When Do U.S. Monetary Policy Surprises Matter for Australian Borrowing Costs? Evidence of a Post-2020 Regime Shift

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Abstract

Does an unanticipated change in U.S. monetary policy raise the yield on Australian Government Securities, and with it the cost of Australian government borrowing? We show that the answer depends critically on when one asks it. Using the high-frequency shock series of Jarociński and Karadi (2020) and Local Projections across the 2-, 5-, and 10-year AGS maturities over 2013–2024, we find the effect is statistically indistinguishable from zero before 2020, and becomes large and reliable only from the COVID period onward — a shift confirmed by a formal structural break test. A surprise comparable to the largest observed in our sample is associated with an increase of approximately eighteen to twenty basis points in Australian yields at impact, operating substantially through co-movement in the U.S. 10-year Treasury yield. These findings indicate that Australian government borrowing costs have grown considerably more exposed to U.S. monetary policy surprises specifically in the post-2020 environment.

JEL : E43, E52, F42, G12

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1. Introduction.

Monetary policy conducted in Washington does not remain in Washington. It is by now well established that shifts in U.S. monetary policy propagate through global financial markets, altering asset prices and borrowing conditions in economies whose central

banks have no formal say in the decision (Rey, 2013; Miranda-Agrippino and Rey, 2020). For a small, financially open economy such as Australia, whose sovereign debt is priced in markets deeply integrated with global capital flows, this raises a question of direct practical consequence: to what extent does the cost of Australian government borrowing depend not on decisions taken by the Reserve Bank of Australia, but on surprises originating at meetings of the Federal Open Market Committee?

We take up this question directly, asking whether unanticipated changes in U.S. monetary policy — the component of a Federal Reserve decision that financial markets did not already anticipate — produce a measurable and statistically reliable change in the yield on Australian Government Securities (AGS), and by extension in the cost of servicing Commonwealth debt. The stakes extend well past a narrow empirical curiosity: debt servicing costs are a first-order fiscal concern for any sovereign issuer, and if a material share of their variation originates offshore, this bears directly on the practical limits of domestic monetary and fiscal autonomy, echoing a long-standing concern in the international finance literature regarding the erosion of monetary independence under open capital accounts (Rey, 2013; Obstfeld, 2015).

Empirically identifying the causal effect of monetary policy on asset prices is complicated by the fact that policy actions are rarely independent of the economic conditions that motivate them; a central bank that raises rates in response to strong growth confounds any attempt to attribute subsequent asset price movements to the policy action itself rather than to the underlying state of the economy it was responding to. The literature has addressed this endogeneity problem by exploiting high-frequency identification: measuring the change in market-based interest rate expectations within a narrow window surrounding a policy announcement, on the premise that little else of macroeconomic relevance occurs within such a short interval (Kuttner, 2001; Bernanke and Kuttner, 2005; Gürkaynak, Sack and Swanson, 2005). This approach has since been extended to estimate dynamic causal effects using the shock as an external instrument within a Local Projections framework (Gertler and Karadi, 2015; Ramey, 2016), and to demonstrate that a substantial share of what earlier studies attributed to

monetary policy surprises instead reflects information the central bank reveals about its own economic outlook (Nakamura and Steinsson, 2018). Building on this tradition, Jarociński and Karadi (2020) demonstrate that a single announcement-window surprise conflates two economically distinct signals — a genuine policy surprise, and information the Federal Reserve inadvertently reveals about its own assessment of the economic outlook — and that failing to separate the two can reverse the sign of the estimated effect on asset prices. We adopt their decomposed shock series as the identifying instrument in this paper, treating it as a plausibly exogenous measure of U.S. monetary policy surprises with respect to conditions in the Australian bond market. Where the effective policy rate itself is confounded by the zero lower bound, we supplement it with the shadow rate measure of Wu and Xia (2016), which extends comparability of the policy stance across periods of unconventional monetary policy.

The transmission of such shocks beyond U.S. borders has itself received close attention. Kearns, Schrimpf and Xia (2023) document that interest rate spillovers from major central banks to a broad panel of advanced and emerging economies operate primarily through financial channels rather than trade linkages, with financial openness the strongest predictor of a country's exposure — a finding of direct relevance to Australia, an economy with few formal capital controls and deep integration into global bond markets. Ehrmann and Fratzscher (2009) similarly find that U.S. monetary policy surprises transmit to foreign asset prices in a manner that varies systematically with the degree of financial integration. This paper narrows that broader literature to a single country pair and a single, precisely defined transmission pathway, rather than attempting to model the full set of channels through which global financial conditions might bear on Australia.

Our empirical strategy accordingly remains deliberately narrow. We trace one specific pathway — a U.S. monetary policy shock, its effect on the Australian government yield curve, and the implied effect on Australian government borrowing costs — using Local Projections (Jordà, 2005) to estimate the dynamic response of AGS yields at the 2-, 5- and 10-year maturities to the Jarociński-Karadi shock, over a monthly sample spanning

2013 to 2024. Where a plausible secondary mechanism exists — for instance, that part of the shock's effect on Australian yields is mediated by its effect on U.S. Treasury yields, consistent with a global portfolio-rebalancing channel of the kind emphasised in Miranda-Agrippino and Rey (2020), or that non-resident holdings of AGS adjust around large policy surprises — we treat these as descriptive, supporting evidence rather than as independent research questions, in order to preserve the focus of the paper on its central causal claim.

We find that a Jarociński-Karadi shock has an immediate, statistically significant, and economically material effect on AGS yields across all three maturities examined, with the response concentrated at impact and dissipating within a month, consistent with rapid incorporation of the surprise into asset prices. This average effect, however, conceals substantial instability over the sample: it is statistically indistinguishable from zero prior to 2020, and becomes markedly stronger and more consistent thereafter, with a formal structural break test pinning the shift to the onset of the COVID period in early 2020 rather than to the start of the Federal Reserve's 2022–2023 tightening cycle specifically. We further show that a sizeable share of the estimated effect, rising from roughly half at the two-year maturity to nearly four-fifths at the ten-year maturity, is consistent with transmission via co-movement in the U.S. ten-year Treasury yield, suggesting that longer-dated Australian yields are disproportionately exposed to the global benchmark-yield channel rather than to the direct policy-expectations channel that dominates at the short end. A secondary analysis of non-resident holdings of AGS moves in a direction consistent with a portfolio-rebalancing story but does not reach conventional statistical significance at the quarterly frequency available to us, and we report this result with the caution it warrants rather than overstating its evidentiary weight.

The remainder of the paper is organised as follows. Section 2 situates the paper within the relevant literature. Section 3 describes the data and their sources. Section 4 sets out the empirical methodology. Section 5 presents the main results. Section 6 reports a

battery of robustness checks. Section 7 discusses the findings and their implications for Australian debt management and monetary policy transmission. Section 8 concludes.

2. Literature Review

This paper draws on, and contributes to, four strands of literature: the identification of monetary policy shocks using high-frequency financial market data; the transmission of U.S. monetary policy to foreign asset prices; the role of foreign investor demand in sovereign bond markets; and the small but growing body of Australia-specific empirical work on monetary policy transmission and yield determination.

The identification of monetary policy's causal effects has long been complicated by the reverse-causality problem inherent in a central bank that sets policy partly in response to the economic conditions researchers wish to hold fixed. Kuttner (2001) proposed resolving this by measuring the surprise component of a policy decision directly from the change in Fed funds futures prices within a tight window around the announcement, a method extended by Gürkaynak, Sack and Swanson (2005) to incorporate the broader path of expected policy alongside the immediate target-rate surprise. Bernanke and Kuttner (2005) applied a related approach to show that the size of an asset-price reaction depends heavily on how anticipated the policy action was, rather than on its raw magnitude. Gertler and Karadi (2015) demonstrated that such surprises could be used as external instruments within a structural vector autoregression or Local Projections framework, allowing researchers to trace the dynamic causal effect of a shock over time rather than restricting attention to its immediate impact. A parallel line of work, most notably Nakamura and Steinsson (2018), showed that a meaningful share of the estimated effect of monetary policy surprises on asset prices in fact reflects an information effect: markets updating their beliefs about the central bank's private assessment of the economy, rather than about policy itself. Jarociński and Karadi (2020) formalised this distinction by jointly decomposing high-frequency surprises in

interest rates and equity prices into a pure monetary policy shock and a central bank information shock, showing that failing to make this separation can materially bias, and in some cases reverse the sign of, estimated policy effects. This paper adopts their decomposed shock series, and confirms in its robustness analysis that the pure policy component, rather than the information component, is what drives the estimated response of Australian yields — a result consistent with Jarociński and Karadi's original finding that the two components can behave very differently.

A second strand of literature asks whether, and through what channels, U.S. monetary policy shocks affect asset prices and financial conditions outside the United States. Rey (2013) argues that a "global financial cycle," driven substantially by U.S. monetary policy and risk sentiment, constrains the monetary autonomy of other economies regardless of their exchange rate regime, challenging the traditional Mundellian trilemma. Miranda-Agrippino and Rey (2020) provide empirical support for this view, showing that a global factor closely linked to U.S. monetary policy explains a large share of the common variation in risky asset prices worldwide. Bruno and Shin (2015) offer a complementary mechanism, modelling how the leverage cycle of global banks propagates financial conditions across borders through cross-border banking flows, providing a further channel through which U.S. monetary conditions can transmit into foreign asset markets independently of direct policy-expectations effects. Obstfeld (2015) offers a more cautious assessment, arguing that while financial globalisation narrows the room for independent monetary policy, the degree of constraint varies with a country's specific financial and institutional characteristics. Ehrmann and Fratzscher (2009) find that the transmission of U.S. monetary policy surprises to other advanced-economy asset prices is systematically stronger for countries with deeper financial integration with the United States, a finding directly relevant to Australia given its open capital account and deep bond market linkages with global capital. Kearns, Schrimpf and Xia (2023) provide the most direct precedent for this paper's approach, applying high-frequency identified shocks from multiple advanced-economy central banks to a panel of 47 economies and finding that interest rate spillovers are large, operate primarily through financial rather than trade channels, and are strongest where

financial openness is greatest; notably, this study includes an earlier working paper version released through the Reserve Bank of Australia's own research discussion paper series (Kearns, Schrimpf and Xia, 2019), reflecting the direct relevance of this question to Australian policymakers. Where this literature typically examines panels of many countries, this paper narrows the lens to a single, carefully identified country pair, allowing for a more detailed examination of the response across the yield curve and of the specific transmission mechanism at work.

A third, related literature examines the role of foreign investors in sovereign bond markets and its implications for government borrowing costs. Arslanalp and Tsuda (2014) develop a methodology for constructing internationally comparable estimates of sovereign debt holdings by investor type across a panel of advanced economies, providing the empirical foundation on which subsequent work has examined the relationship between foreign investor reliance and both the cost and volatility of government borrowing. This literature motivates our treatment of non-resident holdings of AGS as a secondary channel of interest: if foreign investors adjust their exposure to Australian government debt in response to changing relative yields abroad, this offers one plausible mechanism through which a U.S. monetary policy shock could affect Australian yields, alongside the more direct expectations channel captured by the primary specification. Because our holdings data are available only at quarterly frequency and only in aggregate (not disaggregated by investor country), we treat this analysis as descriptive rather than as an independent causal test, consistent with the more general point in this literature that portfolio flows and yields are typically jointly determined.

Finally, this paper builds on a small body of recent Australia-focused empirical work examining how domestic financial conditions are shaped by policy and structural forces, much of it emerging from recent Reserve Bank of Australia research activity. Morley and Wong (2025) examine the extent to which the neutral real interest rate ("r-star") in Australia and six other advanced open economies is driven by global rather than domestic shocks, finding that shocks originating in the United States are nearly

sufficient to explain the global component of r-star across all seven economies, even as local shocks retain an important independent role. While their focus is on the slow-moving neutral rate rather than the high-frequency yield response examined here, their finding that U.S.-originated shocks dominate the global determination of Australian financial conditions is broadly consistent with the transmission channel this paper documents at a much shorter horizon. Elias, Gillitzer, Kaplan, La Cava and Prasad (2025) examine a different stage of the same broader transmission chain, studying how a large RBA tightening cycle passed through to household mortgage repayments and, ultimately, to household spending, finding that Australia's redraw-facility mortgage design and pandemic-era savings buffers muted the effect on spending considerably. Their work is a reminder that the transmission of a monetary policy shock, once it reaches Australian borrowing costs, does not necessarily propagate further into the real economy in a mechanical or uniform way — a caution this paper takes seriously in confining its own claims strictly to the yield and borrowing-cost stage of the chain, rather than extending them to real economic outcomes.

