

## BHP Portfolio Risk Management - A New Market Risk Management Strategy

December 2000

### Overview

- BHP has conducted a comprehensive review of its strategy in relation to market price risks, including commodity price risk, foreign exchange risk, interest rate risk and freight risk. The Board has approved a new market risk management strategy, **Portfolio Risk Management**.
- **The new market risk strategy supports BHP's portfolio business model, is based on extensive quantitative analysis of the risks and opportunities in the BHP portfolio and applies leading financial markets analysis to a portfolio of natural resource assets.**
- The objective of the new strategy is to support the delivery of BHP's financial targets while protecting the Company's future financial security and flexibility.
- The strategy entails managing risk at the portfolio level through the adoption of a 'self insurance' model. This means using the '**natural hedges**' provided through the scale, diversity and flexibility of the portfolio as the principal means for managing risk. Further, **BHP will bear the residual market risk** (that risk net of the natural diversification) rather than engage in hedging of this risk. Hedging programs will be effectively discontinued and existing hedge positions allowed to 'run off'.
- Market Risk will be managed within a quantitative 'Cashflow at Risk' (CFaR) framework. This is described in more detail in the paper.
- **The strategy does not imply that BHP will *never* hedge its market risk.** There may be circumstances, such as following a major acquisition or price shock, when it becomes appropriate to mitigate risk in order to support the Company's broader strategic objectives. In such circumstances, BHP may execute hedge transactions. Based on the Cashflow at Risk analysis of the corporate business plan, this will not be a requirement for the foreseeable future.
- BHP may infrequently and to a limited extent enter into strategic financial transactions when there is perceived to be a significant under or over valuation of a commodity market represented within the BHP portfolio. Such transactions would be treated separately from any hedging transactions. They would be strictly controlled under a separate Stop-Loss and Value at Risk limit framework.
- The strategy emphasises **a commitment to communicating to stakeholders in a clear, precise and responsive manner**. BHP will communicate in some detail its approach to managing market risk, together with up-to-date information on the Company's risk profile and the implication of that profile for future earnings and cashflow.

## Strategic Review of Market Risk

The Strategic Review of BHP's market risk was undertaken as part of the establishment of clear, disciplined and rigorously based portfolio risk management tools, to support the implementation of BHP's portfolio management model. The work complements and builds upon the establishment of capital disciplines for the approval of capital projects, and major transactions, as well as ongoing work on country risk management.

Historically, BHP has undertaken hedging of its main commodity exposures (oil, copper), while also having a major currency hedging program in place. The market risk review was dictated by a desire to determine the necessity and efficacy of hedging activities in the context of total portfolio risk, rather than a business unit-based perspective of risks to cash flows or budgetary outcomes.

As part of this development, a new corporate function was established – Market Risk Management – and was tasked with conducting a comprehensive review of BHP's historic approach of smoothing earnings using financial derivatives. The review involved research and analysis including:

- detailed quantitative modelling of BHP's existing and potential portfolio of risk exposures, including extensive scenario analysis and stress-testing, using a three-year 'Cashflow at Risk' (CFaR<sup>1</sup>) model based on the corporate business plan;
- analysis of the dynamics of key financial and commodities markets for BHP;
- review of the effectiveness of the historic approach to hedging activities;
- extensive benchmarking of peer group practices and case studies from other industries; and
- independent analysis of BHP shareholder profiles as basis for assessing their risk preferences.

The research and analysis led to the following conclusions:

- BHP has a significant degree of risk mitigation through the natural diversification of its portfolio.
- The residual market risk in BHP's portfolio, when added to other risk categories (country, operational etc), does not represent a significant exposure to the overall corporate strategy. This has been tested by linking the CFaR model to BHP's business planning model to obtain cashflow, profit and loss and balance sheet information under various simulations.
- There is no clear evidence that reducing cashflow volatility benefits shareholders or is an attribute sought in determining investment choice for resources companies.
- Share price reflects corporate strategy. Value is ascribed to risk management only in so far as it supports the corporate strategy, is clearly communicated and consistently applied.
- Given BHP's exposure profile, a continuation of hedging would likely incur substantial costs and, considering the absence of a clear benefit to shareholders, would be more likely to negatively impact shareholder value in the long run than to enhance it<sup>2</sup>.
- Financial markets provide opportunities to add value through strategic financial transactions. However, such transactions should not be confused with hedging activities, the purpose of which is to protect Cashflow at Risk.

