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**Renminbi trade invoicing: Benefits,
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KATHLEEN WALSH

This paper analyses a survey of Australian and Chinese corporates on renminbi (RMB) invoicing awareness, use and expectations. It considers the benefits of RMB trade invoicing as well as a range of factors that would appear to be discouraging its use in trade between Australia and China. It also identifies potential tipping points for increased RMB invoicing going forward.

FROM THE

Managing Editor

KEVIN DAVIS SF Fin, Professor of Finance, University of Melbourne
Research Director, Australian Centre for Financial Studies and Professor of Finance, Monash University

The papers in this issue of *JASSA* address a range of highly topical issues affecting equities markets, as well the prospects for increased renminbi trade invoicing and for a reduction of Australia's headline company tax rate, which is particularly relevant in view of the taxation reform White Paper process currently underway in Australia.

First, James Murray examines the impact of changes in financial regulations which took effect in April 2014 to allow equity crowdfunding and peer-to-peer (P2P) lending in New Zealand. The main change which makes financial crowdfunding viable is exempting issuers from producing prospectuses and investment statements when making a regulated offer through an equity crowdfunding platform or P2P lender. Murray notes that over the following year, one P2P lender and five equity platforms gained licences, and 16 companies also launched equity crowdfunding campaigns raising over \$6m. He indicates that although this represents a very small share of New Zealand's financial market, financial crowdfunding could become part of the mainstream financial services industry if similar growth patterns to those experienced internationally were to occur in New Zealand.

Geoffrey Kingston then tackles the thorny issue of whether Australia's company tax rate could be cut substantially with little or no loss of tax revenue if abolishing dividend imputation were used to finance this. Kingston indicates that recent OECD data offer limited support for this proposition. Also, while his estimates are broadly consistent with Treasury-type analysis suggesting that the headline company tax rate could be cut to 20 per cent, Kingston notes that this type of exercise relies on debateable assumptions, and imputation mitigates other idiosyncrasies of our tax system. He suggests that abolition of imputation should await a cut in the top marginal personal tax rate along with a transition to back-end taxation of most superannuation accounts.

The paper by Clive Gaunt shows that while studies continue to report an exceptionally strong and persistent small firm premium over time within the Australian market, in practice, there is no exploitable small firm premium in Australian stock returns. Gaunt's analysis suggests that the appearance of this premium is dependent on the inclusion of highly illiquid, low price stocks which previous research has shown can bias returns. He notes that this premium entirely disappears when these stocks are excluded from the sample and, if a small firm premium does exist, for all practical purposes it cannot be exploited.

Next, Duc Man Nguyen and Chee Seng Cheong examine the relationship between the Australian Implied Volatility Index (A-VIX) and its underlying asset, the S&P/ASX 200 Index. They highlight the fact that the availability of A-VIX futures, which were introduced in October 2013, has opened the door for investors who want to explore the index as a possible way to provide portfolio protection. But the authors argue that A-VIX futures do not offer the same diversification benefit as their underlying index, and could potentially weaken investment performance if included. They argue that the volume and liquidity of A-VIX futures have not yet reached levels comparable to those of other actively traded derivatives, but that there is potential for developing more tradeable instruments based on the A-VIX similar to the exchange-traded products on volatility indices that are available in the US and Europe markets.

In the final paper in this issue, Kathleen Walsh analyses a survey of Australian and Chinese corporates on renminbi (RMB) invoicing awareness, use and expectations. The paper considers the benefits of RMB trade invoicing as well as a range of factors that would appear to be discouraging its use in trade between Australia and China, and also identifies potential tipping points for increased RMB invoicing going forward. Walsh notes that one of the most striking results of the survey is that both Australian and Chinese corporates are waiting for the other to initiate a change, suggesting a 'waiting game' where each firm is waiting for the trading partner to take the lead in the use of RMB invoicing. Overall, she suggests that the survey findings seem to indicate that increased RMB trade invoicing and settlement in the future will require greater awareness in China, especially in relation to the costs of hedging in a high-volatility market.

I would like to thank all of our contributors for their very interesting and valuable insights, and I look forward to many more excellent contributions to *JASSA* throughout the year.

EQUITY CROWDFUNDING AND PEER-TO-PEER LENDING IN NEW ZEALAND:

The first year

JAMES MURRAY, Senior Lecturer, Department of Business, Christchurch Polytechnic Institute of Technology

Equity crowdfunding and peer-to-peer (P2P) lending in New Zealand is authorised under the Financial Markets Conduct Act 2013 (FMCA) with the relevant sections taking effect from 1 April 2014. Over the following year, one P2P lender and five equity platforms gained licences, and 16 companies also launched equity crowdfunding campaigns raising over \$6m.¹ While this represents a tiny fraction of New Zealand's financial market, financial crowdfunding has grown rapidly in overseas markets (Baeck et al. 2014) and it would become part of the mainstream financial services industry if similar growth were to occur in New Zealand.