3. Data

This paper draws on monthly and quarterly data spanning 2013 to 2026, sourced entirely from primary, official channels: the Reserve Bank of Australia (RBA), the Australian Office of Financial Management (AOFM), the U.S. Federal Reserve Economic Data service (FRED), and the original authors' own maintained data releases. Each variable is described below in full: its exact source, its native frequency, its available and used sample windows, its unit of measurement and construction, and the specific transformation applied to it in the empirical analysis that follows. The full source details, including table numbers and access locations, are listed separately in the Data Sources section at the end of this paper.

3.1 Primary outcome variable: Australian government bond yields

The dependent variable throughout the main analysis is the yield on Australian Government Securities (AGS), obtained from the Reserve Bank of Australia's Table F2.1, "Capital Market Yields – Government Bonds – Monthly." This table reports the RBA's own assessed yields for Commonwealth Government bonds and is published at monthly frequency. The source table provides yields at the 2-, 3-, 5-, and 10-year maturities, together with a separate Australian Government Indexed Bond series. Of these, we use only the 2-year, 5-year, and 10-year maturities, expressed in per cent per annum; the 3-year maturity and the indexed bond series are excluded, as the paper's yield-curve analysis is organised around the short end (2-year), a mid-curve point (5-year), and the benchmark maturity (10-year), consistent with the maturities most commonly used in the monetary policy transmission literature. The 10-year series is available for the full sample period used in this paper, May 2013 to June 2026 (158 monthly observations); the 2-year and 5-year series begin slightly later, in September 2013 (154 monthly observations), owing to the RBA's own publication history for those maturities. The sample begins in 2013 rather than earlier because the RBA's preceding series (the pre-2013 Table F2, published monthly using a bond-selection and interpolation methodology materially different from the assessed-yield approach used from 2013 onward) is not spliced with the current series, in order to avoid introducing a spurious structural break driven by a change in data construction rather than by economic conditions. In every regression reported in this paper, the dependent variable is the first difference of the yield level — that is, the month-on-month change in percentage points — rather than the level itself, a transformation motivated directly by the stationarity results reported in Section 3.7.

3.2 Identifying instrument: the Jarociński-Karadi shock

The paper's central explanatory variable is the high-frequency monetary policy surprise series developed by Jarociński and Karadi (2020), obtained directly from the lead author's maintained public repository (see Data Sources). The underlying series measures the surprise component of each Federal Open Market Committee announcement, computed from the change in short-term interest rate futures and, in the original authors' construction, equity prices, within a narrow window surrounding each announcement; it is expressed in the same units as the underlying interest rate futures, namely percentage points. The repository provides two related files: a per-meeting raw series (covering each FOMC announcement individually, 1988 to 2024) and a monthly-aggregated series in which all surprises occurring within a given calendar month are summed, with months containing no scheduled FOMC meeting assigned a value of zero. We use the monthly-aggregated combined shock as the primary instrument in the main specification, restricted to the paper's January 2013 to January[1] 2024 sample window; the per-meeting series is used for two further purposes — aggregating to quarterly frequency for the Track 2 non-resident holdings analysis (Section 6.8), and verifying the individual-observation analysis reported in Section 6.6. The original authors further decompose the combined shock into a "pure monetary policy" component and a central bank "information" component; both sub-series are used, at the same monthly aggregation, in the robustness analysis reported in Section 6.2. Over the sample used in this paper, the combined monthly shock ranges from -0.116 to +0.126 percentage points, with a standard deviation of 0.0309 percentage points (Table 1) — substantially smaller than a full one-percentage-point policy surprise, a point of direct relevance to the interpretation of the paper's regression coefficients in Section 5.1.

3.3 Domestic control variable: the RBA Cash Rate Target

[1] The monthly shock series ends in January 2024, so the main estimation sample is truncated at that point.

The RBA Cash Rate Target is obtained from the Reserve Bank of Australia's Table F1.1, "Interest Rates and Yields – Money Market – Monthly," a daily series aggregated by the RBA to a monthly frequency, expressed in per cent per annum. We use the full sample window, May 2013 to June 2026. The main regression sample ends in January 2024 because the Jarociński-Karadi shock series ends then, not because the cash rate ends there . In the main specification, we include the month-on-month change in the Cash Rate Target as the sole contemporaneous control variable, addressing the possibility that a given month's AGS yield movement reflects a concurrent domestic policy decision by the RBA rather than the U.S. shock under study. The Cash Rate Target is also aggregated to quarterly frequency, by taking its end-of-quarter value, for use as a control in the secondary quarterly analysis of Section 6.8.

3.4 Alternative U.S. shock measures

Two further U.S. interest rate series, both obtained from the Federal Reserve Bank of St. Louis's FRED database, are used exclusively as alternative shock measures in the robustness analysis of Section 6.1, rather than as contemporaneous controls in the main specification. The effective Federal Funds Rate (FRED series FEDFUNDS) is a monthly series expressed in per cent per annum, used over the same 2013:M10–2024:M01 regression sample window; we use its month-on-month change. The 10-year U.S. Treasury Constant Maturity Rate (FRED series DGS10) is likewise a monthly series expressed in per cent per annum, used over the same regression sample window; we use its month-on-month change both as an alternative shock measure in Section 6.1 and as the mediating variable in the transmission-path analysis of Section 6.7. Both series are deliberately excluded from the main specification's control set because each is mechanically linked to the same FOMC announcement dates that generate the Jarociński-Karadi shock; including either as a contemporaneous control alongside the shock would risk absorbing part of the effect of interest rather than isolating an independent source of variation, a concern discussed further in Section 4.1.

Where the effective Federal Funds Rate is uninformative owing to the zero lower bound — encompassing, within our sample, the periods 2013–2015 and 2020–2022 — we substitute the shadow rate estimate of Wu and Xia (2016), obtained directly from the maintained data release of Jing Cynthia Wu (see Data Sources), expressed in the same units (per cent per annum) and covering January 1990 to June 2023. As this shadow rate series is not updated beyond June 2023, the plain effective Federal Funds Rate is used for all months from July 2023 through January 2024 in our sample, a period in which the federal funds rate is well clear of the zero lower bound and the shadow rate would in any case closely track the effective rate.

3.5 Secondary data: non-resident holdings of AGS

The secondary, descriptive analysis of Section 6.8 uses two related series published by the Australian Office of Financial Management: the level of non-resident holdings of AGS, expressed in billions of Australian dollars, and total AGS outstanding, expressed in the same units, from which we construct the proportion of AGS held by non-residents as the ratio of the two. Both series are compiled by the AOFM from Australian Bureau of Statistics Balance of Payments and International Investment Position data and are available only at quarterly frequency. We use the full available run of 53[2] quarterly observations, from 2013:Q1 to 2026:Q1. Because no country-disaggregated breakdown of non-resident holdings is published, no claims are made in this paper about the behaviour of investors from any specific foreign jurisdiction. In the regression analysis of Section 6.8, the dependent variable is the quarter-on-quarter percentage change in non-resident holdings, rather than the level, in order to isolate the response of foreign demand to a policy surprise rather than the slower-moving upward trend in holdings that accompanies the broader expansion of Commonwealth debt issuance over the sample; both a contemporaneous and a one-quarter-lagged specification are estimated, the

[2] For the regression analysis in Section 6.8, the sample is limited to 2013:Q1–2024:Q1 (45 quarters for the contemporaneous specification, 44 for the lagged specification) because the quarterly JK shock is only available through 2024:Q1.

latter to allow for the possibility that portfolio adjustments are not fully realised within the same quarter as the shock. Where used in this secondary analysis, the Jarociński-Karadi shock is aggregated to quarterly frequency by summing the already-aggregated monthly values within each calendar quarter.

3.6 Descriptive statistics

Table 1 reports descriptive statistics for the variables used in the main, monthly-frequency analysis.

Table 1. Descriptive Statistics — Track 1 Variables (Monthly, 2013–2024)

Variable	Obs	Mean	Median	Std. Dev.	Min	Max	Skewness	Kurtosis
AGS 2Y yield	154	2.2044	1.9990	1.2639	0.0110	4.6630	-0.0259	2.1125
AGS 5Y yield	154	2.4696	2.2920	1.1992	0.2860	4.6830	-0.1652	2.0048
AGS 10Y yield	158	2.9376	2.7945	1.1655	0.8020	4.9820	-0.1979	1.9734
RBA Cash Rate Target	162	2.1530	2.0000	1.3676	0.1000	4.3500	0.1528	1.9450
JK Shock (combined)	132	-0.0022	0.0000	0.0309	-0.1160	0.1258	0.5387	7.5505
JK Shock (pure policy)	133	-0.0015	-0.0000	0.0299	-0.1649	0.0983	-0.8869	11.3212
JK Shock (information)	132	0.0024	0.0000	0.0158	-0.0441	0.0544	0.4982	5.0611
Wu-Xia Shadow Rate	126	1.6971	1.0921	3.0869	-2.9856	6.2589	0.3277	1.7952
FEDFUNDS	162	1.7817	1.0950	1.8942	0.0500	5.3300	0.7303	1.9912
US 10Y Yield	162	2.6658	2.4650	1.0923	0.5500	4.8800	0.2220	2.1114

(DGS10)								

[3]

Notes: Sample period is 2013:M5–2026:M6 for yield, cash rate, and FRED variables, and 2013:M1–2024:M1 for the Jarociński–Karadi shock series. AGS 2-year and 5-year yields are available from September 2013 onward (n=154); AGS 10-year yield n=158; RBA Cash Rate Target, FEDFUNDS, and DGS10 n=162; Wu-Xia Shadow Rate n=126; JK Shock (combined) n=132; JK Shock (pure policy) n=133; JK Shock (information) n=132. JK Shock kurtosis values well above 3 (7.55 for the combined shock, 11.32 for the pure-policy component, 5.06 for the information component) reflect the zero-inflated, fat-tailed structure typical of high-frequency surprise measures — most FOMC meetings generate small or no surprise, with a small number of large outliers (e.g. September 2022, June 2023). The source data (RBA Table F2.1) also contains 3-year AGS yields and an Australian Government Indexed Bond series; these are excluded from the analysis as the paper's yield-curve focus is defined by the short end (2Y), the benchmark maturity (10Y), and a mid-curve point (5Y) — consistent with the standard maturities used in the monetary-policy transmission literature.

The elevated kurtosis of the combined and pure-policy shock series (7.55 and 11.32, respectively, against a value of 3 for a normal distribution) reflects the zero-inflated, fat-tailed structure characteristic of high-frequency surprise measures: the majority of months carry a small or zero surprise, punctuated by a small number of unusually large observations, most notably around the September 2022 and June 2023 FOMC meetings.

3.7 Stationarity

Table 2 reports Augmented Dickey-Fuller (Dickey and Fuller, 1979) and KPSS (Kwiatkowski, Phillips, Schmidt and Shin, 1992) test results for the levels and first differences of each series used in the main specification.

[3] All variables are in percentage points (AGS 2Y/5Y/10Y, Cash Rate, JK Shock and components, Wu-Xia, FEDFUNDS, DGS10).

Table 2. Unit Root and Stationarity Tests

Variable	Obs	ADF Stat	ADF p-val	ADF Stationary ?	KPSS Stat	KPSS p-val	KPSS Stationary?
AGS 2Y	154	-1.1194	0.7073	No	0.6051	0.0222	No
AGS 5Y	154	-0.8593	0.8011	No	0.5718	0.0255	No
AGS 10Y	158	-0.9859	0.7584	No	0.5239	0.0363	No
RBA Cash Rate	162	-1.2388	0.6567	No	0.5332	0.0342	No
JK Shock Combined	132	-6.0542	0.0000	Yes	0.5786	0.0246	No
FEDFUNDS	162	-1.9779	0.2963	No	1.1836	0.0100	No
DGS10	162	-0.9185	0.7818	No	0.8248	0.0100	No

First differences (all series):

Variable	ADF Stat	p-val	Conclusion
ΔAGS 2Y	-4.1576	0.0008	I(0)
ΔAGS 5Y	-8.8804	0.0000	I(0)
ΔAGS 10Y	-9.2073	0.0000	I(0)
ΔRBA Cash Rate	-3.8793	0.0022	I(0)
ΔJK Shock	-8.6993	0.0000	I(0)
ΔFEDFUNDS	-3.4756	0.0086	I(0)
ΔDGS10	-12.3096	0.0000	I(0)

Notes: All level series are non-stationary (fail to reject a unit root under ADF, and/or reject stationarity under KPSS), consistent with the persistent, trending nature of interest rate series. All series become stationary in first differences. This motivates modelling yield changes rather than levels throughout the paper. The JK shock shows a mild disagreement between ADF (stationary) and KPSS (non-stationary) in levels, plausibly reflecting its zero-inflated, fat-tailed structure (see Table 1); this does not affect the main specification, which uses first differences throughout.

