



## ARTC

Adjusting for Expected Inflation: Submission to IPART

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In conducting the analysis in the report Synergies has used information available at the date of publication, noting that the intention of this work is to provide material relevant to the development of policy rather than definitive guidance as to the appropriate level of pricing to be specified for particular circumstance.

## Executive Summary

Australian Rail Track Corporation (ARTC) has requested Synergies Economic Consulting (Synergies) to provide an opinion regarding the use of inflation-indexed swaps to estimate inflation. Historically, consistent with other regulators, IPART has applied the Fisher equation to observed yields for nominal Commonwealth Government bonds and Commonwealth Government indexed bonds. There are two problems with this approach:

- the bias in yields on indexed bonds. The bias is due to both the demand for the indexed bonds being greater than the supply and also the illiquidity in the market for the bonds. IPART has been adjusting the yield by 20 basis points to counter the bias; and
- the fact that the Australian Office of Financial Management has signalled that there will be no further issues of indexed bonds (which present a more significant problem in practice).

As a consequence of these problems, IPART is investigating alternative approaches to estimate inflation. Inflation estimates can be obtained from market data or from economists' forecasts. In principle, market data is preferred as long as the resulting estimate is robust and reliable. If the reliability of the estimate is in question, then the preferred method is economists' forecasts.

Synergies believes that the reliability of inflation estimates using inflation-indexed swaps is in question due to:

- the inconsistencies in the results of IPART's tests;
- the trading life of the derivatives is unknown;
- that the 30 year estimate does not approximate the mid-point of the RBA target;
- there appears to be too much volatility in long term estimates;
- as the swap market is a dealer market where the banks provide a quote, the bank's quotes would be based upon the bank's economists view of expected inflation and hence economists' forecasts are linked to bank quotes; and
- the need to test further bank forecasts for inflation against bank market-making quotes, given the illiquidity in the market.

The recommended approach to estimating inflation is to use RBA forecasts.

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# 1 Introduction

Until relatively recently most Australian regulators have based the estimate for long-term inflation on the forecast implied by the difference between (ten year) nominal and indexed Commonwealth Government bond yields, using the Fisher equation<sup>1</sup>. While there has always been liquidity issues in the Australian indexed bond market (based on its relative size), the Government's decision to cease the issuance of indexed bonds in 2003 had a significant impact on the depth and liquidity in this market.

It is now generally recognised that a bias exists in indexed bond yields, with the significant reduction in supply relative to demand putting upward pressure on prices (and hence downward pressure on yields). This problem was acknowledged by the Commonwealth Government in a letter to the ACCC in 2007:

The Australian Government's suspension of issuance of these inflation-linked bonds, as well as increased demand for this asset class, is likely to cause market-implied inflation estimates to exceed consensus forecasts of inflation over the medium term.<sup>2</sup>

In its recent June 2008 decision in relation to Sydney Water,<sup>3</sup> IPART recognised the current bias in indexed bond yields and the departure from the Fisher approach by at least three Australian regulators. Notwithstanding IPART's recognition of the bias, it has continued to use an estimate implied by the difference between nominal and risk-free rates, instead of an alternative forecast. It adjusted for the bias by adding a 20 basis point margin to the indexed bond yield, which in its view is sufficient compensation for their relative scarcity. One of reasons it puts forward for retaining this approach is that the use of market-based data is objective, transparent and avoids the need for assumptions regarding future inflation.

The suspension of the issuance of indexed bonds and the need to adjust for the bias has led IPART to investigate alternative financial market instruments to estimate long-term inflation. IPART considers that market-based measures are in principle superior to estimates for inflation based on non-market data, such as economists' forecasts of inflation.

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<sup>1</sup> This specifies the following relationship:  $(1 + \text{nominal rate}) = (1 + \text{real rate})(1 + \text{inflation})$

<sup>2</sup> Commonwealth Treasury (2007), The Treasury Bond Yield as a Proxy for the CAPM Risk-free Rate, Letter to the ACCC, 7 August, p.1.

<sup>3</sup> Independent Pricing and Regulatory Tribunal (2008), Review of Prices for Sydney Water Corporation's Water, Sewerage, Stormwater and Other Services From 1 July 2008, Water – Determination and Final Report, June.