<sup>1</sup> Cashflow-at-Risk or 'CFaR' – "worst expected loss relative to projected business plan cashflows over a one year horizon under normal market conditions at a confidence level of 95%". 'Cashflow' is measured as Earnings after Interest but Before Taxes, Depreciation and Amortisation.

<sup>2</sup> Gold is an exception where the structure of this market provides an incentive to sell forward.

These conclusions support the new strategy for market risk management described below:

### ***Market Risk Management Objective***

**To support the delivery of BHP's financial targets, while protecting the company's future financial security and flexibility.**

### ***Market Risk Management Strategy***

**To manage risk at the portfolio level through the natural diversification in the BHP Portfolio.**

**To only hedge when the residual risk in the portfolio may compromise the delivery of corporate objectives.**

**To enter into strategic financial transactions, to limited extent, when a market within the portfolio deviates significantly from long run expectations.**

**To communicate BHP's policy and resultant risk profile to stakeholders in a clear, precise and responsive manner.**

#### **Where:**

- Managing risk at the portfolio level means managing risk net of BHP's natural diversification benefits, rather than hedging individual price risks on a transaction or individual asset basis.
- Hedging is deemed necessary only in circumstances where the risk level from underlying exposures (modelled as CFaR) is believed to pose an unacceptable threat to key aspects of corporate strategy. As a minimum, the need to hedge will be judged in the context of avoiding a material exposure to unacceptable financial risk, taking into account all the Company's risk (country risk, operational risk etc). Based on the current composition of BHP's portfolio, there is no requirement to hedge for the foreseeable future<sup>1</sup>.
- Strategic financial transactions to capture value from perceived market under/over valuations will be taken within defined limits, but treated separately from hedging transactions. Such transactions will be subject to stop-loss limits and will be reported at the Group level. They will be managed, monitored, reported and accounted for in a manner consistent with the policies employed by a financial institution.

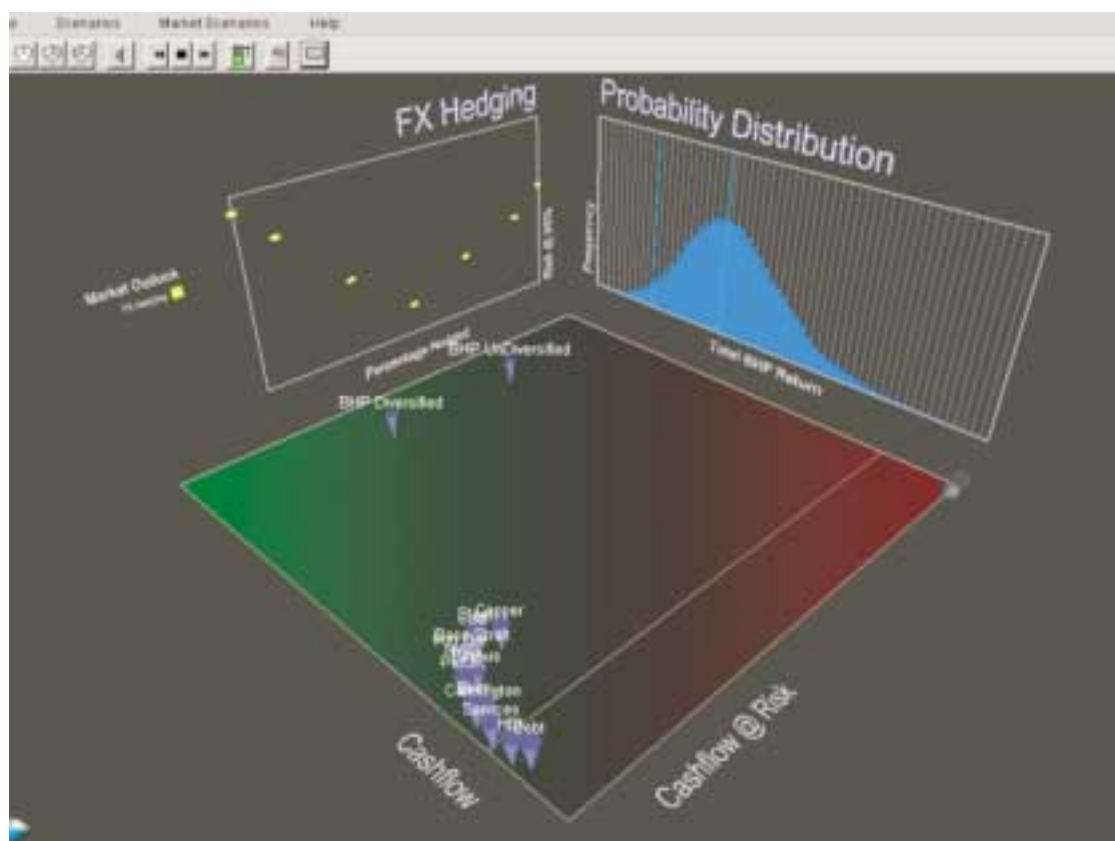
<sup>1</sup> There will be a few exceptions approved on the basis of bona fide commercial justification or the requirements of key stakeholders such as minority partners or project financing providers.