All series are found to be non-stationary in levels — consistent with the well-documented persistence of interest rate series — but stationary in first differences. This finding motivates the paper's use of yield and rate changes, rather than levels, as both the dependent and explanatory variables throughout the empirical analysis that follows.

4. Methodology

4.1 Baseline specification

The paper's starting point is a simple, transparent regression of the monthly change in each AGS yield maturity on the Jarociński-Karadi shock, with the contemporaneous change in the RBA Cash Rate Target included as a control:

$$\Delta y_{m,t} = \alpha + \beta \cdot JK_t + \gamma \cdot \Delta Cash_t + \varepsilon_t$$

where $\Delta y_{m,t}$ denotes the change in the AGS yield of maturity m between month $t-1$ and month t, JK_t is the monthly-aggregated Jarociński-Karadi shock, and $\Delta Cash_t$ is the change in the RBA Cash Rate Target over the same month. The coefficient of interest, β, measures the change in the Australian yield associated with a

one-percentage-point Jarociński-Karadi surprise. Standard errors are computed using the Newey-West heteroskedasticity- and autocorrelation-consistent (HAC) estimator (Newey and West, 1987), with a fixed lag length of one month, a choice justified directly by the diagnostic tests reported in Section 4.3 below, rather than adopted as a default.

The Federal Funds Rate and the U.S. 10-year Treasury yield are deliberately excluded from this baseline specification, notwithstanding their conceptual relevance to U.S. monetary conditions. Both variables move mechanically around the same FOMC announcement dates that generate the Jarociński-Karadi shock; their inclusion as contemporaneous controls would risk absorbing part of the very effect the paper seeks to estimate, a form of what is sometimes termed "bad control" bias. They are instead employed only as alternative shock measures in the robustness analysis of Section 6, where their omission as controls does not arise.

4.2 Local Projections

To trace the dynamic path of the yield response beyond the month of impact, the paper estimates a Local Projections model following Jordà (2005). For each horizon h = 0, 1, ..., 12 months, a separate regression is estimated:

$$\Delta y_{m,t+h} = \alpha_h + \beta_h \cdot JK_t + \gamma_h \cdot \Delta Cash_t + \varepsilon_{t+h}$$

The resulting sequence of coefficients, $\{\beta_h\}$, traces the impulse response of the Australian yield to a Jarociński-Karadi shock over a twelve-month horizon, without imposing the restrictive dynamics implicit in a vector-autoregressive framework. Newey-West standard errors are again used at each horizon, with the lag length set to h + 1 months at each horizon h, following standard practice for Local Projections with overlapping horizons, so that the bandwidth scales directly with the degree of serial correlation induced by the overlap.

4.3 Justification of HAC standard errors

Prior to estimation, the residuals of the baseline specification (Section 4.1) were tested for heteroskedasticity, using the Breusch-Pagan test, and for serial correlation, using the Breusch-Godfrey test. No evidence of heteroskedasticity was found at any maturity; however, all three maturities exhibited statistically significant serial correlation. This finding directly motivates the use of Newey-West HAC standard errors (Newey and West, 1987) throughout the paper's regression and Local Projections output, in place of conventional OLS standard errors, which would otherwise understate the true sampling variability of the estimated coefficients.

Table 3. Heteroskedasticity and Serial Correlation Tests (OLS Residuals)

Maturity	BP Stat	BP p-val	Heteroskedasticity?	BG Stat	BG p-val	Serial Correlation?
ΔAGS 2Y	4.5969	0.1004	No	11.4003	0.0007	Yes
ΔAGS 5Y	5.6360	0.0597	No	13.0339	0.0003	Yes
ΔAGS 10Y	2.8949	0.2352	No	12.2944	0.0005	Yes

Notes: Residuals from the baseline regression (Δyield on jk_shock and ΔRBA cash rate, n=124) show no evidence of heteroskedasticity (Breusch-Pagan) but clear evidence of serial correlation (Breusch-Godfrey) across all three maturities. This motivates the use of HAC (Newey-West) standard errors throughout the paper's regression and Local Projections output.

4.4 An abandoned identification strategy: LP-IV

An earlier stage of this paper's analysis attempted a more elaborate identification strategy, following the external-instruments approach of Stock and Watson (2018) and Gertler and Karadi (2015): instrumenting the change in the effective Federal Funds Rate with the Jarociński-Karadi shock, in order to scale the estimated yield response to a one-unit change in the U.S. policy indicator rather than to the shock itself. This specification was abandoned after its first-stage F-statistic was found to be 1.25, far below the conventional threshold of 10 used to rule out weak-instrument bias (Stock and Watson, 2018). Given that the Federal Funds Rate frequently does not move at all in a given month, even in the presence of a meaningful information surprise, it is a poor first-stage predictor for this purpose, and the resulting second-stage estimates were unstable and, in several cases, incorrectly signed. We report the baseline specification of Section 4.1 as the paper's main causal estimate instead, on the basis that the Jarociński-Karadi shock's construction from a narrow, high-frequency announcement window already satisfies the exogeneity condition required for causal identification, without requiring a separate first-stage instrumentation of the policy rate itself.

4.5 Robustness methodology

Section 6 reports a series of robustness checks designed to interrogate the baseline result along several dimensions: alternative measures of the U.S. monetary policy shock; the two structural sub-components of the Jarociński-Karadi shock (pure policy and central bank information); subsample stability across the pre-COVID, post-COVID, and 2022–2023 tightening-cycle periods; a formal Chow (1960) test for a structural break in the estimated coefficient; a placebo test using randomly permuted shock dates; and asymmetry between hawkish and dovish shocks. Each of these is described in full alongside its results in Section 6, rather than in the abstract here, so that the

methodological rationale for each check is presented together with the finding it produces.

4.6 Secondary analysis: mediation via the U.S. 10-year yield

To examine whether part of the estimated effect operates through co-movement in the U.S. 10-year Treasury yield, consistent with the global portfolio-rebalancing channel discussed in Section 2, the paper estimates two auxiliary regressions, each using the same Newey-West HAC approach described in Section 4.1: the response of the change in the U.S. 10-year yield to the Jarociński-Karadi shock, and the response of the change in the AGS yield to the change in the U.S. 10-year yield. Formally, this involves two regressions:

$$\Delta DGS10_t = \gamma \cdot JK_t + \varepsilon_t$$
$$\Delta AGS_t = \delta \cdot \Delta DGS10_t + \varepsilon_t$$

The estimated indirect effect is given by the product $\gamma \cdot \delta$, expressed as a share of the total direct effect β estimated in Section 4.1. This exercise is descriptive rather than a formal causal mediation analysis in the sense of the broader mediation-analysis literature, and is presented as suggestive evidence of a plausible transmission mechanism rather than as an independently identified causal channel.

4.7 Secondary analysis: non-resident holdings

The quarterly analysis of non-resident AGS holdings (Section 6) follows the same basic regression logic as Section 4.1, applied to the quarterly-aggregated Jarociński-Karadi shock and the quarterly change in non-resident holdings, with and without a one-quarter lag between the shock and the holdings response. Both specifications use Newey-West HAC standard errors with a fixed lag length of two quarters, set manually to allow for mild serial correlation in the

quarterly residuals while preserving degrees of freedom, given the small sample size (n = 45 for the contemporaneous specification; n = 44 for the lagged specification). Consistent with the discussion in Section 2 and Section 3.4, this analysis is presented as descriptive evidence of a possible transmission channel rather than as an independently identified causal estimate, given the aggregate (non-country-disaggregated) nature of the holdings data and the coarser quarterly frequency at which it is available.

5. Results

5.1 Baseline effect

Table 4 reports estimates of the baseline specification set out in Section 4.1, for each of the three AGS maturities examined, over a common regression sample of 124 monthly observations (see Table 4, note 1).

Table 4. *Baseline OLS/HAC Regression (h = 0).* Dependent variable: Δyield. Newey-West standard errors in parentheses. n = 124[4].

Maturity	**β (jk_shock)**	**HAC SE**	**p-val**	**γ (ΔCash Rate)**	**HAC SE**	**p-val**	**R^2**	**n**
ΔAGS 2Y	1.4684	0.5322	0.0058	0.3797	0.1538	0.0140	0.1740	124
ΔAGS 5Y	1.5827	0.5807	0.0064	0.1875	0.1524	0.2190	0.1116	124
ΔAGS 10Y	1.4493	0.5952	0.0149	0.0981	0.1494	0.5120	0.0657	124

[4]The regression sample is restricted uniformly to n = 124 across all three maturities — including the 10-year yield, for which a longer sample is separately available (Table 1) — so that all three maturities are estimated over an identical common sample period, ensuring the results are directly comparable across the yield curve.

Notes: A JK monetary policy surprise has a statistically significant, positive effect on Australian government bond yields at all three maturities, consistent with the expected direction (a hawkish surprise raises yields).

The Jarociński-Karadi shock enters with a positive and statistically significant coefficient at every maturity: 1.47 for the 2-year yield ($p = 0.006$), 1.58 for the 5-year yield ($p = 0.006$), and 1.45 for the 10-year yield ($p = 0.015$). The sign accords with theoretical expectation — a hawkish surprise raises Australian yields — and the magnitude is not trivial. Because both the shock and the dependent variable are expressed in percentage points, a coefficient of 1.45 implies that a full one-percentage-point surprise would be associated with a 1.45 percentage point movement in the 10-year yield; no surprise of that magnitude occurs within our sample, however, so this scaling is best understood as a slope rather than as a description of a realistic event. A more informative benchmark is the standard deviation of the shock itself, 0.0309 percentage points (Table 1): a one-standard-deviation surprise is associated with a movement of approximately four basis points at each maturity, while the largest surprise observed in the sample, occurring in September 2022 at approximately 12.6 basis points, is associated with a movement on the order of eighteen to twenty basis points across the yield curve, as detailed in Figure 1 below. The RBA Cash Rate control is significant only at the 2-year maturity, consistent with the short end of the curve being more directly exposed to the domestic policy rate than the belly or long end.

As an illustration of how the model's two components combine in practice, consider September 2022, the month containing the largest observed Jarociński-Karadi shock in the sample (approximately 12.6 basis points). The Reserve Bank of Australia also raised the cash rate by 44 basis points that same month. Combining the fitted contributions of both the shock and the cash rate control from the baseline specification, the model's fitted value for the 2-year yield closely matches the actual observed change that month, leaving a residual of approximately zero. At the 10-year maturity, where the

cash rate's estimated coefficient is smaller and statistically insignificant (Table 4), a larger unexplained residual of approximately 15 basis points remains, reflecting other contemporaneous influences not captured by either regressor. This single month is illustrative rather than representative — with an R^2 of 0.07 to 0.17 across maturities, no individual observation should be expected to be fully explained by the model — but it demonstrates concretely how the shock and the domestic policy rate jointly, rather than the shock in isolation, account for a given month's yield movement.

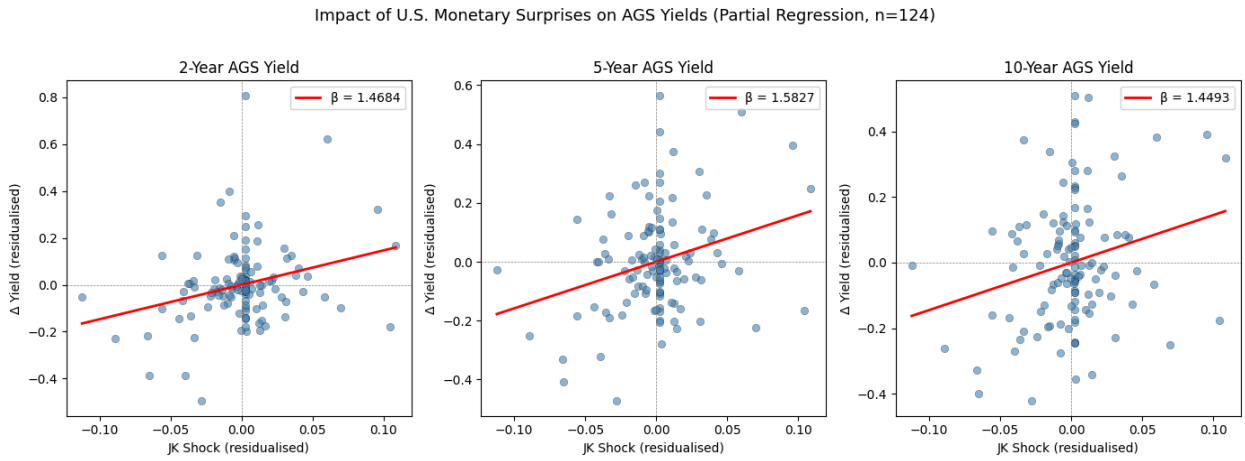


Fig 1.

