

## *Discussion*

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### **1. Andrew Stone**

This paper by Mark Crosby and Philip Bodman focuses primarily on links between the Australian and United States business cycles. However, in so doing it aims to shed light more generally on the factors which might account for either actual correlation between the business cycles of different economies or the mistaken impression of correlation where, in fact, little exists.

The paper advances three main theses, drawn from a study of the Australian and US economies as far back as 1870. The first is that two of the popular channels for explaining the degree of co-movement between economies, trade and structural similarity, would seem to be of little help in accounting for the extent of correlation between Australia and the US, or how this has changed over time. On this issue, Crosby and Bodman contribute interesting new evidence through their examination of the period from the aftermath of the Civil War in the US to the start of World War II.

The paper's second main thesis is that caution should be exercised before reading too much into the strong increase since the early 1970s in the 10-year rolling correlation between Australian and US real GDP growth rates (see Figure 5 of the paper). Crosby and Bodman argue that much of this increase, as well as its high absolute level during the 1980s and 1990s, was driven by the common experience of sharp recessions in the early to mid 1970s, the early 1980s and the early 1990s – and thus may not reflect strong intrinsic coupling between the two economies. Rather, it could reflect a handful of episodes of economic downturn which merely happened to coincide despite being the result of independent shocks or policy actions in each country.

Finally, further developing this latter theme, Crosby and Bodman advance tight monetary policy in both the US and Australia as a key cause of the co-incident recessions experienced by both countries in the early 1980s and 1990s. Given that they see little reason for monetary policy in the two countries to move closely in tandem in the future, they therefore predict that the 1980s and 1990s will turn out to represent the high-water mark in the correlation between the Australian and US economies.

To anticipate what follows, I have considerable sympathy with each of these theses, and believe that Crosby and Bodman focus our attention on several of the key aspects of the apparent correlation between the Australian and US business cycles. However, there are also some caveats I would add to each of their theses, which I'll discuss briefly in turn.

### **The roles of trade and structural similarity**

As I mentioned, Crosby and Bodman's first thesis concerns the importance of trade and industrial similarity in explaining the degree of co-movement between economies. Here, their chief contribution, and for me the most interesting part of

their paper, is their use of an extended period of pre-WWII data to study this issue – covering nine countries, but with a particular focus on Australia, the US and the United Kingdom.

While acknowledging the limitations of the information available, the authors provide data suggesting a fair degree of structural similarity between the Australian and US economies in 1870. Both had large agricultural and mining sectors at that time and were heavily reliant on the UK as an export destination, with these exports concentrated in a small number of important (albeit different) goods. Nevertheless, the Australian and US business cycles do not appear to have been particularly synchronised during any part of the period 1870–1939, save during the 1890s and 1930s depressions; nor was the Australian economy much correlated with that of the UK during the decades from 1870 to 1930, despite remaining reasonably open and highly dependent on the UK for its exports (and capital) throughout this whole period.

These observations certainly argue for caution in attributing too much importance to trade linkages or structural similarities in driving co-movement between economies. However, there are two points of qualification which I think may be worth mentioning here.

The first is that the persistently low Australia–UK business cycle correlation may simply illustrate how the trade channel can actually cut both ways. While Australia’s ongoing dependence on the UK as an export destination would have made her economy sensitive to the UK business cycle throughout this period, the extreme specialisation of her exports – with wool alone accounting for between one- and two-thirds of total exports to the UK – would have made her far more subject to the vagaries of idiosyncratic shocks such as drought and disease, and so less likely simply to co-move with the UK.

The second point is that, noting Sir Douglas Copeland’s advice that ‘if a figure looks wrong it probably is’, I would go so far as to say that I simply don’t believe the NBER-based US recession dates which Crosby and Bodman invoke to augment their evidence of asynchronicity between Australia and the US over the period 1870 to 1930.<sup>1</sup> For example, it scarcely seems plausible that the US economy could have been in recession for at least part of no fewer than 7 of the 10 years 1920–1929, the decade known colloquially in the US as the ‘roaring twenties’! More generally, it seems hard to credit that the US economy could truly have spent around 45 per cent of the whole period from 1870 to 1939 in recession, when Maddison (1995) records the US as having achieved real per capita growth from 1870 to 1913 (over at least the first two-thirds of this period) at an average rate that was faster than that of any of 12 comparable western European countries, and double that of Australia.<sup>2</sup>

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1. Whether this reflects inadequacies in the available data from this era, however, or other issues regarding the application of the NBER’s methodology to an economy with the structure and dynamics of the US pre-WWII, I would not venture to guess.

2. Maddison also records US population growth as having been faster over this same period than in any of these 12 comparable western European countries – indeed, more than twice as rapid as in 9 of them – and only slightly slower than in Australia (Table A-2, p 62).

## Recessions and business cycle correlations

Let me now turn to Crosby and Bodman's second main thesis, which is that impressions of strong co-movement between economies can be driven by the co-incident experience of recessions on only a small subset of any given sample. Crosby and Bodman provide strong evidence that this has indeed been the case for Australia and the US since the 1970s, which raises the possibility that the recent high correlation between their business cycles may not reflect any intrinsic linkage between the two economies. A word of caution, however, would seem to be warranted here.

