



Hedging Foreign Exchange

5 November 2008

Introduction

The Electricity Commission is currently considering the role of hedging in Grid Upgrade Plans and the treatment of associated costs.

This note responds to three questions posed by the Commission to Castalia:

- **Question 1.** Is it prudent for the Commission to encourage Transpower to hedge foreign exchange exposure [and to allow the recovery of hedging costs from consumers]?
- **Question 2.** In the absence of such encouragement from the Commission, is hedging prudent for Transpower?
- **Question 3.** Should the Commission accept Transpower's using a forward exchange rate to estimate future costs when seeking approval for an investment proposal?
- **Question 4.** How have other regulators handled the issue of foreign exchange hedging?

Note that these questions relate to different phases of project approval and cost recovery. Question number one relates to the recovery of actual costs of an approved project. Question three relates to the approval process enshrined in the Grid Investment Test.

Our Answers to Questions 1 and 2: Hedging

In our view, no hedging is warranted. Our reasoning is as follows.

Transpower will bear very little foreign exchange risk.

The Electricity Commission proposes that consumers will bear foreign exchange risks because these risks are outside Transpower's control. In other words, foreign exchange cost variations in approved projects will be passed through to consumers. We agree with this approach.

No risk implies no hedging

In this setting, the answers to the hedging questions—in respect of foreign exchange risks—appear straight forward:

- We don't think it would be prudent for the Commission to ask Transpower to hedge these risks on behalf of—and at the expense of—consumers. The main

reason is that the effect on consumers of the uncertainty in the final electricity price is too small. The other reason is that foreign exchange risks are likely to be “non-systematic”—that is, uncorrelated with the New Zealand market as a whole—and thus likely to be diversified away by consumers

- Assuming that the Commission does not ask Transpower to hedge, hedging is then entirely Transpower’s “private” concern and the cost of hedging should not come through into tariffs. The decision over hedging will be between Transpower’s management, Board and shareholders.

A comment about pass-through of foreign exchange cost variations

In saying that variations in foreign exchange costs will be “passed through”, we recognise that there is potentially a difficulty in separating exchange rate effects from changes in what is actually purchased and changes in the foreign currency cost of the equipment involved. Pass-through provisions could also distort decisions made during the implementation of the project if some cost variations can be passed through and others not.

We believe these difficulties can be substantially avoided if the pass-through provision is specified as follows:

- Assemble a list of the offshore expenditures in the Grid Upgrade Plan grouped by foreign currency and quantified at current prices in those foreign currencies
- Through the life of the project, index those foreign currency amounts by a suitable inflation index in the corresponding country
- Allow Transpower to recover the New Zealand dollar equivalents of those indexed foreign currency amounts at the actual exchange rates that apply when the purchases are made.¹

This approach would provide Transpower with a hedge in respect of a fixed quantity of purchases. There will be no ambiguity over whether the pass-through relates to exchange rates, changes in scope or foreign inflation. The approach would also avoid distortions to decisions about changes in purchases.

Question 3: the use of Forward Rates

In our view the Commission should allow Transpower to use forward exchange rates in undertaking the grid investment test: the approach could provide a valuable cross check on the existing method where exchange rate risks are significant relative to equipment price risks in the source country.

How would forward rates be used?

Forward exchange rates can be used to provide market estimates of the risk-adjusted **present values** of the uncertain future costs that will be incurred in foreign currencies.

The switch from the usual approach is as follows:

- Instead of multiplying together an uncertain future exchange rate and an uncertain future foreign currency cost and calculating the New Zealand dollar present value using a risk-adjusted discount rate, this approach would

¹ In other words, New Zealand dollar cost increases from this source would not count towards “using up” the contingency allowance in Transpower’s project cost.

- Multiply together “certainty equivalents” for the future exchange rate and the future foreign currency cost and calculate the New Zealand dollar present value by discounting at the risk free rate.

The certainty equivalent for the future exchange rate is the forward exchange rate, observable in foreign exchange markets. Currency traders will specify now what exchange rate they will apply at the time of the future purchase.²

The method also requires a certainty equivalent for the future foreign currency cost. It is unlikely that there is a forward market in all the relevant equipment. The best available estimate of the certainty equivalent at the time of the planned purchase may be the current foreign currency cost increased by the inflation rate expected in that source country. In some cases, Transpower may have quotes in the foreign currency for future delivery that are essentially forward prices.

The product of these two certainty equivalents is the certainty equivalent of the future nominal New Zealand dollar cost of the equipment involved. Discounting this certainty equivalent future cost by the nominal risk free rate in New Zealand gives the present value that is required in the Grid Investment Test.

The use of certainty equivalents

In the grid investment test, a present value of uncertain future costs—discounted at a risk-adjusted discount rate—is a certainty equivalent; it is the certain amount one would have to pay now to have another party agree to incur the uncertain future costs. As a result, it is not surprising that this certainty equivalent can be valued in terms of future certainty equivalents (the forward contract in the case of the currency) and the risk free discount rate.³

Benefits of the approach

Using the forward exchange rate may be a valuable cross check on the method currently used by Transpower.

The current method effectively assumes that future exchange rates maintain purchasing power parity and calculates the present values of these uncertain costs using the standard seven percent discount rate of the Grid Investment Test. The purchasing power parity assumption is not well born out empirically and the risk adjustment implicit in the seven percent discount rate is quite unrelated to foreign exchange risks.

Using discounted forward rates gives **market** valuations of the uncertain foreign exchange costs. On the other hand, the expected foreign currency cost may over-state the certainty equivalent value of this component and therefore over-estimate the present value when combined with the risk free rate.

² Forward exchange rates differ from spot exchange rates in both the timing and the risk of the currency exchange transaction. Using these rates, we can fix two currency exchanges: one today (using the spot rate), and one at a future date (using the forward rate). By fixing these rates, we are removing risk from each exchange transaction: in this sense, both rates are risk-adjusted. But we cannot use today’s spot rate to fix the rate for exchange in the future and remove this risk, because to put it simply, the spot rate is the market’s offer for exchanging currency on a different day.

³ Another way of putting this is saying that a present value calculation adjusts for two factors: the timing of the future amount (a dollar today is worth more than a dollar tomorrow), and the uncertainty of the future amount (a riskless dollar is worth more than a risky dollar, assuming risk aversion). The forward exchange rate adjusts for the second factor—turning the uncertain future spot exchange rate into a certain forward exchange rate. While the risk free rate—that remains in the PV calc—adjusts for the first of the factors.

Question 4: Regulatory Treatment Elsewhere

In our preliminary survey, we have been unable to find any useful discussion of hedging and hedging costs in other jurisdictions. We have studied published regulatory decisions in the gas and electricity sectors in the United Kingdom, Australia, the United States and India. We found little explicit mention of hedging costs.

In India in 2006, the Power Grid Corporation—the equivalent of Transpower—was refused permission to recover the costs of hedging exchange rate risks on foreign currency loans. Similarly, in 2007 the Australian Energy Regulator (AER) declined Powerlink’s request to recover the cost of hedging interest rate risks.

However in both cases, the regulated agencies were also not allowed to recover variations in the underlying variables themselves (interest rates or foreign exchange) so the settings are not directly comparable with Transpower’s.