Types of crowdfunding

Crowdfunding is designed to raise funds through small contributions from a large number of individuals (the crowd). While modern internet and communications technology makes it easy for individuals and companies to contact people directly, in practice, the use of intermediary crowdfunding platforms can be more efficient in providing a central marketplace. Furthermore in New Zealand the FMCA stipulates that financial crowdfunding must take place through a registered platform.

There are four types of crowdfunding: donation, reward, lending and equity. *Donation campaigns* seek funds for charitable and social projects. Funds are provided with no expectation of financial or material returns. *Reward campaigns* seek funds to support a personal or small business project. This can include businesses raising funds to create new products or services, which are provided to supporters as a non-financial reward. Reward crowdfunding is not subject to any special laws or regulations but when projects involve the pre-sale of goods or services they are subject to existing laws and regulations affecting sales and credit transactions. The main focus of this paper is financial crowdfunding through *peer-to-peer (P2P) lending and equity crowdfunding*. P2P lending services link borrowers to lenders, equity crowdfunding links companies to new shareholders, and as both facilitate investment activities they are subject to financial regulation in New Zealand.

Crowdfunding regulations

New Zealand's securities laws are based on the idea that issuers need to disclose sufficient information for public investors to make informed investment decisions (Griffiths 2013). However, this can be a barrier to small businesses raising funds as the costs of producing a prospectus and committing to ongoing disclosure are high relative to the amount raised. Internationally, equity crowdfunding exists where the securities laws allow exemptions, or where laws have been changed to allow crowdfunding. For example, in Australia, specific crowdfunding rules are yet to be introduced; under existing securities laws equity crowdfunding is restricted to qualified investors and a limited number of the general public, resulting in a somewhat smaller crowd.²

While it was theoretically possible to undertake that type of private-equity crowdfunding in New Zealand before the FMCA took effect, it was costly and risky to do so. Issuers making a private offer could provide less disclosure, but if that offer was mistakenly made to one member of the public then the entire offer was deemed to be an offer to the public and therefore void in the absence of a registered prospectus and investment statement. Similarly P2P lending was not possible in New Zealand before the FMCA, as the broad wording of the *Securities Act 1978* classified P2P loans as public offers.³

Regulatory changes were made to authorise financial crowdfunding following the introduction of the *Financial Markets Conduct Act 2013*. The FMCA replaces most existing financial legislation, including the *Securities Act 1978*, which covered the primary issue of securities, and the *Securities Markets Act 1988*, which covered secondary trading (Griffiths 2013). The key change that makes financial crowdfunding viable is exempting issuers from producing prospectuses and investment statements⁴ when making a regulated offer through an equity crowdfunding platform or P2P lender. These changes are not simply a relaxation of financial regulations but reflect a trade-off between different forms of regulation. Reduced disclosure recognises that standard financial disclosures by new and high-growth companies have little value, so they have been replaced by mandatory use of licensed crowdfunding platforms and a \$2m limit on the amount that can be raised.

The key change that makes financial crowdfunding viable is exempting issuers from producing prospectuses and investment statements when making a regulated offer through an equity crowdfunding platform or P2P lender. These changes are not simply a relaxation of financial regulations but reflect a trade-off between different forms of regulation.

P2P lending

P2P lending has some superficial similarities to banking in that the crowdfunding platform is an intermediary seeking funds from investors for borrowers. However, P2P lending platforms differ from banks in that they do not take deposits and do not provide asset transformation or maturity transformation. Instead the platform acts as a broker between borrower and investor. It is important for investors to understand that although these are registered financial service providers, P2P platforms are not registered banks and cannot provide the same safeguards that banks provide to depositors.

Unlike banks, P2P platforms let lenders choose who borrows their money, allowing them to select higher risk, higher expected return investments. Harmony, New Zealand's first (and currently only) licensed P2P lending platform, assesses each borrower's credit risk and allocates a risk grade from A1 to F5. Each grade corresponds to a fixed interest rate, from 9.99 per cent for A1 borrowers to 39.99 per cent for F5.⁵ Lenders are informed about each borrower's general demographic profile, risk grade and intended use of funds. Lenders using 'Manual Invest' select which borrowers they want to lend to and allocate funds in \$25 multiples. Lenders using 'Quick Invest' can specify their risk-return preference and Harmony will allocate funds to borrowers on their behalf. P2P platforms benefit borrowers who either cannot borrow from conventional lenders or would be charged higher rates (Hollas 2013). While both consumer and business P2P lending is found in other countries, Harmony in New Zealand only serves resident personal borrowers. Personal borrowers may seek funds for business purposes but Harmony's \$35,000 loan limit means it is unlikely to provide much benefit to any but the smallest businesses.