The reported coefficients, expressed in percentage points (β = 1.4684, 1.5827, and 1.4493 for the 2-, 5-, and 10-year maturities, respectively) are regression slopes, not observed effect sizes: each represents the yield change implied by a hypothetical one-percentage-point (100 basis point) Jarociński-Karadi shock. No shock of this magnitude occurs within the sample — the largest observed shock is approximately 0.126 percentage points (12.6 basis points), and the standard deviation of the shock series is 0.0309 percentage points (Table 1). Scaled to the 0.10 percentage point (10 basis point) benchmark used throughout this paper, these slopes imply a yield response of approximately 14.7, 15.8, and 14.5 basis points for the 2-, 5-, and 10-year maturities, respectively. Scaled instead to the largest observed shock in the sample (12.6 basis points, September 2022) the implied response is approximately 18.5 basis points for the 2-year, 19.9 basis points for the 5-year, and 18.3 basis points for the 10-year maturity. The steepness of the fitted line in this figure should accordingly be read as the estimated rate of

response, not as a description of the yield movements actually observed in any single month of the sample.

5.2 Dynamic response

Table 5 reports the Local Projections estimates described in Section 4.2, tracing the response of each yield to a Jarociński-Karadi shock over a horizon of twelve months.

Table 5. Local Projections, h = 0 to 12 months. Newey-West standard errors, adjusted for serial correlation induced by overlapping horizons.

ΔAGS 2Y

h	β	SE	p-val
0	1.4684	0.5322	0.0058
1	1.1702	0.6855	0.0878
2	0.3555	0.5977	0.5520
3	-0.4431	0.6750	0.5115
4	-0.1567	0.3981	0.6939
5	1.0141	0.4554	0.0260
6	-0.3362	0.5216	0.5193
7	-0.6667	0.6344	0.2933
8	-0.4222	0.3723	0.2567
9	0.7351	0.6942	0.2897
10	0.7743	0.4365	0.0761
11	0.0471	0.5853	0.9359

12	-0.5037	0.3971	0.2046

ΔAGS 5Y

h	β	SE	p-val
0	1.5827	0.5807	0.0064
1	1.0668	0.5146	0.0382
2	-0.0704	0.5950	0.9058
3	-0.2047	0.6569	0.7554
4	0.0851	0.4720	0.8570
5	0.5048	0.3886	0.1940
6	-0.6732	0.5484	0.2196
7	-0.4361	0.5613	0.4373
8	-0.6068	0.3347	0.0698
9	0.5579	0.6231	0.3706
10	0.7508	0.3873	0.0525
11	0.0319	0.5573	0.9544
12	-0.4239	0.4045	0.2947

ΔAGS 10Y

h	β	SE	p-val
0	1.4493	0.5952	0.0149
1	1.3175	0.5104	0.0098
2	-0.2497	0.7261	0.7309
3	-0.0575	0.6431	0.9287
4	0.3440	0.5147	0.5039
5	0.1355	0.4400	0.7582
6	-0.9964	0.5825	0.0872
7	-0.1923	0.5550	0.7290
8	-0.4595	0.4410	0.2974
9	0.3574	0.5221	0.4936
10	0.8735	0.4137	0.0348
11	-0.0018	0.5942	0.9976
12	-0.2805	0.4166	0.5007

Notes: The effect of a JK shock is largest and most significant at impact (h=0) and persists weakly through h=1, before fading to statistical insignificance from h=2 onward. This indicates rapid market absorption of the policy surprise, consistent with efficient-markets pricing, rather than a slow-building or long-lived transmission process.

The response is concentrated almost entirely at the point of impact and the following month. At h = 0, the coefficient is significant at all three maturities; at h = 1, it remains significant for the 5- and 10-year maturities (p = 0.038 and p = 0.0098, respectively) and marginal for the 2-year maturity (p = 0.088). This modest difference in persistence across the curve is consistent with the mediation finding of Section 6.7: a larger share of the longer-maturity response operates through the slower-moving U.S. 10-year yield channel, which plausibly takes slightly longer to fully pass through than the more immediate policy-expectations channel that dominates at the short end. From h = 2 onward, the estimated coefficients lose statistical significance across all maturities and

fluctuate considerably, with confidence bands remaining wide throughout the horizon — although an isolated significant coefficient reappears at h = 10 for the 10-year maturity (p = 0.035), this occurs without a corresponding pattern at neighbouring horizons or at shorter maturities, and is more plausibly attributable to sampling variation across the twelve tested horizons than to a genuine delayed effect. This overall shape is consistent with rapid incorporation of the policy surprise into bond prices, a finding in keeping with the efficient processing of public information that the high-frequency identification literature presupposes (Kuttner, 2001; Gürkaynak, Sack and Swanson, 2005), rather than with a gradual or delayed transmission mechanism.

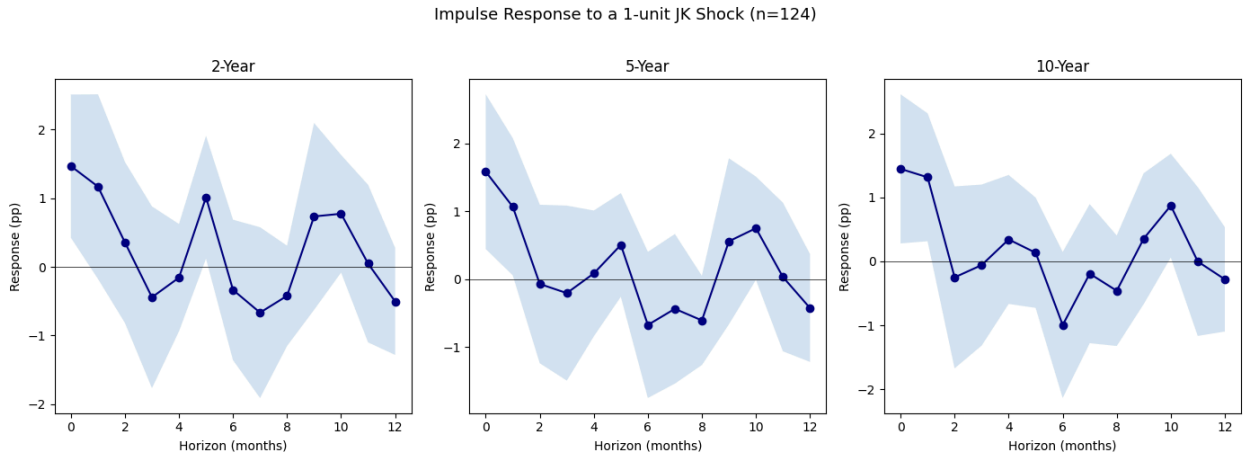


Fig 2.

Note: Each panel traces the estimated response of the AGS 2-year, 5-year, or 10-year yield to a Jarociński-Karadi shock over a horizon of h = 0 to 12 months, estimated via Local Projections (Table 5). As in Figure 1, the reported coefficients are regression slopes scaled to a hypothetical one-percentage-point (100 basis point) shock, not observed effect sizes; no shock of this magnitude occurs within the sample. The response is largest at h = 0, the month of the shock, and declines sharply thereafter, becoming statistically insignificant from h = 2 onward in all three panels — indicating that the yield adjustment is concentrated within the month of the surprise and the following month, with no evidence of a persistent or delayed effect. Shaded bands, where shown, represent 95 per cent confidence intervals based on Newey-West standard errors. All variables are expressed in percentage points.

Taken together, the results in this section establish that a U.S. monetary policy surprise produces an immediate, statistically reliable increase in Australian government bond yields across the maturity spectrum examined, with the effect fully realised within approximately one month of the shock. Section 6 examines the stability, robustness, and likely transmission mechanism of this finding in greater detail.

6. Robustness

This section subjects the baseline finding of Section 5 to a series of checks designed to establish whether the estimated effect is genuine, stable, and attributable to the specific mechanism the paper claims, rather than an artefact of a particular specification, sample period, or shock measure.

6.1 Alternative shock measures

Table 6 replaces the Jarociński-Karadi shock with two alternative measures of U.S. monetary conditions: the plain change in the effective Federal Funds Rate, and the change in the U.S. 10-year Treasury yield.

Table 6. Robustness: Alternative Shock Measures (h = 0).

Shock	**Maturity**	**β**	**SE**	**p-val**	**R^2**
ΔFEDFUNDS	ΔAGS 2Y	0.0711	0.1617	0.6600	0.1065
ΔFEDFUNDS	ΔAGS 5Y	0.0453	0.1497	0.7620	0.0330

ΔFEDFUNDS	ΔAGS 10Y	0.0460	0.1455	0.8150	0.0113
ΔDGS10	ΔAGS 2Y	0.3410	0.0722	0.0000	0.3211
ΔDGS10	ΔAGS 5Y	0.4144	0.0532	0.0000	0.3457
ΔDGS10	ΔAGS 10Y	0.5111	0.0490	0.0000	0.4052

Notes: The plain change in the Federal Funds Rate shows no significant relationship with AGS yields — confirming that it is the surprise component of U.S. monetary policy, not the policy rate itself, that drives the transmission. By contrast, changes in the U.S. 10-year yield (DGS10) show a strong, highly significant co-movement with AGS yields at all maturities, with higher explanatory power (R^2) than the JK shock alone — supporting a global benchmark-yield transmission channel (see Table 12).

The change in the Federal Funds Rate shows no significant relationship with any AGS maturity (p ranging from 0.60 to 0.81), reinforcing the paper's central identification argument: it is the surprise embedded in a Federal Reserve announcement, not the level of the policy rate itself, that Australian yields respond to. The change in the U.S. 10-year yield, by contrast, is strongly significant at every maturity, with an R^2 of 0.32 to 0.41 — several times larger than both the Federal Funds Rate specification and the baseline Jarociński-Karadi specification reported in Table 4 (R^2 of 0.07 to 0.17). This latter result is not treated as a competing causal estimate, since the U.S. 10-year yield is not plausibly exogenous with respect to Australian bond market conditions in the way the Jarociński-Karadi shock is constructed to be; rather, its strong explanatory power here foreshadows the substantial mediation share — rising to over 70 per cent at the 10-year maturity — formally estimated in Section 6.7.

