

Oxford Energy Comment

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Value or Volume?

by Robert Arnott

The booking of oil and gas reserves is an inexact science. First, many technical variables need to be taken into account to establish the volume. Then, economic parameters are superimposed on this volume in order to calculate the 'proved' reserves that can be produced at current prices. This volume is then reported in the year end financial statements and is widely accepted as gospel truth. So much so that, of all of the factors that drive share price movements, changes in the volume of 'proved' reserves have the most influence. It is therefore no surprise that, when Royal Dutch recently decided to 'recategorise' 20 per cent of its proven reserves base, the equity market reaction was so negative.

There is, of course, no excuse for internal inconsistency within any one company with respect to the booking of reserves. But equally the focus on 'proved' reserves is not a true reflection of the total oil and gas resource base. In the case of Royal Dutch, the 20 per cent reduction in the 'proved' reserves base does not mean that the reserves have simply disappeared. No, the reserves are still there and they still have an implicit value. In fact, the company explicitly stated that the recategorisation of proved reserves did not materially change the estimated total volume of hydrocarbons in place, nor the volumes that are expected ultimately to be recovered. In addition, the company also stated that the change in 'proved' reserves would not have a material effect on financial statements for any year up to and including 2003 and that the recategorisation would not have a material impact on hydrocarbon production in the near term. Therefore, it could be argued that the value of these reserves has not changed if the timing of their development has not been deferred.

Of course the stringent rules on 'proved' reserves booking were put in place to protect investors from unscrupulous companies inflating expectations with largely fictional data. But it should always be remembered that 'proved' reserves represent just a peak through the window into the warehouse containing a company's total oil and gas reserves base. Look through the window beyond the 'proved' reserves and you will find 'probable' reserves, 'possible' reserves, 'unconventional' oil, and even 'undiscovered' potential on unexplored acreage. The proportion of 'proved' reserves, those on sale today, in relation

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to the total asset base will differ significantly from one company to another. Unsurprisingly, companies rarely allow you into the warehouse.

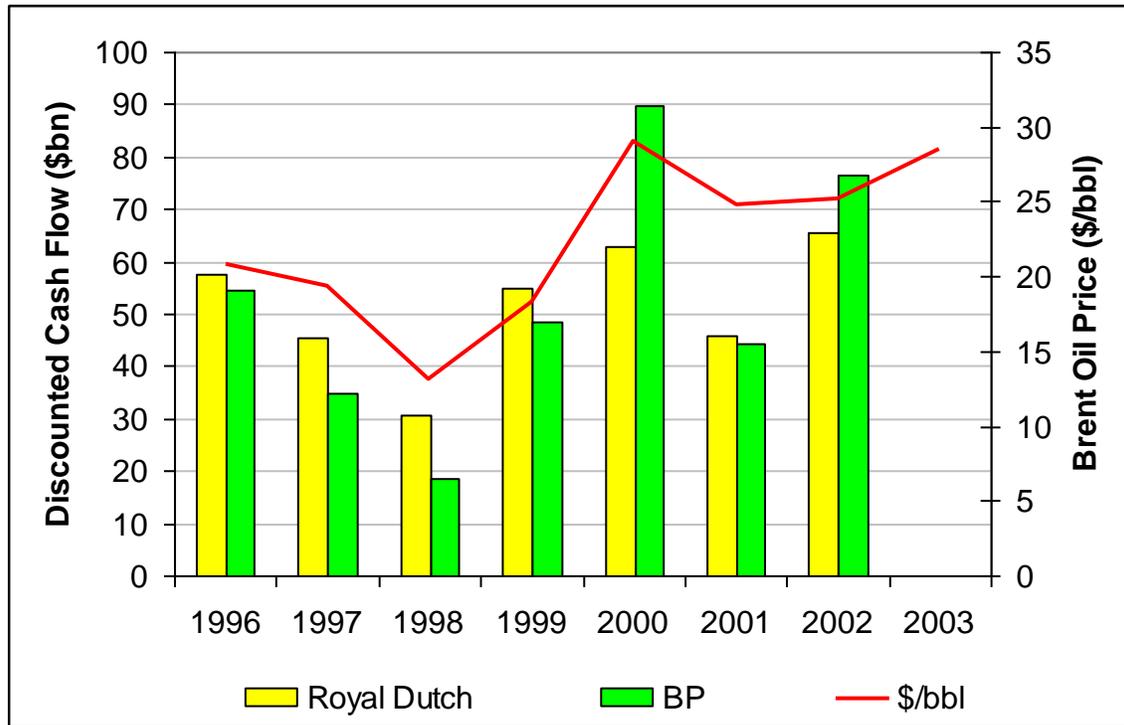
There is also the fundamental question of what is more important, the volume of reserves or their value? The time lag between discovery and production in the upstream oil industry runs to years, and results in serious distortions between the timing of success or failure and its reflection in published financial statements. In addition, if oil prices rise then this presumably has an impact, not only on the value that the market should apply to the much larger volumes of reserves that are in the ground and which will only be produced in future years.