The P2P market is still in its initial growth phase with new providers looking to enter and develop the market.⁶ There is demand for mortgage finance in the \$100,000 to \$499,999 range (HorizonPoll 2015). Although it is unlikely that many investors will be willing to invest for the full term of a conventional mortgage bridging loan, for home owners purchasing a new house (but have not yet sold their existing house) this sort of loan could interest P2P lenders.

Potential new entrants to the consumer P2P lending market will be competing with Harmoney (which has first-mover advantage), but could compete by targeting a different market sector or by providing different features. For example, Harmoney's model involves setting interest rates according to the borrower's risk profile, but rejection rates are very high. United States P2P lender Prosper has until recently used an auction approach to set interest rates. The auction approach allows greater flexibility in setting the interest rate and therefore increase the chances of the loan being funded, although it is likely to produce higher-cost loans than when P2P lenders use set interest rates (Chen et al. 2014).

As at April 2015, there were no licenced P2P lending platforms providing business loans in New Zealand. Possible new entrants to this market could come from: consumer P2P lenders moving into business loans; equity platforms adding a P2P service; or from a stand-alone provider. Harmoney's CEO has stated that they are more likely to move into the mortgage market than business lending (Vaughan 2015). For now it appears the most likely development is for an equity platform to add P2P lending. In the United Kingdom Crowdcube offers both equity crowdfunding and P2P business loans and their New Zealand operation may choose to follow this format. Also, My Angel Loan Limited has announced their intention to register as a P2P platform for business loans (My Angel Loans 2015).⁷

As at April 2015, there were no licenced P2P lending platforms providing business loans in New Zealand. Possible new entrants to this market could come from: consumer P2P lenders moving into business loans; equity platforms adding a P2P service; or from a stand-alone provider.

Equity crowdfunding

Investing in companies through equity crowdfunding is risky, as there is no secondary market for shares⁸ and valuations for growing companies is speculative. Funds could be wasted through poor management or wealth expropriated through future share issues at less than fair value (Cumming and Sofia 2013). On the other hand, equity crowdfunding is not just about financial returns. A common feature of equity offers is the inclusion of non-financial benefits, similar to those used in rewards campaigns. For example, The Patriarch Investment Company, raising partial funding for a film, offered a range of rewards across seven different investment levels. Rewards included copies of the script, visits to the film set and an invitation to the opening night. However, the list of their top 20 shareholders (Companies Office 2015) shows nobody invested the \$100,000 required for an associate producer credit on the film.

One of the non-financial benefits of equity crowdfunding for companies is that it provides an opportunity for greater interaction with stakeholders by making it easier for them to become shareholders. This can enhance business ties with suppliers, make customers stronger brand ambassadors and can appeal to people wanting to support local businesses (Cortese 2011). Potentially, companies with strong consumer bases also have a ready-made crowd who can be approached for funding.

With a \$2m funding limit, New Zealand's equity crowdfunding market provides small- and medium-sized enterprises with an alternative to fundraising from venture capital and angel investors but it will not compete with the stock exchange's main board for large capital raisings. While the relationship between the equity crowdfunding market and the exchange's new NXT market remains to be seen, crowdfunding can complement the NXT rather than compete with it.⁹ It is interesting to note that three of the companies seeking equity crowdfunding have post-money valuations of around \$10m as the NXT is aiming for companies with market capitalisations of between \$10m and \$100m.

Another feature of some issues (11 of the 16 offers) is the use of non-voting shares. Non-voting shares help the company avoid the provisions of the Takeovers Code.¹⁰ Code companies face restrictions on any transaction involving shareholders owning more than 20 per cent of the company, so avoiding the code is logical for small companies where most of the shares are still closely held. However, investors buying non-voting shares are placing a high level of trust in the founding shareholders acting ethically. The code's application to small business is under review, so the sale of non-voting shares may become unnecessary.

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The platforms

In the year to April 2015 New Zealand licenced five equity crowdfunding platforms, see Table 1. The Snowball Effect Limited and Pledgeme Limited were the first equity platforms to be licensed and they have also been the most active. The Snowball Effect was the first to launch a campaign and, in the year to April 2015, had the largest number of completed campaigns and raised the most equity.