## BHP's Current Risk Profile

In order to investigate details of BHP's exposure to market risk, a three-year 'Cashflow at Risk' (CFaR)<sup>1</sup> model has been developed using innovative 3D visualization technology. Panel 1 is a snapshot from the model. Within the 3D visualization framework it is possible to view and 'drill down' into many aspects of the portfolio. It is a valuable decision making tool which enables management to achieve a true portfolio perspective.

The CFaR technique is an adaptation of the Value at Risk (VaR) technique typically found in financial institutions. The key point to emerge from the model is that natural diversification in BHP's portfolio effectively halves the CFaR compared to a hypothetical 'undiversified' company with the same revenues and subject to similar market volatility. This is illustrated by the 'BHP Diversified' and the 'BHP Undiversified' points in the *Cashflow at Risk versus Cashflow* diagram in Panel 1. Note that the points representing the individual Business Units are bunched together in the bottom left hand corner of the diagram and are indistinguishable. "Managing at the portfolio level" means managing BHP's diversified portfolio risk versus reward, not the market risks of the individual business units.

Based on BHP's current business plan, the Company would have a CFaR of A\$3.1 billion<sup>2</sup> without any diversification benefits, while the effects of diversification reduce that number to A\$1.6 billion. The current hedge portfolio further reduces this to A\$1.4 billion. The ratio of *Cashflow @ Risk* to *Cashflow* is approximately 23 per cent.



**Panel 1: MEASURING PORTFOLIO DIVERSIFICATION - CASHFLOW AT RISK MODEL<sup>3</sup>**

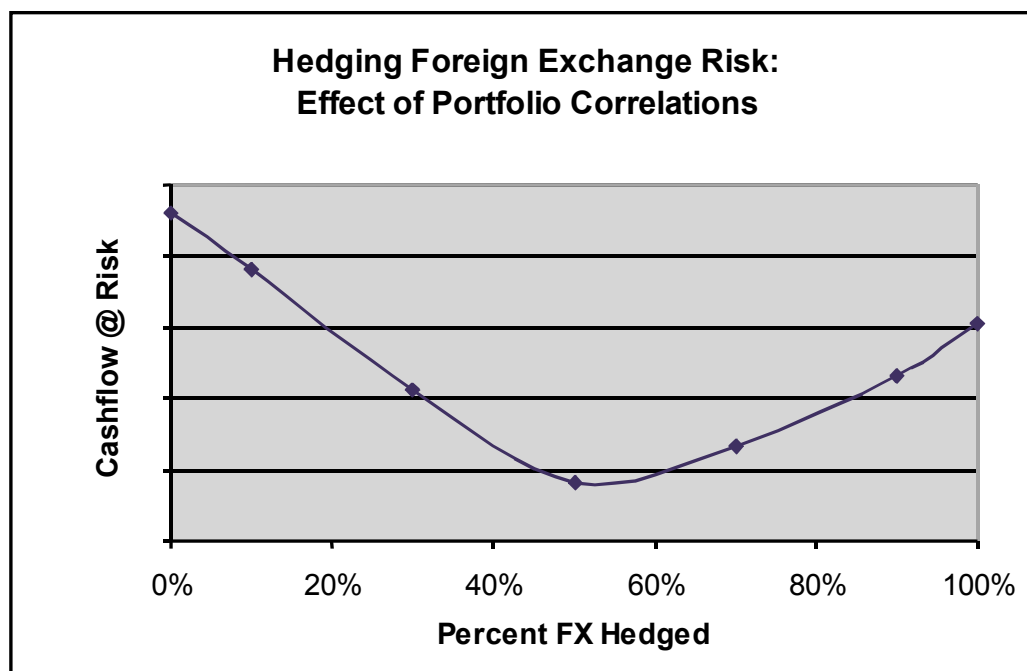
<sup>1</sup> Cashflow-at-Risk or 'CFaR' – "worst expected loss relative to projected business plan cashflows over a one year horizon under normal market conditions at a confidence level of 95%". 'Cashflow' is measured as Earnings after Interest but Before Taxes, Depreciation and Amortisation.