## 2 Market Solutions

IPART has a preference for using financial market data subject to the robustness and reliability of the estimates derived from the financial instruments involved. Two financial market solutions have been proposed by IPART being:

- corporate and semi-government indexed bonds; and
- inflation-indexed swaps

### Indexed bonds

As a bias is now recognised in Commonwealth Government indexed bond yields, alternate market data may be corporate or semi-government indexed bonds. The problem with this source of market data is that the number of securities issued is small and the markets are relatively illiquid for both of these types of issues. Noting that liquidity in these markets will tend to always be lower than for Commonwealth Government issues (due to size and credit considerations), it is extremely unlikely that they could serve as a better proxy than Commonwealth Government issues, at least for the near future.

As the market for physical products is contracting, IPART has turned to the derivatives market.

### Inflation-indexed swaps

IPART is considering the use of inflation-indexed swaps and has requested submissions regarding the use of inflation-indexed swaps as an alternative to the current practice. Data is available from Bloomberg for swaps out to 30 years. From the quotes it is possible to derive continuous compounded yearly future inflation rates. The curve is based upon quotes by major financial institutions. The quotes are bids and offers and it does not mean that a swap was actually traded. IPART consider that trades are not necessary as the bank needs to honour the quote made. The bid/offer spread is 10 basis points and using a mid-point in estimating expected inflation will incorporate transaction costs.

In principle, the approach is sound given that derivatives are priced so that arbitrage opportunities cannot exist, on average. However, preliminary investigations have raised a number of concerns.

### **Concerns with inflation-indexed swaps**

There are a number of concerns with inflation-indexed swaps. Firstly, the IPART approach is a relatively new concept and needs to be tested with results from the physical market where there is some liquidity. Unfortunately, liquidity is contracting which means that it is not possible to validly test the results.

Associated with this is the fact that capital markets do value cash flows, and according to the efficient markets hypothesis, this value reflects all publicly available information at that point in time. However, in order for this assumption to hold, it presumes a certain degree of liquidity in the market. A lack of liquidity in the market limits the price discovery process and means that 'current' market prices may not necessarily reflect the current views and expectations of market participants. Similar implications would apply to derivatives.

Secondly, the financial intermediaries that offer the derivative product need to be able to hedge their position. The principle hedging tool is the physical product itself i.e. indexed bonds. The size of the derivatives market must therefore be dependent upon the size of the physical market or hedging would not be possible. As the physical market contracts then, it follows, that the derivatives market will also contract. An alternative to inflation-indexed swaps should be sought as the liquidity in this market is inextricably linked with the physical index bond market.

Additionally, if the market for the derivatives is illiquid it may well be that quoted rates may be distorted by specific demand and supply conditions such as, for example, the global financial crisis. The distorted rates may then reflect these conditions rather than reflecting the market's expectation about inflation itself.

Thirdly, IPART tested the Fisher approach with the swap curve for two rate cuts by the RBA. On both occasions the absolute difference between inflation estimated by the Fisher equation and the swap curve were between 14 and 19 basis points. The problem is that on one occasion the difference was positive and on the other occasion the difference was negative. The inconsistent results are of concern.

Lastly, one would expect that with a 30 year time horizon, the inflation expectation would be relatively stable and close to the mid-point of the RBA target. Using data produced by IPART, expected inflation (30 year) is 3.4% on 3 September 2008 and 3% on 8 October 2008. These results are divergent estimates given the long time horizon and are well above the mid-point for the RBA target.

While expected inflation estimated from market data is preferred to expected inflation estimated from non-market data, this approach is only appropriate where market data will produce a more reliable estimate. Synergies believes that the approach suggested

by IPART will not produce a reliable estimate, at least at the current time. Synergies proposes that RBA forecast should be used as an estimate of inflation.

### 3 RBA Forecast

In its decision in relation to SP AusNet the Australian Energy Regulator (AER) set out its reasons for departing from estimating implied inflation based on the Fisher equation. While it confirmed that a market-based approach is preferable to any other method, at the current time it is "...not aware of a reliable market based alternative that can be mechanistically applied in a similar way to these measures."<sup>4</sup> In the absence of a reliable market-based estimate, a forecast of inflation needs to be used.