Certainly, it is possible that two countries whose business cycles display little intrinsic co-movement could be made to appear more closely linked than they actually are by coincidentally experiencing one or more common recessions. In this case, re-computing the correlation between the two countries' business cycles with these joint recessions removed – as the authors do – would give a more accurate impression of the true, low degree of co-movement between them.

However, it could equally be that two countries whose business cycles are strongly correlated might find this correlation masked during normal times by statistical noise – especially where a measure such as GDP growth is used as the cyclical indicator for each country. In this case, it would precisely be recessions, where the 'signal-to-noise' ratio is high, in which the true degree of co-movement between the two economies would be revealed – so that excising these from the sample would be the last thing one would want to do.<sup>3</sup>

Hence, Crosby and Bodman's observation that much of the recent high correlation between the Australian and US business cycles has been driven by a small number of recessionary episodes, while noteworthy, does not necessarily undermine the notion of a strong degree of co-movement between the two economies. To settle this

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3. This phenomenon can be thought of as a variant of the usual 'errors in variables' problem in econometrics. To see this, imagine a situation in which the true business cycles of two countries,  $\tilde{y}_t^A$  and  $\tilde{y}_t^B$ , are perfectly correlated but are measured with error (with the measurement errors in each country assumed, for simplicity, to be orthogonal to each other and to the two countries' common true cycle). In this case we would have that

$$\begin{aligned}\tilde{y}_t^B &= \alpha \tilde{y}_t^A \\ y_t^A &= \tilde{y}_t^A + \varepsilon_t \\ y_t^B &= \tilde{y}_t^B + \xi_t\end{aligned}$$

where  $y_t^A$  and  $y_t^B$  denote the measured business cycles of countries *A* and *B* respectively. A simple calculation then yields that the observed cycles of the two countries would show a correlation

$$\text{corr}(y_t^A, y_t^B) = 1 / \sqrt{\left[1 + \frac{\text{var}(\xi_t)}{\text{var}(\tilde{y}_t^B)}\right] \left[1 + \frac{\text{var}(\varepsilon_t)}{\text{var}(\tilde{y}_t^A)}\right]}$$

which is strictly less than the true value of 1. Moreover, for given scales of measurement error in each country's cycle, this formula shows that the degree of bias of this measured correlation from its true value will be greater the smaller are the variances of the true cycles,  $\tilde{y}_t^A$  and  $\tilde{y}_t^B$ , of the two countries. Hence, this bias would be exacerbated if periods of high volatility in the true business cycles of the two countries, such as joint recessions, are excised from the sample.

would seem to require detailed study of each episode to identify the factors driving recession in each country. As it happens, this naturally leads us to the authors' final main thesis and the issue of policy synchronisation.

## **Policy synchronisation**

In the latter part of their paper, Crosby and Bodman argue that

... the Australian economy has been synchronised with the US and other economies in the post-war period mainly through synchronisation of monetary policy in the early 1980s and early 1990s, and the oil shock that affected global economies in the early 1970s. (p 251)

They then argue that this suggests that the Australian economy is not intrinsically closely linked to that of the US, and so will not need to sneeze if the US catches a cold in the future. Once again, I believe that there may be a fair degree of truth to this latter conjecture. However, I think that two objections could be raised to their line of reasoning.

The first is that, if one is to focus on monetary policy as a cause of co-movement, there is a potential endogeneity issue to be addressed. After all, monetary policy itself is likely to be highly dependent on the current or expected future state of a country's business cycle.

To be fair, one might expect this endogeneity to tend to reduce the correlation between any two economies, all other things equal, as independent monetary policy-makers in each country attempt to minimise their own nation's output volatility – including that potentially induced by developments in the other economy. Hence, the observation that synchronised tight monetary policy in two countries had contributed to increased output volatility in each, and hence a higher correlation between their GDP growth rates, could still be noteworthy.

Nevertheless, it would still beg the question: why was monetary policy synchronised in the two countries, contributing to simultaneous recessions in each, and to what degree might this be the result of strong linkages between the two? For example, consider a situation where Economy A moves very strongly in line with Economy B, so that monetary policy in the former could be expected to closely mirror that in the latter. Were an inflationary boom to occur in Economy B, this would then be expected to spread to Economy A, possibly requiring monetary policy in both countries to be used to engineer slowdowns designed to bring inflation back under control. In this case, each country's co-incident experience of a slowdown stemming from synchronised tight monetary policy would be the result of a strong degree of co-movement between the economies, rather than an episode to be discounted on the grounds that both slowdowns were policy-driven.

The second objection, which naturally follows from the preceding discussion, relates to whether Crosby and Bodman are in any case right to fix so strongly on monetary policy as the explanation for the recessions of the early 1980s and 1990s in both the US and Australia. Important as monetary policy is, I cannot help but think that there were other significant factors at work in generating each of these

recessions – and that consideration of these additional factors might, in fact, help to strengthen Crosby and Bodman’s thesis of limited intrinsic linkage between the Australian and US economies.

