

Impact of interest rates on product prices

To examine the impacts of interest rates on product prices, we combined information from the ABS Input Output Table (ABS Cat No 5209.0.55.001, Table 5), the various producer price indices (ABS Cat no 6427.0) and RBA data on lending rates (RBA Tables F2 and F3, which cover indicator lending and bond rates respectively). We look first at the question of whether different interest rates are correlated with the different producer price indices, examining the quarterly correlation from the March quarter of 1998 to the June quarter of 2014. The results are shown in Table 1. Note that the averages and quartiles are across the correlation between the relevant interest rate and the price index of each of the 233 different sectors for which price indices are made available by the ABS. We examine two sets of correlations; contemporaneous (interest rate in period t with price index in period t) and lagged (where the interest rate is lagged by one quarter).

Table 1: Correlation between interest rates and output prices

| | Contemporaneous | | | | one period Lag | | | |
|---|-----------------|--------------|--------|--------------|----------------|--------------|--------|--------------|
| | Average | 1st quartile | median | 3rd quartile | Average | 1st quartile | median | 3rd quartile |
| Lending rates; Small business; Variable; | -0.205 | -0.361 | -0.263 | -0.096 | -0.214 | -0.354 | -0.267 | -0.114 |
| Lending rates; Large business; Variable | -0.426 | -0.623 | -0.540 | -0.371 | -0.437 | -0.622 | -0.536 | -0.380 |
| Lending rates; Large business; Bills | -0.119 | -0.240 | -0.154 | -0.028 | -0.144 | -0.253 | -0.180 | -0.066 |
| Non-financial corporate A- bonds, Yield – 3 yr | -0.349 | -0.659 | -0.495 | -0.186 | -0.366 | -0.656 | -0.516 | -0.225 |
| Non-financial corporate A- bonds, Yield – 5 yr | -0.254 | -0.554 | -0.376 | -0.066 | -0.271 | -0.547 | -0.398 | -0.094 |
| Non-financial corporate A- bonds, Yield – 7 yr | -0.177 | -0.458 | -0.267 | 0.043 | -0.193 | -0.466 | -0.304 | -0.016 |
| Non-financial corporate A- bonds, Yield – 10 yr | -0.094 | -0.352 | -0.168 | 0.127 | -0.110 | -0.360 | -0.194 | 0.105 |
| Non-financial corporate BBB-bonds, Yld – 3 yr | -0.143 | -0.414 | -0.246 | 0.074 | -0.161 | -0.426 | -0.280 | 0.036 |
| Non-financial corporate BBB- bonds, Yld – 5 yr | -0.022 | -0.245 | -0.080 | 0.157 | -0.038 | -0.265 | -0.123 | 0.176 |
| Non-financial corporate BBB- bonds, Yld – 7 yr | 0.047 | -0.158 | 0.016 | 0.235 | 0.034 | -0.173 | -0.026 | 0.241 |
| Non-fin corporate BBB-bonds, Yld – 10 yr | 0.154 | -0.016 | 0.108 | 0.320 | 0.139 | -0.037 | 0.098 | 0.296 |

Source: DBP analysis

Most of the evidence appears to point to negative correlation; an interest-rate increase leads to a price decrease, which would be the polar opposite of what the ERA expects with efficient industries. However, simple correlation masks the fact that there are many factors of production, not just interest rates, and a change in output price can be associated with the net effect of several different input price changes, including interest rates.

To examine this in more detail, we look to the ABS input-output tables, which have 114 different industries. Using the tables, we track the top ten inputs to each industry, and then, using the description of industry sectors given in the Input-Output tables and the price indices, we match the two data sets. Not all Input-Output table elements can be matched in this way, as the descriptions are not sufficiently precise.

This gives us ten input price indices and an interest rate for each output price index. We remove from the set of explanatory variables own price index (many industry sectors in the input-output table have their own sector as the main input) and the sectors for which we are not able to map a product price index. We then choose five different interest rates from Table 1 above; the three bank rates (first three rows) and five and ten-year BBB bonds. The net result is 480 separate regressions seeking to test the degree to which an interest rate drives output prices once the prices of other key inputs to an industry sector are considered. We test for heteroscedasticity and serial correlation in results, correcting for it where it occurs. Of the 480 regressions, 194 models are significant (have an F-statistic greater than 2) for the contemporaneous case and 195 are significant in the lagged inputs case. The result, in terms of the significance of the different interest rates is shown in Table 2.

Table 2: Interest rates as a significant input cost

| | contemporaneous | | | Lagged | | |
|--|-----------------|----------------|--------------------------------------|---------------|----------------|--------------------------------------|
| | <i>Number</i> | <i>percent</i> | <i>percent of significant models</i> | <i>Number</i> | <i>percent</i> | <i>percent of significant models</i> |
| Total significant results | 46 | 9.58% | 23.71% | 47 | 9.79% | 24.10% |
| Total bond significant results | 15 | 5.21% | 20.55% | 15 | 5.21% | 20.55% |
| Total bank debt significant results | 31 | 16.15% | 25.62% | 32 | 16.67% | 26.23% |
| Industries for which all results significant | 1 | 1.04% | 2.58% | 2 | 2.08% | 5.13% |
| Industries for which all bank debt results significant | 4 | 4.17% | 9.92% | 6 | 6.25% | 14.75% |
| Industries for which all bond results significant | 4 | 4.17% | 10.96% | 5 | 5.21% | 13.70% |

Source: DBP analysis

If interest rates were a strong driver of product prices, it should not matter whether bond or bank debt is chosen; all five interest rate measures should show the same results. However, in only one or two cases (out of 194 or 195 for the contemporaneous and lagged models respectively) did we see all five measures of interest costs being significant for a given industry. Indeed, only in a handful of cases were all three measures of bank debt or both measures of bond debt significant in a given industry at the same time. Although bank debt is roughly twice as likely to be significant as bond debt (at around one-quarter of all significant models), in general, the different measures of bank debt are not in agreement for a given industry.

Taken overall, there would appear to be very little evidence that interest rates drive output prices across the various sectors of the Australian economy. This is an important consideration for regulators seeking to replicate the pressures of a competitive marketplace in regulatory pricing; as shifts in interest rates do not appear to be one of these pressures.