McCormack and Vytheeswaran pointed out (*Journal of Applied Corporate Finance*, Volume 11, Number 3, 1998) that fluctuations in the shareholder wealth of the 25 largest firms, taking into account variations in the underlying value of the 'proved' reserves base, explains 49 per cent of those movements. In simple terms, and quite logically, if the value of the reserves base increases, relative to the amount of capital invested during the period, there should be a relative increase in the value of the company and vice versa.

Of course it is difficult for anyone outside the company to gain access to this sort of data. But for those companies listed on the New York Stock Exchange it is possible to extract an approximation for the required figures from these filings. The US Securities and Exchange Commission (SEC) require all companies to calculate the value of their oil and gas reserves, and to reconcile those movements in value from one year to the next.

This sounds ideal but the assumptions that the SEC requires companies to apply are such that they significantly undervalue their reserves, relative to the value that the equity market would place on them. The methodology requires the use of year-end prices and costs, restricts the calculation to proved reserves, and requires the application of a 10 per cent discount rate. In contrast, the equity market values would include some element for probable and possible reserves, would make use of consensus forward prices and, possibly, a lower discount rate. Nevertheless, changes in the year-end values can give a good indication of whether value has been added or destroyed.

Figure 1: Reported Discounted Future Cash Flows 1996 to 2002



Source: Company 20-F Reports

Figure 1 plots the value of the ‘proved’ reserves base for Royal Dutch and BP as well as the Brent Oil price and shows quite clearly how the underlying value of the reserves is influenced by changes in the oil price. The rise in value for BP between 1998 and 2000 reflects not just an increase in oil price but also the incorporation of reserves as a result of several mergers. Also for Royal Dutch, the increase in 2002 incorporates an acquisition, that of Enterprise Oil. The fall in values between 2000 and 2001 highlights the fact that BP’s portfolio is more geared to changes in the oil price than that of Royal Dutch.

However, for Royal Dutch, the equity market faces a paradox on how to square up to the fact that the discounted value of the cash flows at the end of 2003 might actually be higher than the value at the end of 2002, even including the reserves downgrade. The company stated that the reserves downgrade will lead to a 10 per cent reduction, equivalent to around \$6.5 billion, from the standardised discounted cash flow value reported at the end of 2002. However, if the company achieves the same increase in margin as it did in 2000 when oil prices rose to average \$29/bbl, the value of the reserves would rise by some \$7.1 billion. So should the share price really have fallen by so much?

Well, for the investor, one way of ascertaining whether a company is performing well is to judge whether the conveyor belt that moves reserves out of the warehouse (‘unproved’) and into the shop window (‘proved’) is moving fast enough to replace the goods being sold (‘production’). In an uninterrupted chain, there are no fears about supply but when goods have to be returned to the warehouse, as was the case with Royal Dutch (and to be fair other companies over the past ten years), this can lead to real fears,

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not just about what is in the warehouse and how much it is worth but also about whether future supply can be assured. In such circumstances, strong arguments over value have little sway over negative sentiment on volume.

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