<sup>2</sup> BHP has modeled market risk in many ways. The numbers in this paper are based on forecast production volumes, forward curves (where available), and historical volatilities and correlations. There is significant agreement between the model results and BHP's past performance. The model results are included in accordance with the communications element of the new strategy, and are specifically to show the diversification that exists within the portfolio. The intention is that CFaR information, such as has been included in this paper, will be disclosed to stakeholders on a regular basis.

<sup>3</sup> The panel is a screen shot from BHP's Cashflow at Risk model. This can be viewed during Australian briefings in December or through Investor Relations by request.

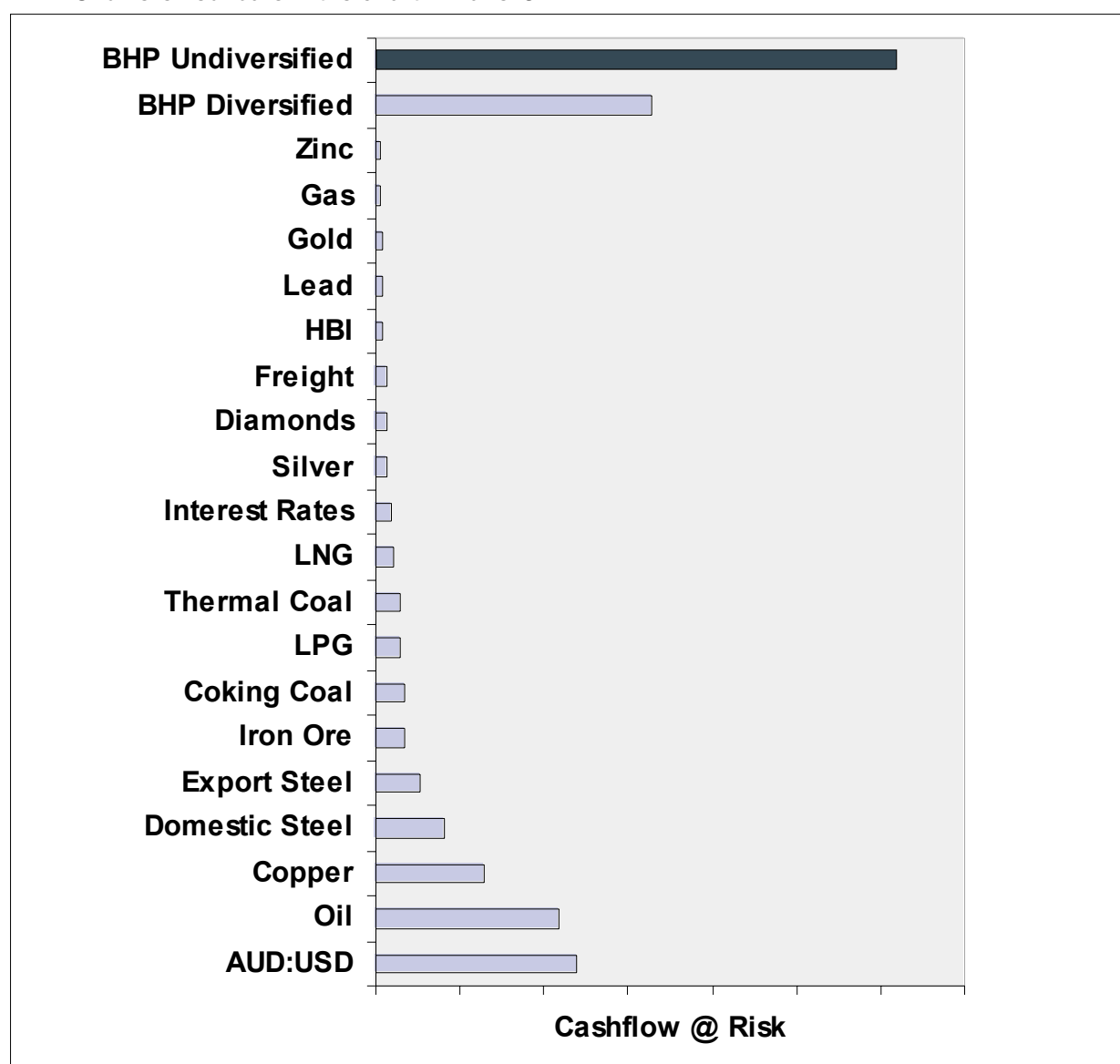
The model demonstrates the interplay between different risks and how uncoordinated single hedges can increase the overall risk of the portfolio. This is illustrated in Panel 2 which shows the simulated effects of increasing levels of foreign exchange cover added to BHP's portfolio. The impact is to reduce risk up to a certain point after which the hedging activity begins to increase risk.