Consideration was given to the source and horizon of the forecasts. It was concluded that the RBA's forecasts should be given the most weight. It also acknowledged the difficulties in reliably forecasting inflation over a long horizon, with the RBA's forecasts only going out as far as two years. It therefore determined to estimate a long-term average based on the RBA's forecasts for the first two years (as published in its *Statement of Monetary Policy*), and then assuming 2.5%, being the mid-point of the RBA's target band for inflation, after that. We note that in its letter to the ACCC the Commonwealth Government had recommended basing the forecast on this mid-point:

We therefore recommend that the ACCC uses the mid-point of the RBA's target band for inflation (that is, 2.5 per cent per annum) as the best estimate of inflation. Since the independence of the Reserve Bank Board in conducting monetary policy was formalised in March 1996, annual inflation has averaged 2.5%.<sup>5</sup>

In the absence of a reliable, forward-looking measure for the bias in indexed bond yields and the questions that surround inflation-indexed swaps, we therefore do not see how this market data can still be applied to derive a reasonable estimate for long-term inflation, at least at the current time.

Most of the recent regulatory decisions in relation to inflation have departed from the Fisher approach in recognition of the bias in indexed bond yields. We are therefore of the view that the most appropriate approach at the current time is the one which estimates a long-term average based on the RBA's forecasts for the next two years and the mid-point of the target range for inflation after that.

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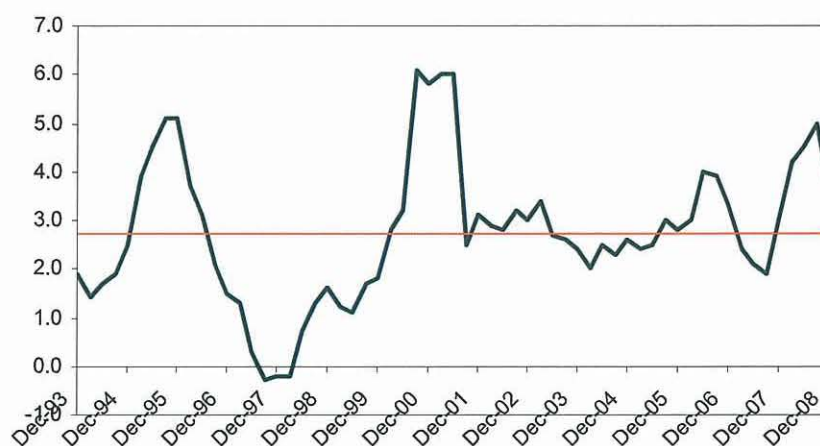
<sup>4</sup> Australian Energy Regulator (2008), Final Decision: SP AusNet Transmission Determination 2008-09 to 2013-14, January, p.102.

<sup>5</sup> Commonwealth Treasury (2007), op.cit.



The RBA adopted a target for consumer price inflation of 2-3% per annum, on average over the cycle, in 1993. The initial formulation referred to 'underlying inflation', but after the changes to the construction of the CPI in 1998 both the Bank and the Treasurer agreed to focus on the headline CPI. This did not entail any change in the practical operation of policy, but was designed to make the inflation objective clearer to the public. Figure 1 depicts actual inflation compared with average inflation since the introduction of the target band. It can be seen that as a long term estimate of inflation, the mid point is a reasonable approximation.

**Figure 1 Inflation**



Data source: RBA

## 4 Conclusion

Synergies recommends that expected inflation should be estimated based on RBA forecasts. This is done by taking a long-term (10 year) average, based on their most recent forecasts for inflation for the first two years and then the mid-point of their target range beyond this.

The basis for the recommendation is:

- the inconsistencies in IPART's tests;<sup>6</sup>
- the trading life of the derivatives is unknown;

<sup>6</sup> The fact that the absolute difference was approximately 20 basis points but this difference was positive in one instance and negative in another.

- that the 30 year estimate does not approximate the mid-point of the RBA target;
- there appears to be too much volatility in long term estimates;
- as the swap market is a dealer market where the banks provide a quote, the bank's quotes would be based upon the bank's economists view of expected inflation and hence economists' forecasts are linked to bank quotes; and
- the need to test further bank forecasts for inflation against bank market-making quotes, given the illiquidity in the market.

It is also noted that the ACCC (and other Australian regulators) currently uses non-market forecasts (based on RBA data).