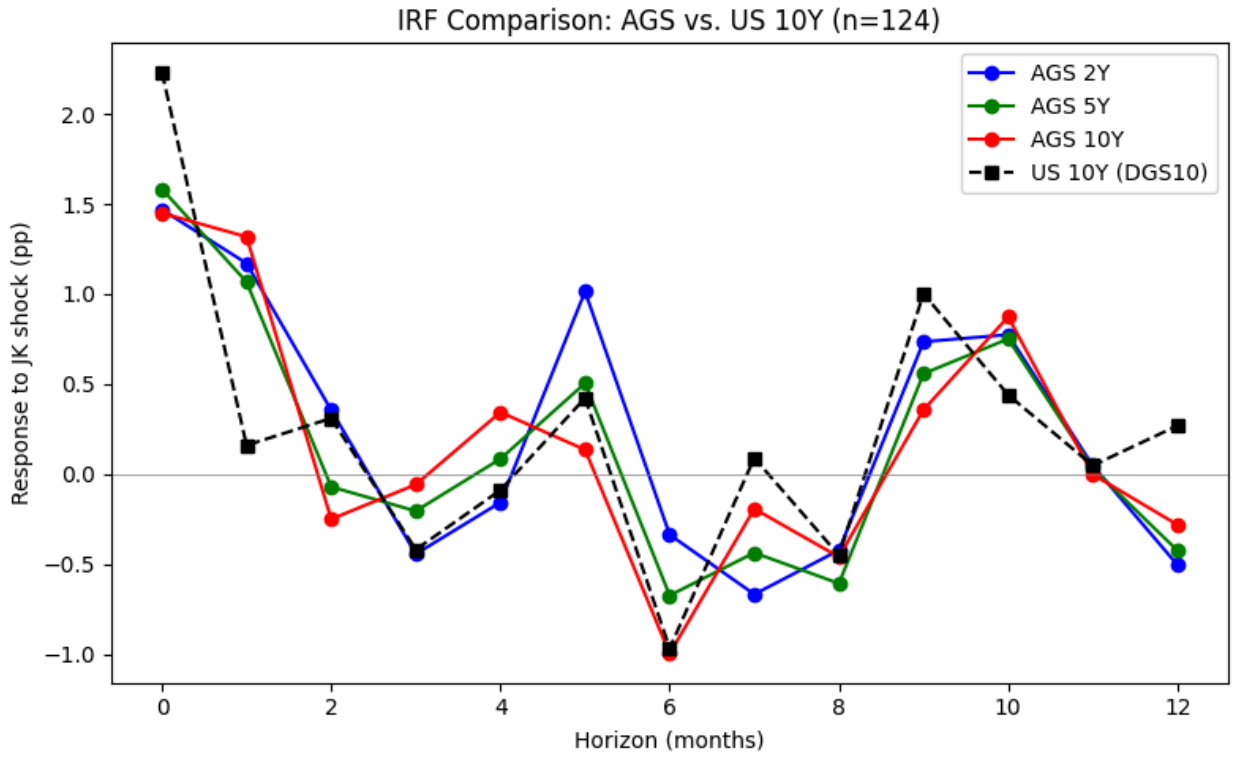


Fig 3.

Note: This figure plots four lines on a single chart — the response of the U.S. 10-year Treasury yield (DGS10) and the responses of the AGS 2-, 5-, and 10-year yields — to a Jarociński-Karadi shock over a horizon of h = 0 to 12 months, all scaled to a hypothetical one-percentage-point shock. The U.S. 10-year yield responds more strongly and immediately than any AGS maturity at every horizon, consistent with the shock originating in, and being priced first into, U.S. markets before transmitting to Australian yields. This pattern motivates the mediation analysis in Table 12, under which a substantial and maturity-increasing share of the total AGS response is estimated to operate indirectly through this benchmark-yield channel. All variables are expressed in percentage points.

6.2 Decomposing the shock

Table 7 re-estimates the baseline specification separately for the two structural sub-components of the Jarociński-Karadi shock identified in the original decomposition: the "pure policy" surprise and the central bank "information" surprise.

Table 7. Robustness: Jarociński-Karadi Sub-Components (h = 0).

Component	Maturity	β	SE	p-val
Pure Policy	ΔAGS 2Y	1.7413	0.4912	0.0004
Pure Policy	ΔAGS 5Y	1.8765	0.5586	0.0008
Pure Policy	ΔAGS 10Y	1.6750	0.5842	0.0041
Information	ΔAGS 2Y	-0.3122	0.6588	0.6356
Information	ΔAGS 5Y	-0.1113	0.7852	0.8873
Information	ΔAGS 10Y	0.0994	1.0015	0.9210

Notes: Decomposing the combined JK shock following Jarociński and Karadi (2020), the "pure policy" component is significant and positive at all maturities, while the "information" (Fed information effect) component shows no significant relationship. This indicates that Australian yields respond specifically to surprises about the policy rate path, not to information the Fed reveals about the economic outlook.

The pure policy component is significant and positive at every maturity, with coefficients (1.74, 1.87, and 1.67 for the 2-, 5-, and 10-year maturities) somewhat larger than those of the combined shock reported in Table 4 (1.47, 1.58, and 1.45). This is consistent with the information component diluting the combined shock's estimated effect: since the

information component is not significant at any maturity and, for the 2- and 5-year yields, points in the opposite direction to the pure policy component, combining the two into a single shock measure understates the strength of the underlying policy-surprise channel relative to isolating it directly. This indicates that the transmission documented in this paper operates through the genuine policy-surprise channel rather than through markets updating their beliefs about the Federal Reserve's private assessment of U.S. economic conditions, a distinction that matters both for the economic interpretation of the result and, as Jarociński and Karadi (2020) note, for avoiding the sign reversals that can arise from failing to separate the two.

6.3 Subsample stability

Table 8 re-estimates the baseline specification separately for the pre-COVID period (2013–2019), the post-COVID period (2020–2024:01), and the 2022–2023 tightening cycle.

Table 8. Robustness: Subsample Splits (h = 0, Jarociński-Karadi shock)

Subsample	**Maturity**	**β**	**SE**	**p-val**	**n**
Pre-COVID (2013–2019)	ΔAGS 2Y	0.5684	0.3889	0.1439	75
Pre-COVID (2013–2019)	ΔAGS 5Y	0.4236	0.5643	0.4528	75
Pre-COVID (2013–2019)	ΔAGS 10Y	0.2170	0.6075	0.7210	75
Post-COVID (2020–2024)	ΔAGS 2Y	2.1927	0.9261	0.0178	49
Post-COVID (2020–2024)	ΔAGS 5Y	2.4521	0.9161	0.0074	49
Post-COVID (2020–2024)	ΔAGS 10Y	2.3062	0.9150	0.0117	49
Hiking Cycle	ΔAGS 2Y	2.5386	1.1539	0.0278	24

(2022–2023)					
Hiking Cycle (2022–2023)	ΔAGS 5Y	2.9183	1.1285	0.0097	24
Hiking Cycle (2022–2023)	ΔAGS 10Y	2.7862	1.1166	0.0126	24

Notes: All coefficients represent the yield response, in percentage points, to a hypothetical 1 percentage point (100 basis point) shock — a magnitude never observed anywhere in the sample (maximum observed shock: approximately 12.6 basis points, September 2022). Scaled to a more representative 10 basis point shock, the post-COVID coefficients imply a yield response of approximately 21.9, 24.5, and 23.1 basis points for the 2-, 5-, and 10-year maturities, respectively, compared with 14.7, 15.8, and 14.5 basis points implied by the full-sample coefficients in Table 4.

The effect is statistically indistinguishable from zero in the pre-COVID subsample at every maturity, but is significant and considerably larger in both the post-COVID subsample and the 2022–2023 tightening-cycle subsample — roughly four times larger at the 2-year maturity, six times larger at the 5-year maturity, and over ten times larger at the 10-year maturity, though these multiples should be read with some caution given that the pre-COVID point estimates themselves are imprecisely estimated and statistically insignificant. This finding is not a minor qualification to the paper's headline result: it indicates that the transmission of U.S. monetary policy surprises to Australian yields is state-dependent rather than constant, and that the pooled full-sample coefficient reported in Table 4 is materially shaped by the more recent portion of the

sample. Section 6.4 formalises this observation with a structural break test, and Section 7 discusses its interpretation.

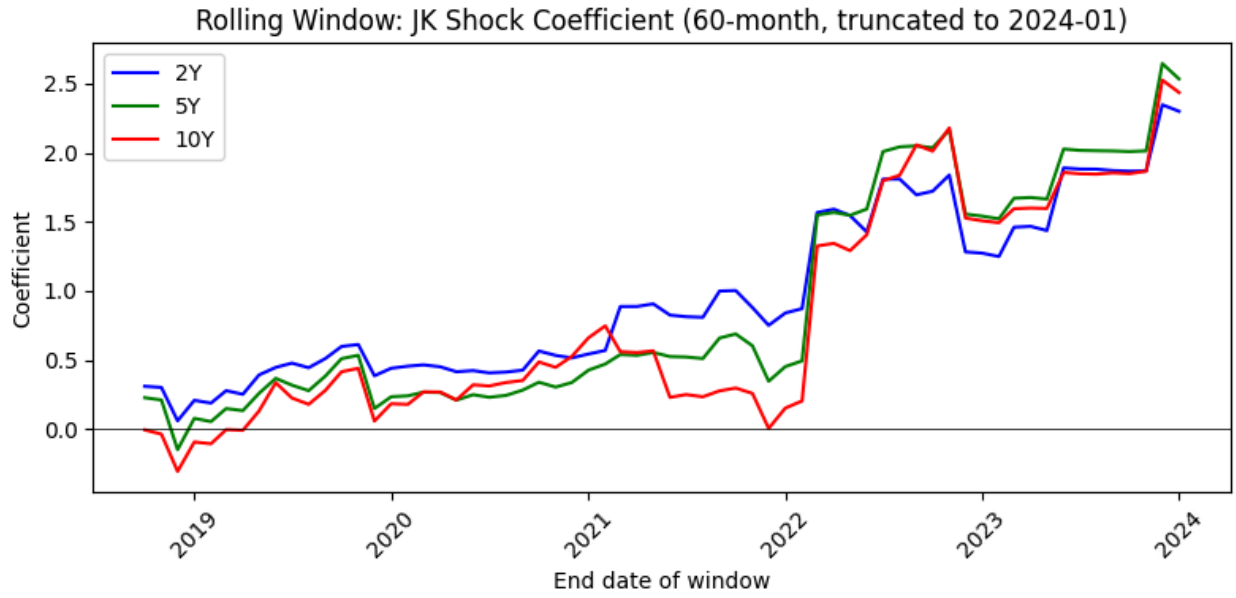


Fig 4.

Note: This figure re-estimates the baseline coefficient (Table 4) over a rolling 60-month window, with three lines on a single chart representing the 2-, 5-, and 10-year maturities together. All three lines stay low and relatively flat for most of the sample, then rise sharply and together from around 2022 onward, climbing from near zero to above 2. This provides visual confirmation of the subsample (Table 8) and structural break (Table 9) findings: the relationship between the Jarociński-Karadi shock and AGS yields is not stable across the sample, but strengthens markedly and consistently across all three maturities in the more recent period. All coefficients are expressed in percentage points, representing the response to a hypothetical one-percentage-point shock.

6.4 Structural break test

Table 9 reports Chow (1960) test statistics for a structural break in the estimated coefficient at two candidate dates: January 2020, marking the onset of the COVID period, and March 2022, marking the beginning of the Federal Reserve's tightening cycle.

Table 9. Robustness: Chow Structural Break Test.

Maturity	Break Date	F-stat	p-value
ΔAGS 2Y	Jan 2020	1.8465	0.1425
ΔAGS 2Y	Mar 2022	2.9400	0.0360
ΔAGS 5Y	Jan 2020	3.2412	0.03246
ΔAGS 5Y	Mar 2022	2.5140	0.0618
ΔAGS 10Y	Jan 2020	3.2448	0.0245
ΔAGS 10Y	Mar 2022	2.2212	0.0893

Notes: A formal Chow test confirms a statistically significant structural break around January 2020 for the 5-year and 10-year maturities, but not for the 2-year. A break around March 2022 is significant only for the 2-year maturity, while the 5-year and 10-year maturities do not show a significant break at that date. This formalises the subsample finding (Table 8) and indicates the transmission channel strengthened around the onset of the COVID period, with the 2022 hiking cycle marking a more limited, maturity-specific shift in the estimated relationship.

A statistically significant break is detected at January 2020 for the 5-year and 10-year maturities ($p = 0.032$ and $p = 0.025$, respectively), though not for the 2-year maturity. A separate break at March 2022 is significant only for the 2-year maturity ($p = 0.036$), but not for the 5-year or 10-year maturities. This formal result refines the subsample finding of Section 6.3: rather than the transmission channel strengthening specifically with the onset of the 2022 tightening cycle, the more precisely dated break appears to coincide with the broader disruption to global financial markets from early 2020 onward. Notably, the maturities for which the break is statistically confirmed, the 5- and 10-year yields — are also those showing the largest post-COVID multipliers in Section 6.3, lending further

coherence to the two results as complementary evidence of the same underlying regime shift.

6.5 Placebo test

As a further check against spurious findings, Table 10 reports the results of a placebo exercise in which the Jarociński-Karadi shock series is randomly permuted across 1,000 draws, and the baseline regression re-estimated on each permuted series.

Table 10. Robustness: Placebo Test (1,000 permutations).

Maturity	**True β**	**Placebo p-val**
ΔAGS 2Y	1.4684	0.0010
ΔAGS 5Y	1.5827	0.0010
ΔAGS 10Y	1.4493	0.0040

Notes: The true JK-shock coefficient falls in the extreme tail of a distribution generated from 1,000 randomly permuted "placebo" shock dates, for all three maturities. This provides strong evidence that the estimated effect reflects a genuine relationship rather than a spurious or chance finding.