Furthermore, the model allows the Company to evaluate the 'at risk' component of its cashflow associated with major capital deployment to existing or new commodity businesses, or resulting from significant acquisitions or divestments.



*Panel 2: HEDGING RISKS IN ISOLATION CAN INCREASE RISK*

The model also shows the individual risk components of BHP's current portfolio. It demonstrates that, in CFaR terms, BHP's main exposures are to the AUD:USD exchange rate, oil prices and copper prices. The extent to which these risks diversify is reflected in the difference between the 'BHP Diversified' and 'BHP Undiversified' bars in the chart in Panel 3.



Panel 3: BHP's MARKET RISKS

Apart from providing key insights into BHP's actual risk, the model provides a framework for assessing the impact of market risk and management responses, taking into account all capital allocation decisions, not just hedging and strategic financial transactions.

The construction of the CFaR model provides BHP with a powerful tool to assess the extent of its exposure to market risk. This tool is a means by which BHP will measure and monitor its market risk going forward. This is particularly important given the move to a 'self insurance' model.

## Communication of Portfolio Risk Management Strategy

BHP will communicate the execution of its new policy by a number of means, including:

- The Market Risk Management Policy will be detailed in the Annual Report – including sections on policy and governance.
- There will be quarterly disclosure of exposures and related hedge transactions.
- There will be annual disclosure of Cashflow at Risk.
- Profit and loss on strategic financial positions will be reported in quarterly profit announcements.
- Value at Risk (VAR<sup>1</sup>) on any strategic financial positions will be disclosed.

## Governance Framework

Given the implications of this strategy, governance is an important feature of implementation. The key features of the Governance Framework are outlined below:

- Policy is approved by the Board.
- The Policy Committee is responsible for implementation of BHP's Market Risk Management Policy.
- There will be regular reporting to the Board including status information (eg, portfolio composition, hedge position, mark-to-market, CFaR, VAR), compliance information and performance information.
- Policy will be disclosed at least annually in BHP's annual financial statements, and more often if material changes are made to policy.

## CONCLUSION

BHP has adopted a new market risk management strategy that forms an integral component of the implementation of BHP's portfolio model.

The new strategy is based on extensive quantitative analysis of the risks and opportunities in the BHP portfolio and applies leading financial markets thinking to a portfolio of natural resource assets, as part of the goal of growing shareholder value. It enables BHP to more rigorously manage the risks in its portfolio and contributes to ensuring that risks to corporate strategy from capital allocation decisions and major changes in commodity markets can be effectively assessed.

<sup>1</sup> Value-at-Risk or 'VAR' – "worst expected loss in the mark-to-market value of the strategic transactions portfolio over a five day horizon under normal market conditions at a confidence level of 95%"

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