For example, two added factors besides monetary policy which immediately spring to mind as contributing to Australia’s deep recession from late 1981 to mid 1983 are the very severe drought of the early 1980s, and the direct impact of the so-called ‘second wages explosion’ in 1981 (as opposed to its indirect impact in causing the increase in real interest rates which Crosby and Bodman focus on). The former saw farm GDP fall by around 23 per cent in 1982–83, subtracting around 1 percentage point from overall GDP growth in that year. The latter saw average earnings increase by 13.3 per cent in 1980–81 and by 13.8 per cent in 1981–82, at a time when median inflation was averaging only just over 9 per cent per annum over the two years.<sup>4</sup>

As it happens, these two added factors were clearly idiosyncratic to Australia. Acknowledging a role for them would actually lend weight to Crosby and Bodman’s thesis of limited intrinsic linkage between Australia and the US despite their joint experience of recession at that time – unless, of course, one were prepared to argue that it was the downturn in Australia which dragged the US economy into recession!

That said, to truly settle this question would require a careful analysis of the degree to which Australia’s growth co-moved with that of the US in the early 1980s or early 1990s, after suitably abstracting from all such idiosyncratic factors. Such a detailed historical analysis would, I believe, both potentially bolster Crosby and Bodman’s thesis of likely limited future co-movement between the business cycles of Australia and the US, as well as represent a nice counterpoint to the valuable pre-WWII historical evidence presented by them in the first half of their paper.

## Reference

Maddison A (1995), *Monitoring the world economy, 1820–1992*, OECD Development Centre, Washington DC.

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4. As an aside, the ‘first wages explosion’ in Australia occurred in 1973. This saw Australia’s Conciliation and Arbitration Commission – an official body which at the time set wages for much of the workforce under Australia’s highly centralised wage-setting system – award a 17.5 per cent increase in minimum wages at a time when consumer price inflation, although rising, was running at an annual rate of less than 6 per cent. This presumably also contributed significantly to Australia experiencing a recession shortly thereafter, rather than this recession being entirely the result of the (admittedly dramatic) first OPEC oil shock of the March quarter 1974.

## 2. General Discussion

The authors' assertion that similar monetary policies have played an important role in creating recessions, and thus in driving business cycle synchronicity, was contested by several participants. One participant argued that the most recent recession in the US was precisely an example of an insufficient tightening of monetary policy ultimately contributing to a recession, while another participant noted that the close linkage between US and Australian business cycles is econometrically robust to controls for monetary policy. Moreover, one participant expressed concern at drawing implications from the figure of rolling correlations between Australian and US interest rates (Figure 9), given the possibility these may be distorted by known outliers. Similarly, a couple of participants highlighted the role that wars have played in increasing synchronicity, arguing that these episodes should perhaps be treated differently from other periods.

In contrast to Crosby and Bodman's suggestion that monetary policy synchronisation may be a phenomenon of the past, a few participants thought that monetary policy might remain synchronised in the future. One participant pointed to recent experience in Asia, where loose monetary policy by the US Federal Reserve has had a substantial effect on bond and credit markets in the region, and argued that portfolio rebalancing effects are likely to promote similarities in monetary and financial conditions going forward. Other participants highlighted the role that structural reforms, especially relating to monetary policy, had in the 1980s and 1990s in driving business cycle synchronicity, and suggested that growth in capital and financial market linkages may also be important factors underpinning correlations in the future. And another participant built on the discussant's comments by questioning how monetary policy could be similar between countries with flexible exchange rates unless each country is facing a similar business cycle.

The quality of pre-war data was also a consistent theme of comments from participants. There was some question about the robustness of the paper's results to the use of an alternative data source constructed by Haig<sup>1</sup>, which, when compared with the Maddison data used by the authors, tends to shift growth into different periods. A second participant suggested that the NBER dating methodology was not applied consistently prior to the 1960s, and that the earlier cycles are more representative of growth cycles than classical cycles. In contrast, though, a third participant argued that the large number of recessions in the US during the 1920s was not inconsistent with its characterisation as the 'roaring 20s', as the amplitude of expansions was substantially larger than the amplitude of contractions during that period.

The nature of the transmission mechanisms in the early part of the paper's sample was also questioned. In particular, it was noted that trade and financial linkages were likely to operate more slowly in the pre-war era, so that it is perhaps unsurprising that the correlation between these countries is not as high as it is

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1. Haig B (2001), 'New estimates of Australian GDP, 1861–1948/49', *Australian Economic History Review*, 41, pp 1–34.

currently. In response to this, Mark Crosby noted that lagging one country's cycle does not qualitatively alter the authors' finding that correlations were substantially weaker in the pre-war period.

Finally, one participant questioned the appropriateness of excluding recessions, arguing that it is natural for economies to be growing, and that the joint occurrence of recessions is therefore a notable event. Mark Crosby agreed with this comment, but echoing points raised in the discussion of previous sessions, he noted that his findings imply that research should focus on what causes these recessions.