US), which are priced at LIBOR plus a spread. Under these facilities, we have the option to reset the interest rate calculation basis from 1-month to 3-month LIBOR. That means that on a given day each month, we may elect to set the rate for the following month at that day's 1-month LIBOR rate. Alternatively, at quarter end, we may elect to lock the rate in at 3-month LIBOR for the following quarter, after which time we would again choose either a 1-month or 3-month reset period. At each reset date, we consider the spreads and take an active view on whether a 1-month or 3-month reset would be most economic.

Despite the flexibility in this arrangement, we wanted to further reduce our exposure to interest rate fluctuations and so elected to swap the majority of our debt to fixed rate using interest rate swaps with a variable leg that reset against 3-month LIBOR on a quarterly basis. Assessing hedge effectiveness in this case is not straightforward. Although the LIBOR rates of the loan and the swap generally track each other, they are not linked; moreover, the spread also changes and could even reverse in certain market conditions. To counter this, we conduct our effectiveness testing on the assumption that, if our only option was to base our interest rate exposure on 3-month LIBOR, the hedge would be more effective than if we could only re-price our debt monthly using 1-month LIBOR. We therefore set up our hedge relationship to compare a quarterly interest rate swap with a term borrowing with monthly resets, and apply regression analysis to establish the changes in the relationship over a period of time.

Reval has made the process of using regression analysis relatively easy. When we set up the hedge designation, we select regression analysis for both prospective and retrospective testing and specify the number of measurements and their frequency - in our case, we chose 36 months. We also establish limits for slope (80% to 125%), R-square (at least 80%), and the F-statistic and T-statistic appropriate for our sample size and our desired 95% confidence level. To perform our initial prospective assessment, Reval creates proxy trades for the derivative and the exposure. These will be backdated by 37 months and their valuations will be measured at monthly intervals using historic market data. The system generates the regression results which it then compares to the limits we established; this determines whether the hedge passes or fails.

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We use regression analysis as a dual-purpose test, combining prospective and retrospective testing into a single process. Each month, the system replaces the oldest backdated values with current values and regenerates the results. We can see at a glance, whether or not each hedge is effective and we can identify any hedges that may be at risk of failing in the future. This is a highly efficient process.

Using regression analysis will not guarantee that our hedges will always be effective, nor can it make a bad hedge look good, but we believe it reduces the risk of false failure inherent with the dollar offset method. From Novelis' standpoint, the fact that Reval supports regression analysis and allows us to have a highly efficient closing process is a double-win. As we consider applying hedge accounting to our metal and foreign exchange derivatives, we expect that we will continue to use regression analysis for effectiveness testing. ■

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Louis Edwards is Director of Derivative Accounting and Reporting at Novelis Inc. He holds a B.S. in Accounting from Case Western Reserve University and is a CPA. He has extensive experience providing financial and systems management to major industrial companies.

**Novelis Inc.**

Novelis Inc. is the global leader in aluminium rolled products and aluminium can recycling. The company operates in 11 countries and revenue of $8.7bn in its 2010 fiscal year. The company supplies premium aluminium sheet to automotive, transportation, packaging, construction, industrial and printing markets throughout North America, South America, Europe and Asia. Novelis is a subsidiary of Hindalco Industries Limited which is a flagship company of the Aditya Birla Group, a multinational conglomerate based in Mumbai, India.