The true, unpermuted coefficient falls within the extreme tail of the resulting placebo distribution at every maturity (p = 0.001, 0.001, and 0.004 for the 2-, 5-, and 10-year yields, respectively) indicating that a coefficient of this magnitude would be highly unlikely to arise from a randomly assigned shock series. This provides direct evidence

against the possibility that the baseline result reflects chance correlation rather than a genuine relationship between the Jarociński-Karadi shock and Australian yields.

As a further check, the placebo exercise was re-estimated restricted to the post-2020 period alone (n = 49). The 5- and 10-year placebo p-values fall further (to 0.000 and 0.005, respectively), consistent with a stronger, more consistent effect in this subperiod; the 2-year p-value rises modestly (to 0.011), remaining solidly significant but not strengthening in the same way. This pattern mirrors the structural break results in Section 6.4, where a significant break is confirmed for the 5- and 10-year maturities but not the 2-year, reinforcing the interpretation that the post-2020 regime shift is most pronounced at the belly and long end of the curve.

6.6 Hawkish–dovish asymmetry

Table 11 splits the Jarociński-Karadi shock into hawkish (positive) and dovish (negative) observations and estimates the baseline specification separately on each subsample.

Table 11. Robustness: Hawkish vs. Dovish Asymmetry (h = 0)

Direction	Maturity	β	SE	p-val	n
Hawkish	ΔAGS 2Y	0.2622	1.3535	0.8464	31
Hawkish	ΔAGS 5Y	0.5777	1.3743	0.6742	31
Hawkish	ΔAGS 10Y	0.3897	1.3562	0.7738	31
Dovish	ΔAGS 2Y	2.2925	0.7940	0.0039	51
Dovish	ΔAGS 5Y	2.2398	0.8814	0.0110	51
Dovish	ΔAGS 10Y	1.9137	0.9176	0.0370	51

Dispersion (Std. Dev. of Δyield within group):

Maturity	Hawkish σ	Dovish σ	Zero σ
2Y	0.1884	0.1418	0.1788
5Y	0.1887	0.1516	0.1734
10Y	0.1977	0.1725	0.1780

Notes: While hawkish shocks produce larger average absolute yield moves (see paired figure), the pooled hawkish-only regression is not statistically significant, whereas dovish shocks are significant at all maturities. Inspection of individual hawkish months shows this reflects regime instability rather than a true directional asymmetry: hawkish surprises before the ~January 2020 structural break (Table 9) produced inconsistent, sometimes negative, yield responses, while post-break hawkish surprises (e.g. March, June, and September 2022) produced large, consistently positive responses. Dovish shocks show a more stable relationship across the full sample. Hawkish shocks also show higher dispersion (σ) than dovish shocks at every maturity, consistent with this explanation. In the corrected regression sample (n=124), hawkish months number 31 and dovish months 51, with the remaining 42 months classified as zero-shock months.

At first inspection, this result appears to sit awkwardly alongside a simple comparison of average yield movements by shock direction, which shows hawkish months producing larger average absolute yield changes than dovish months at every maturity. Yet the formal regression shows the opposite pattern for statistical reliability: dovish shocks are significant at every maturity (p ranging from 0.004 to 0.037), while hawkish shocks are not significant at any maturity, despite the larger average movement. This apparent tension is resolved by examining the dispersion of yield changes within each subsample, which is uniformly higher for hawkish than for dovish months (for example,

0.198 versus 0.173 at the 10-year maturity, and 0.188 versus 0.142 at the 2-year maturity), and by inspecting the individual hawkish observations directly: hawkish surprises prior to the January 2020 structural break identified in Section 6.4 produced inconsistent, and in a majority of cases negative, yield responses, whereas hawkish surprises from 2022 onward — March, June, and September 2022, and June 2023 among them — produced large, consistently positive responses. The pooled hawkish coefficient, spanning both an unreliable earlier regime and a strong later regime, consequently fails to reach significance despite the size of its most recent constituent observations. Dovish shocks, whose relationship with Australian yields is more stable across the sample, retain significance despite smaller average magnitudes. This finding is best read not as a standalone directional asymmetry, but as a further manifestation of the regime instability documented in Section 6.3 and Section 6.4.

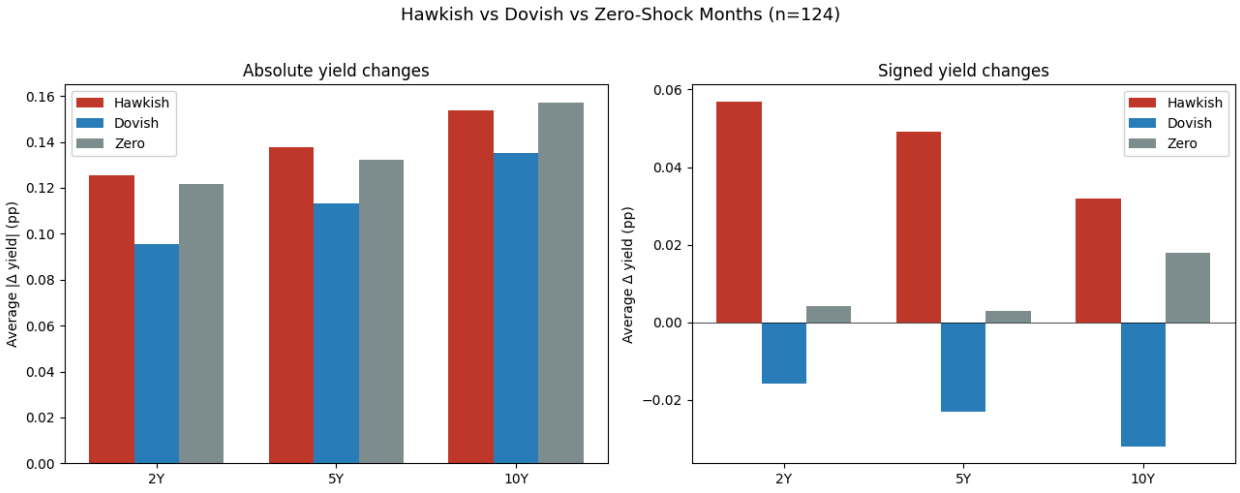


Fig 5

Note: The left panel shows the average absolute yield change by shock direction; the right panel shows the average signed yield change. Hawkish months produce the largest average absolute moves at every maturity (left panel), yet the formal regression in Table 11 shows the opposite pattern for statistical reliability: dovish shocks are significant at every maturity, while hawkish shocks are not. This is not a contradiction between the two panels, but a reflection of within-group consistency rather than average size: hawkish surprises prior to the structural break identified in Table 9 (around January 2020) produced inconsistent, often negative, yield responses, while post-break hawkish surprises (e.g. March and September 2022) produced large, consistently positive responses. Pooling both regimes into a single

hawkish estimate mixes a strong recent signal with an unreliable earlier one, lowering statistical significance despite the larger average magnitude shown here. Dovish shocks display a more stable relationship across the full sample and consequently retain significance in Table 11 despite smaller average moves. The right panel's signed averages are directionally consistent with this: hawkish months average positive, dovish months average negative, and zero-shock months average small and near zero, as expected.

6.7 Mediation via the U.S. 10-year yield

Table 12 reports the mediation exercise described in Section 4.6, decomposing the total estimated effect of the Jarociński-Karadi shock into a component operating through the U.S. 10-year Treasury yield and a residual direct component.

Table 12. Mediation Analysis: Transmission via U.S. 10-Year Yield

Maturity	δ (GS10→ AGS)	Indirect Effect (γ×δ)	Direct β	Share Explained
ΔAGS 2Y	0.3410	0.7608	1.4684	51.8%
ΔAGS 5Y	0.4144	0.9245	1.5827	58.4%
ΔAGS 10Y	0.5111	1.1404	1.4493	78.7%

Notes: A substantial share of the JK shock's effect on AGS yields — rising from 52% at the 2-year maturity to 79% at the 10-year maturity — is consistent with transmission via the global benchmark-yield (US 10-year Treasury) channel, rather than a direct, maturity-independent effect. This share increasing with maturity is consistent with a term-premium/global-yield-chasing mechanism dominating at longer horizons, while short-end yields are relatively more influenced by direct policy-expectations effects.

The Jarociński-Karadi shock is found to move the U.S. 10-year yield significantly (γ = 2.22, p = 0.001) and the U.S. 10-year yield is, in turn, significantly associated with the AGS yield at every maturity (Table 6). Combining these two estimates, the implied indirect effect accounts for an estimated 52 per cent of the total effect at the 2-year maturity, rising to 58 per cent at the 5-year maturity and 79 per cent at the 10-year maturity. The share of the total effect attributable to this channel rising with maturity is consistent with a global benchmark-yield or portfolio-rebalancing mechanism playing a proportionally larger role at longer maturities, where term-premium considerations are more prominent, while shorter maturities remain relatively more exposed to a direct policy-expectations channel. This pattern is consistent with the broader finding that global yield factors explain a substantial share of country-level yield curve dynamics, with their influence varying systematically across the curve (Diebold, Li and Yue, 2008), and it mirrors the cross-country finding of Kearns, Schrimpf and Xia (2023), who document that interest rate spillovers from major central banks are considerably more pronounced at the longer end of the yield curve across a panel of 47 economies, even as countries retain nominal policy rate independence.

6.8 Non-resident holdings

Table 13 reports descriptive statistics for non-resident holdings of AGS, and Table 14 reports the results of regressing the quarterly change in non-resident holdings on the quarterly-aggregated Jarociński-Karadi shock, both contemporaneously and with a one-quarter lag.

Table 13. Track 2 — Non-Resident AGS Holdings (Quarterly, Descriptive)

Variable	Obs	Mean	Median	Std.dev.	Min	Max	Skewness	Kurtosis
Non-Resident Holdings (AUD bn)	53	343.578	351.006	75.560	196.433	468.971	-0.201	1.981
Total AGS Outstanding (AUD bn)	53	661.472	642.521	214.836	285.686	922.068	-0.233	1.572
Proportion Held by Non-Residents	53	0.5429	0.5458	0.0781	0.4425	0.6876	0.491	1.940

Notes: Quarterly observations, 2013:Q1–2026:Q1 (53 quarters). Non-resident holdings grew from roughly $196bn to a peak near $469bn over the sample, broadly tracking the growth in total AGS outstanding (from $286bn to $922bn) as Australia's public debt expanded. The proportion of AGS held by non-residents has remained relatively stable, fluctuating between 44% and 69% of the total, with a sample mean of 54%.

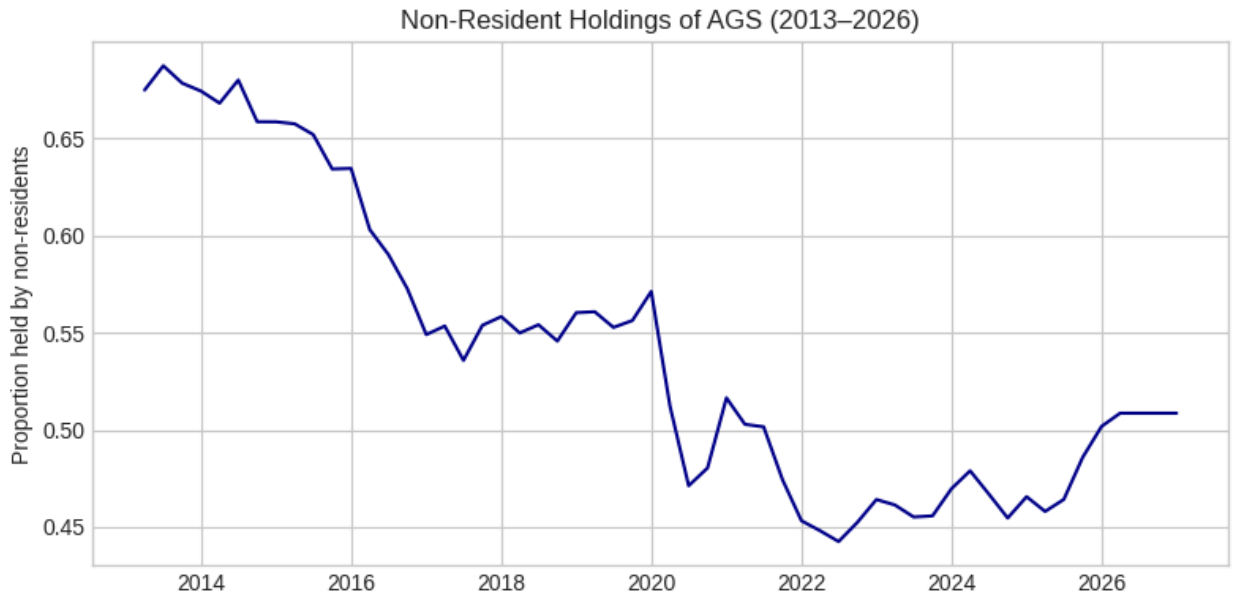


Fig 6.