Pledgeme is an established donation and reward crowdfunding platform which added equity crowdfunding. Its history in project crowdfunding gives it an established presence and crowd that the other platforms do not have. However, that is not necessarily an advantage as Pledgeme will need to find the right balance between the different forms of crowdfunding. It is possible that the introduction of equity crowdfunding will undermine rewards crowdfunding as people who had previously funded rewards campaigns may start to withhold funding unless offered an investment stake (Cholakova and Clarysse 2015). By offering both, Pledgeme is hedging the risk that rewards crowdfunding loses market share.

Equitise Limited is the only other platform to launch an equity campaign in the first year. Equitise is an Australian company which is also planning to offer public equity crowdfunding services in Australia when regulations allow it. My Angel Investment Limited also plans to operate on both sides of the Tasman. However, for now, both companies are only offering services in New Zealand. Crowdfarm Limited (operating as Crowdcube) is a joint venture between Crowdcube Limited and Armillary Private Capital. Crowdcube operates an established equity crowdfunding platform in the United Kingdom. Armillary is an established New Zealand investment services provider and is behind the Unlisted share trading platform. So, although the equity platforms are currently prohibited from offering secondary trading, Crowdcube can offer this through an associated company.¹¹

TABLE 1: New Zealand's equity crowdfunding financial service providers

Platform	Authorisation Date	Campaigns (as at 31 March 2014)			
		Successful	Unsuccessful	Ongoing	Total
Pledgeme	30 July 2014	2	2	5	9
Snowball Effect	30 July 2014	5	0	1	6
Crowdcube	4 November 2014	0	0	0	0
Equitise	22 December 2014	0	0	1	1
My Angel Investment	16 March 2015	0	0	0	0
		7	2	7	16

Sources: <http://www.fma.govt.nz/>, <http://www.business.govt.nz/fsp> and company websites.

Comparison of The Snowball Effect and Pledgeme platforms shows they are serving distinct market segments. Statistics reported in Table 2 show companies using The Snowball Effect are larger, more established and seek larger amounts; however, the relative size of the ownership stake offered shows no significant difference between the two groups.

TABLE 2: Comparison of Snowball and Pledgeme campaigns¹²

	Pledgeme	Snowball	
	Mean value	Mean value	t-statistic
Offer period (days)	36.33	35.20	0.1504
Minimum funding target	\$174,333	\$520,000	4.7578**
Maximum overfunding cap	\$441,029	\$1,280,000	2.5439*
Minimum ownership offered	9.33%	7.14%	0.7746
Maximum ownership offered	19.15%	15.01%	0.9521
Pre-money valuation	\$2,247,859	\$6,723,678	3.0243*
Company age (days)	761.44	2135.60	2.2707*
Sample size	9	5	

Sources: www.snowballeffect.co.nz, www.pledgeme.co.nz, and offer documentation.

*,** significant at the 5% and 1% level, respectively.

The campaigns

There have been some notable milestones and variations on the standard equity crowdfunding model that deserve mention. The first campaign, by Renaissance Brewing Limited, reached its upper limit of \$700,000 in around 10 days, around one-third of the time allocated. Pledgeme has hosted the fastest campaign with Yeastie Boys Limited, a craft brewer, raising \$500,000 in half an hour following an active social media campaign and investor information sessions to promote the offer. Pledgeme also raised \$100,000 for itself within 24 hours. Breathe Easy Limited raised private equity funds before launching its campaign, which helped establish the market value and set the share price. It also meant most of the required funding was already in place and the crowdfunded component is mainly a bonus. Finally, the largest equity campaign, successfully reaching the \$2m limit, was undertaken by Invivo Wines New Zealand Limited. This was the first campaign also offered through sharebrokers before the online offer, resulting in pledges of over \$770,000 already in place at the start of the online campaign (The Snowball Effect 2015).

As the market grows, competition between competing campaigns will increase. So far, the Snowball Effect has largely managed to avoid running simultaneous campaigns, although its campaigns have overlapped with those from Pledgeme and Equitise.¹³ Pledgeme has experienced many overlapping campaigns, from their first two launching on the same day to an apparent rush at the end of the financial year resulting in five simultaneous offers on the one platform. Whether overlapping offers are beneficial or problematic remains to be seen. If they are competing for limited investor funds then there is a problem, but they could benefit from increased investor attention as each company brings its own crowd to the crowdfunding platform.

Opportunities for future research

So far there have been too few campaigns, and too few failed campaigns, to statistically analyse the determinants of success. However, some possible influences can be identified, such as behavioural factors. For example, the two failed campaigns are notable for having the highest share prices. While a strict rational perspective would suggest there is no difference between buying 500 x \$1 shares and one x \$500 share, we should not be surprised if people were more likely to see the latter offer as more expensive, especially in a market where \$1 share prices are common in initial public offers.