Note: The y-axis shows the share of total Australian Government Securities (AGS) outstanding held by non-resident investors, expressed as a proportion. A value of 0.45 means 45 % of the total stock of AGS is held by non-residents; a value of 0.65 means 65 %. The series is quarterly (March-quarter to March-quarter) from 2013 Q1 to 2026 Q1. Non-resident holdings peaked around 68–69 % in the mid-2010s and declined to approximately 51 % by early 2026. Source: AOFM, derived from ABS Balance of Payments and International Investment Position data.



Fig 7[5].

Note: This figure overlays the proportion of AGS held by non-residents (right axis) with the U.S. 10-year Treasury yield and the AGS 10-year yield (left axis, both quarterly-aggregated using end-of-quarter values). Periods of rising yields — most visibly the sharp increase from 2022 onward — broadly coincide with a lower non-resident holdings share relative to the 2013–2019 period, consistent with the portfolio-rebalancing channel discussed in Section 6.7. The 2020 dip is a further point of co-movement, with both yields and the holdings share falling sharply around the same time. The holdings share also exhibits a broad downward trend across the full sample, from approximately 68 per cent in 2013 to a range mostly between 45 and 50 per cent from 2020 onward, plausibly reflecting the structural growth in

[5] Simple correlation coefficients over the corrected quarterly sample (n = 45, 2013:Q1–2024:Q1): non-resident holdings proportion with AGS 10-year yield, r = 0.207; with U.S. 10-year yield, r = –0.136.

total AGS issuance outstripping foreign investor demand over the same period (Table 13); the co-movement described above should accordingly be read as layered on top of this longer trend, not as the trend's sole explanation. In the corrected quarterly sample, the correlation between the non-resident holdings share and the AGS 10-year yield is weakly positive (0.21), while the correlation with the U.S. 10-year yield is moderately negative (−0.14), consistent with non-resident holdings responding more to the relative attractiveness of U.S. assets than to conditions in the Australian bond market directly, in line with the global portfolio-rebalancing channel discussed in Section 6.

Table 14. Track 2 — Foreign Holdings Regression (Quarterly, Descriptive)

Specification	β (jk_shock_q)	SE	p-value
Same-quarter	-23.1904	12.978	0.072
Lagged (next quarter)	-4.0448	9.6021	0.6736

Notes: Neither the same-quarter nor the lagged specification reaches conventional statistical significance, though the same-quarter estimate (p = 0.072) approaches the 0.05 threshold. The coefficient sign is directionally consistent with the theorized channel (a hawkish shock associated with a reduction in non-resident holdings), but the relationship should not be interpreted causally. This is plausibly attributable to quarterly aggregation masking offsetting within-quarter capital flows, as anticipated at the design stage of this analysis

Given the concentration of the main yield effect in the post-2020 period (Sections 6.3–6.4), we re-estimate the lagged specification restricted to the post-2020 period alone (n = 25 quarters). The coefficient rises substantially in magnitude, to -20.35, more than three times larger than the full-sample estimate, though it remains statistically insignificant (p = 0.31) — plausibly reflecting the limited statistical power available from only 25 post-2020 quarterly observations, rather than the absence of a genuine relationship.

Given the caveats discussed in Section 3.4 regarding the aggregate, quarterly nature of the holdings data, which plausibly obscures offsetting capital flows occurring within a given quarter, this result is reported as suggestive rather than conclusive, and should not be interpreted as evidence against a portfolio-rebalancing channel so much as evidence that the available data cannot resolve the question with confidence.

7. Discussion

The results presented in Sections 5 and 6 support a clear central finding: an unanticipated change in U.S. monetary policy, isolated using the high-frequency identification approach of Jarociński and Karadi (2020), produces a statistically reliable and economically meaningful increase in the yield on Australian Government Securities, and by direct implication in the cost of servicing Commonwealth debt. This effect is not a mechanical consequence of the U.S. policy rate itself, which shows no significant relationship with Australian yields once separated from its surprise component, but arises specifically from the market's reassessment of the expected path of U.S. policy at the moment that reassessment occurs. The finding is consistent with, and adds a precisely identified Australian data point to, the broader literature documenting that U.S. monetary policy operates as a global rather than a purely domestic force (Rey, 2013; Miranda-Agrippino and Rey, 2020; Kearns, Schrimpf and Xia, 2023).

Three features of the results merit further discussion. The first concerns timing. The effect of a Jarociński-Karadi shock on Australian yields is concentrated almost entirely within the month of the announcement and the month following it, with no evidence of a persistent or slow-building response thereafter. This is a reassuring rather than a troubling feature of the result: it is what one would expect if Australian bond markets process the implications of a U.S. policy surprise efficiently, rather than adjusting only gradually as the news diffuses. It also implies that the debt-servicing consequences of a given U.S. policy surprise are realised quickly, rather than accumulating slowly over subsequent months, a point of some relevance for the operational side of Australian debt management.

The second concerns the instability of the effect over time. The pooled, full-sample coefficient conceals a marked difference between the pre-2020 and post-2020 periods: the estimated effect is statistically indistinguishable from zero before 2020, and becomes considerably larger and more reliable thereafter, a pattern confirmed formally by the structural break test in Section 6.4 and further illuminated by the hawkish-dovish asymmetry result in Section 6.6. One plausible reading of this pattern is that the transmission of U.S. monetary policy surprises to Australian yields is itself state-dependent, becoming most pronounced during periods in which policy surprises are large, directionally unambiguous, and embedded in a broader narrative of sustained tightening — conditions that describe the 2022–2023 hiking cycle considerably better than they describe the more gradual, better-telegraphed policy adjustments of the preceding decade. This reading is consistent with the broader finding in the international capital flows literature that extreme, wave-like episodes of cross-border flows are associated primarily with global risk factors rather than with steady-state conditions (Forbes and Warnock, 2012), suggesting that the strength of cross-border transmission more generally may be episodic rather than constant. An alternative, less structural reading is simply that a small number of unusually large post-2020 surprises dominate the pooled estimate, and that a longer post-2020 sample would be needed to establish whether the stronger relationship persists as a general feature of the current policy environment or reflects the particular characteristics of this one tightening episode. The present sample does not allow these two readings to be fully distinguished, and we regard this as an open question rather than one this paper resolves.

The third concerns mechanism. The finding that a substantial and maturity-increasing share of the total effect is consistent with transmission via the U.S. 10-year Treasury yield (Section 6.7) suggests that the channel connecting U.S. policy surprises to Australian borrowing costs is not confined to a narrow, mechanical repricing of near-term policy expectations, but extends to a broader global benchmark-yield or portfolio-rebalancing channel of the kind emphasised by Miranda-Agrippino and Rey (2020), operating more strongly at longer maturities where term-premium considerations are more salient. This is corroborated, albeit only suggestively, by the secondary

analysis of non-resident AGS holdings in Section 6.8, whose coefficient moves in the theoretically expected direction without reaching statistical significance at the quarterly frequency available. We regard this as a data limitation rather than as evidence against the channel itself: a quarterly aggregate is poorly suited to detecting capital flows that may partially reverse within the same quarter, a point noted in advance of estimation and consistent with the broader finding in the sovereign-debt-holdings literature that portfolio flows and yields are typically jointly and rapidly determined (Arslanalp and Tsuda, 2014).

These findings carry a practical implication that is worth stating plainly. If a material share of the variation in Australian government borrowing costs originates in surprises to U.S. monetary policy, particularly during periods of sustained global tightening, then Australian debt management and fiscal planning cannot treat the cost of government borrowing as a purely domestic variable, however sound domestic monetary and fiscal policy may be. This does not imply that Australian policy is powerless over its own financing conditions — the significant, if smaller, role of the domestic cash rate documented in Section 5.1, and the broader finding in Morley and Wong (2025) that local shocks retain independent importance in determining Australia's neutral interest rate, both indicate that domestic conditions matter in their own right — but it does suggest that a meaningful portion of the volatility in Australian borrowing costs should be expected to originate offshore, and that this exposure appears to have intensified in the period since 2020. Conditional on the post-2020 relationship estimated in this paper persisting, a monetary policy surprise of a magnitude comparable to, or exceeding, the largest observed in our sample would be expected to produce a proportionally larger increase in Australian government yields than in the pre-2020 period — a risk exposure to which Australian debt management should remain attentive. This exposure is compounded by the mechanics of how Commonwealth debt is actually issued. The Australian Office of Financial Management conducts bond tenders on an approximately weekly basis throughout the year, with issuance continuing on this regular schedule even through periods of significant market volatility, such as the 2022 sell-off driven by expectations of more aggressive monetary tightening (AOFM, 2022). Because a

substantial share of issuance proceeds on this regular schedule rather than being deferred to calmer periods, a period of elevated yields following a U.S. policy surprise mechanically raises the average cost of that period's new and refinanced borrowing.

Several limitations of this paper should be acknowledged. The sample, while covering more than ten years of monthly data, contains a comparatively small number of genuinely large policy surprises, particularly in the post-2020 subsample on which the paper's most striking findings rest; conclusions about the post-2020 regime should accordingly be treated as suggestive of a pattern rather than as a precisely estimated regime parameter. The secondary analyses of the transmission mechanism and of non-resident holdings are, by design, descriptive rather than causally identified, and should be read as consistent with, rather than as independent proof of, the mechanisms they are intended to illustrate. The mediation exercise in particular rests on a first-stage relationship between the Jarociński-Karadi shock and the U.S. 10-year yield that, while highly significant, explains only a modest share of that yield's total variation; the estimated mediation shares should accordingly be read as indicative of a plausible channel rather than as a precisely bounded decomposition.Finally, this paper does not extend its claims beyond the yield and borrowing-cost stage of the transmission chain; whether a rise in Australian government yields of the magnitude documented here has material consequences for the broader Australian economy is a distinct question, and one on which recent Australian evidence on adjacent transmission channels (Elias, Gillitzer, Kaplan, La Cava and Prasad, 2025) suggests caution against assuming a mechanical or uniform pass-through.

8. Conclusion

This paper set out to answer a single, narrowly defined question: does an unanticipated change in U.S. monetary policy raise the yield on Australian Government Securities, and by implication the cost of Australian government borrowing? Using the high-frequency shock series of Jarociński and Karadi (2020) as an identifying

instrument, and Local Projections to trace its dynamic effect, we find that the answer is yes. A Jarociński-Karadi monetary policy surprise produces an immediate, statistically significant increase in AGS yields across the 2-, 5-, and 10-year maturities, an effect that is realised within approximately one month and does not persist meaningfully beyond it.

This average finding, however, is not the whole story, and we have been careful throughout not to present it as such. The effect is markedly stronger and more reliable in the period since 2020 than before it, a pattern confirmed by a formal structural break test and further illuminated by an examination of individual hawkish and dovish policy surprises across the sample. A substantial and maturity-increasing share of the total effect appears consistent with transmission via co-movement in the U.S. 10-year Treasury yield, pointing toward a global benchmark-yield channel operating alongside, and at longer maturities perhaps dominating, the more direct policy-expectations channel that the identification strategy is designed to isolate — a finding that should be read as indicative given the modest explanatory power of the underlying first-stage relationship, rather than as a precisely bounded decomposition. A secondary, descriptive analysis of non-resident holdings of AGS moves in the direction this mechanism would predict without reaching statistical significance, a result we attribute to the coarseness of the quarterly data available rather than treating it as evidence against the channel.

Taken together, these findings indicate that the cost of Australian government borrowing is not fully insulated from decisions taken by the Federal Reserve, and that this exposure appears to have grown more pronounced in the period since 2020. For a country whose monetary policy is set independently by the Reserve Bank of Australia, this is a reminder that financial openness carries a cost in the form of imported volatility, even where it delivers well-understood benefits in the form of deep and liquid capital markets. Future work, particularly once a longer post-2020 sample becomes available, could usefully test whether the stronger transmission documented here persists as a durable feature of the current global monetary environment, or whether it instead

reflects the particular characteristics of a single, unusually synchronised global tightening cycle.

References.

Arslanalp, S. and Tsuda, T. (2014). "Tracking Global Demand for Advanced Economy Sovereign Debt." IMF Economic Review, 62(3), 430-464.

Bernanke, B. S. and Kuttner, K. N. (2005). "What Explains the Stock Market's Reaction to Federal Reserve Policy?" Journal of Finance, 60(3), 1221-1257.

Bruno, V. and Shin, H. S. (2015). "Cross-Border Banking and Global Liquidity." Review of Economic Studies, 82(2), 535-564.

Chow, G. C. (1960). "Tests of Equality Between Sets of Coefficients in Two Linear Regressions." Econometrica, 28(3), 591-605.

Dickey, D. A. and Fuller, W. A. (1979). "Distribution of the Estimators for Autoregressive Time Series with a Unit Root." Journal of the American Statistical Association, 74(366), 427-431.

Diebold, F. X., Li, C. and Yue, V. Z. (2008). "Global Yield Curve Dynamics and Interactions: A Dynamic Nelson-Siegel Approach." Journal of Econometrics, 146(2), 351-363.

Ehrmann, M. and Fratzscher, M. (2009). "Global Financial Transmission of Monetary Policy Shocks." Oxford Bulletin of Economics and Statistics, 71(6), 739-759.

Elias, M., Gillitzer, C., Kaplan, G., La Cava, G. and Prasad, N. (2025). "The Mortgage Debt Channel of Monetary Policy when Mortgages are Liquid." Working paper.

Forbes, K. J. and Warnock, F. E. (2012). "Capital Flow Waves: Surges, Stops, Flight, and Retrenchment." Journal of International Economics, 88(2), 235-251.

Gertler, M. and Karadi, P. (2015). "Monetary Policy Surprises, Credit Costs, and Economic Activity." American Economic Journal: Macroeconomics, 7(1), 44-76.

Gürkaynak, R. S., Sack, B. and Swanson, E. (2005). "Do Actions Speak Louder Than Words? The Response of Asset Prices to Monetary Policy Actions and Statements." International Journal of Central Banking, 1(1), 55-93.

Jarociński, M. and Karadi, P. (2020). "Deconstructing Monetary Policy Surprises—The Role of Information Shocks." American Economic Journal: Macroeconomics, 12(2), 1-43.

Jordà, Ò. (2005). "Estimation and Inference of Impulse Responses by Local Projections." American Economic Review, 95(1), 161-182.

Kearns, J., Schrimpf, A. and Xia, F. D. (2019). "Explaining Monetary Spillovers: The Matrix Reloaded." RBA Research Discussion Paper No. rdp2019-03, Reserve Bank of Australia.

Kearns, J., Schrimpf, A. and Xia, F. D. (2023). "Explaining Monetary Spillovers: The Matrix Reloaded." Journal of Money, Credit and Banking, 55(6), 1535-1568.

Kuttner, K. N. (2001). "Monetary Policy Surprises and Interest Rates: Evidence from the Fed Funds Futures Market." Journal of Monetary Economics, 47(3), 523-544.

Kwiatkowski, D., Phillips, P. C. B., Schmidt, P. and Shin, Y. (1992). "Testing the Null Hypothesis of Stationarity against the Alternative of a Unit Root." Journal of Econometrics, 54(1-3), 159-178.

Miranda-Agrippino, S. and Rey, H. (2020). "U.S. Monetary Policy and the Global Financial Cycle." Review of Economic Studies, 87(6), 2754-2776.

Morley, J. and Wong, B. (2025). "How Important is Global r-star for Open Economies?" European Economic Review (forthcoming).

Nakamura, E. and Steinsson, J. (2018). "High-Frequency Identification of Monetary Non-Neutrality: The Information Effect." Quarterly Journal of Economics, 133(3), 1283-1330.

Newey, W. K. and West, K. D. (1987). "A Simple, Positive Semi-Definite, Heteroskedasticity and Autocorrelation Consistent Covariance Matrix." Econometrica, 55(3), 703-708.

Obstfeld, M. (2015). "Trilemmas and Trade-offs: Living with Financial Globalization." BIS Working Papers No. 480, Bank for International Settlements.

Ramey, V. A. (2016). "Macroeconomic Shocks and Their Propagation." In Handbook of Macroeconomics, Vol. 2, 71-162.

Rey, H. (2013). "Dilemma not Trilemma: The Global Financial Cycle and Monetary Policy Independence." NBER Working Paper No. 21162.

Stock, J. H. and Watson, M. W. (2018). "Identification and Estimation of Dynamic Causal Effects in Macroeconomics Using External Instruments." The Economic Journal, 128(610), 917-948.

Wu, J. C. and Xia, F. D. (2016). "Measuring the Macroeconomic Impact of Monetary Policy at the Zero Lower Bound." Journal of Money, Credit and Banking, 48(2-3), 253-291.

Data Sources

Australian Government Securities yields — Reserve Bank of Australia, Table F2.1
Series: "Capital Market Yields – Government Bonds – Monthly." Maturities used: 2-year, 5-year, 10-year (3-year, and Australian Government Indexed Bond series available in the same table but not used; see Section 3.1). Publishing institution: Reserve Bank of Australia, Statistics Department. Construction: RBA's own assessed closing-yield methodology, applied consistently from 2013 onward; this supersedes an earlier, methodologically distinct interpolation-based series (the pre-2013 Table F2) which is not spliced into this series for reasons discussed in Section 3.1. Frequency: monthly. Full series availability: 2-year and 5-year from September 2013; 10-year from earlier. Data

availability: 2013:M5–2026:M6; regression sample truncated to 2013:M10–2024:M01; Units: per cent per annum. Access: rba.gov.au/statistics/tables , historical file f02hist.xlsx. Data retrieved: 26/07/2026.

RBA Cash Rate Target — Reserve Bank of Australia, Table F1.1

Series: "Interest Rates and Yields – Money Market – Monthly." Publishing institution: Reserve Bank of Australia. Construction: monthly aggregation of the daily Cash Rate Target, which is set by the RBA Board at scheduled monetary policy meetings and held constant between meetings. Frequency: monthly. Data availability: 2013:M1–2026:M6; regression sample truncated to 2013:M10–2024:M01.Units: per cent per annum. Access: rba.gov.au/statistics/tables , historical file f01hist.xlsx. Data retrieved: 26/07/2026.

Monetary policy shock series — Jarociński and Karadi (2020), maintained data release

Series: monthly-aggregated combined shock (shocks_fed_jk_m.csv), used as the primary input for all main regression tables (Tables 4 through 12, covering the baseline OLS/HAC, Local Projections, and all robustness checks), and per-meeting raw surprises (shocks_fed_jk_t.csv), used for two auxiliary purposes — aggregating to quarterly frequency for the Track 2 non-resident holdings analysis (Tables 13–14), and extracting the individual hawkish-month observations for the reconciliation reported in Section 6.6 — alongside pure-policy and central-bank-information sub-components (both taken from the monthly-aggregated file). Author/maintainer: Marek Jarociński. Construction: high-frequency (narrow announcement-window) surprises in short-term interest rate futures and equity prices around FOMC announcements, decomposed following the methodology of Jarociński and Karadi (2020); monthly aggregation sums all surprises within a calendar month, with non-meeting months assigned zero. Frequency: per-meeting (raw) and monthly (aggregated). Full series availability:

1988–2024. Sample used: 2013:M1–2024:M01; Units: percentage points. Access: github.com/marekjarocinski/jkshocks_update_fed_202401. Data retrieved: 27/07/2026.

U.S. effective Federal Funds Rate — Federal Reserve Economic Data (FRED), series FEDFUNDS

Publishing institution: Board of Governors of the Federal Reserve System, distributed via the Federal Reserve Bank of St. Louis. Frequency: monthly. Data availability: 1954:–2026:M7; regression sample truncated to 2013:M10–2024:M01. Units: per cent per annum. Access: fred.stlouisfed.org/series/FEDFUNDS. Data retrieved: 27/07/2026.

U.S. 10-year Treasury Constant Maturity Rate — Federal Reserve Economic Data (FRED), series DGS10

Publishing institution: Board of Governors of the Federal Reserve System, distributed via the Federal Reserve Bank of St. Louis. Frequency: daily, aggregated to monthly for this paper by taking the end-of-month observation. Data availability: 1962:M1–2026:M7; regression sample truncated to 2013:M10–2024:M01. Units: per cent per annum. Access: fred.stlouisfed.org/series/DGS10. Data retrieved: 27/07/2026.

Shadow federal funds rate — Wu and Xia (2016), maintained data release

Author/maintainer: Jing Cynthia Wu. Construction: term-structure-based estimate of the notional policy rate during periods constrained by the zero lower bound, following the methodology of Wu and Xia (2016). Frequency: monthly. Full series availability: 1990:M1–2023:M6. Sample used: applied only during zero-lower-bound sub-periods within 2013:M5–2024:M01 (approximately 2013–2015 and 2020–2022); the effective Federal Funds Rate is used elsewhere. Units: per cent per annum. Access: sites.google.com/view/jingcynthiawu/shadow-rates. Data retrieved: 27/07/2026.

Non-resident holdings of Australian Government Securities — Australian Office of Financial Management
Publishing institution: Australian Office of Financial Management, compiled from Australian Bureau of Statistics Balance of Payments and International Investment Position data. Series used: level of non-resident AGS holdings and total AGS outstanding, both in AUD billions; proportion held by non-residents constructed as their ratio. Frequency: quarterly. Data availability: 2013:Q1–2026:Q1 (53 quarters); regression sample truncated to 2013:Q1–2024:Q1. Units: AUD billions (levels); per cent (constructed proportion). Access: aofm.gov.au. Data retrieved: 27/07/2026.

Australian Office of Financial Management (2022) — Annual Report
Series: Annual Report 2021-22, Part 1: Review by the Chief Executive Officer.
Publishing institution: Australian Office of Financial Management. Access: transparency.gov.au. Used to support the discussion in Section 7 regarding AOFM's regular weekly issuance schedule continuing through periods of market volatility.

Code and Data Availability.

The complete code used to produce every table, figure, and statistical result presented in this paper is publicly available at https://github.com/Ahmadmangal/U.S.-monetary-policy--AGS-Yields-/blob/main/Australian_Bonds%20(1).ipynb, provided as a single Jupyter notebook covering the full analytical pipeline. The notebook includes: data cleaning and merging across the paper's two-track structure (monthly and quarterly); construction of descriptive statistics (Table 1, Table 13); unit root and stationarity testing (Table 2); heteroskedasticity and serial correlation diagnostics justifying the paper's use of Newey-West HAC standard

errors (Table 3); the baseline OLS/HAC specification and Local Projections estimation (Tables 4 and 5); and the full battery of robustness checks reported in Section 6, including the alternative shock measures (Table 6), the decomposition of the Jarociński-Karadi shock into its pure policy and information sub-components (Table 7), the pre-COVID, post-COVID, and 2022–2023 tightening-cycle subsample splits (Table 8), the Chow structural break test (Table 9), the placebo test and its post-2020-restricted extension (Table 10), the hawkish-dovish asymmetry analysis (Table 11), the mediation exercise decomposing the transmission channel via the U.S. 10-year Treasury yield (Table 12), and the secondary Track 2 analysis of non-resident AGS holdings (Tables 13 and 14). All results reported in this paper, including every coefficient, standard error, and p-value, are directly reproducible from this notebook given the input data described in the Data Sources section above.

All underlying data used in this paper are drawn exclusively from publicly available, primary sources; no proprietary or restricted-access data are used at any stage of the analysis. Where a data source is subject to periodic revision by its publishing institution — as is the case for the Reserve Bank of Australia's historical statistical tables and the Australian Office of Financial Management's non-resident holdings series — the exact retrieval date is recorded alongside each source in the Data Sources section, so that any subsequent revision to the underlying series can be identified and accounted for by researchers seeking to replicate or extend this work. The high-frequency monetary policy shock series of Jarociński and Karadi (2020) and the shadow federal funds rate series of Wu and Xia (2016) are drawn directly from the original authors' own maintained public releases, ensuring full consistency with the source methodology rather than reliance on a secondary or derived version of either series.

The full analysis, from data ingestion through to final table and figure generation, was independently verified through a complete end-to-end re-run of the notebook prior to submission, confirming that every reported coefficient is exactly reproducible from the published code and publicly available source data.

Users wishing to reproduce the results should register for a free API key at the FRED website (fred.stlouisfed.org) and replace the key shown in the notebook with their own wherever it appears.