So far there have been too few campaigns, and too few failed campaigns, to statistically analyse the determinants of success. However, some possible influences can be identified, such as behavioural factors. For example, the two failed campaigns are notable for having the highest share prices.

Behavioural factors could also help explain the sequence and timing of pledges. If less sophisticated investors receive signals of offer quality from prior investors then cascade effects (where large pledges to a campaign make subsequent investments more likely and more rapid) should be observable. Success may also reflect conventional and social media activity raising awareness of the platforms and campaigns. Finally, with the absence of prospectuses and investment statements the quality and usefulness of information provided to investors should be examined.

Notes

1. All dollar amounts in this paper are expressed in New Zealand Dollar terms.
2. To distinguish between crowdfunding restricted to accredited investors and crowdfunding open to all investors the former is referred to as private-equity crowdfunding and the latter as public-equity crowdfunding.
3. Nexx New Zealand Limited has been trying to introduce a P2P lending service since 2007, but was not able to do this because the Securities Act disclosure provisions prevented the development of a low-cost model.
4. There is also no requirement for crowdfunding issuers to provide the new product disclosure statements, which are allowed under the FMCA from 1 December 2014.
5. Borrowers are also charged a platform fee of from 2 to 6 per cent of the loan amount. Late payment or default will lead to dishonour fees, and overdue and legal fees.
6. Possible new entrants include Lendme (lendme.co.nz) and Squirrel Money (squirrelmoney.co.nz).
7. My Angel Loan Limited is associated with licenced equity crowdfunding platform My Angel Investment Limited, having the same owners and directors.
8. Licencing conditions expressly prohibit equity crowdfunding platforms from providing secondary trading facilities, however, private sales by negotiation are possible.
9. The NXT market is also designed as a low-cost market for small- to medium-sized enterprises. Under the FMCA companies can raise funds without producing a full prospectus and, unlike the main board (NZX) and alternative market (NZAX), companies will provide periodic disclosure instead of continuous disclosure.
10. The Takeovers Code applies to companies with more than 50 shareholders with voting rights and more than 50 share parcels.
11. Unlisted's future viability is uncertain as under the FMCA it requires registration which will increase its compliance costs. It is currently seeking exemptions which would allow its compliance costs to remain low.
12. Data excludes The Patriarch Investment Company Limited, as this was a special purpose vehicle created immediately prior to its campaign and offering 100 per cent ownership, its data is an outlier in half of the variables examined in Table 2.
13. The Snowball Effect's first two campaigns would have overlapped if the first had not finished early; their campaigns for Invivo Wines and Breathe Easy did overlap.

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DIVIDEND IMPUTATION OR *low company tax?*

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Recent OECD data offer limited support for the proposition that Australia's company tax rate could be cut substantially with little or no loss of tax revenue. Treasury-type analysis suggests otherwise: the headline rate could be cut to 20 per cent if abolishing dividend imputation were used to finance this. But this type of exercise relies on debateable assumptions, and imputation mitigates other idiosyncrasies of our tax system. Accordingly, abolition of imputation should await a cut in our top marginal personal tax rate along with a transition to back-end taxation of most superannuation accounts.

Australia introduced dividend imputation in 1987. Under this policy, Australian households, superannuation funds and charities receiving franked dividends, i.e. from Australian companies that have paid company tax to the Australian Taxation Office, are reimbursed \$19bn p.a. via the system for taxing individual and superannuation incomes. In 2000 investors became able to claim franking credits even if they paid no tax, and this feature has become popular with self-funded retirees.

Should franking credits for households, superannuation funds and charities be abolished, thereby freeing up \$19bn pa for cutting the headline rate of company tax? It is hard to estimate with any precision the amount by which we could cut the headline rate with little or no loss of tax revenue. Australian Treasury's 2015 *Tax Discussion Paper* floats this policy but does not take a stand on the actual numbers. Building on the framework of *Treasury Working Paper* (Cao et al. 2015) I estimate that the headline tax rate for large companies could be cut from 30 per cent to 20 per cent. But the relevant calculations rely on strong assumptions, for example that Australian companies will not revert to the low payout ratios and high gearing that were widespread before imputation. Moreover, eyeballing a scatterplot of recent OECD data suggests that the new headline rate would be more like 25 per cent. That is, Treasury-type modelling generates more optimistic guesses.¹

The standard analysis of company tax in the small open economy was originated by Sir Donald MacDougall and has been reprised in the *Treasury Working Paper* (Cao et al. 2015). That analysis assumes capital is perfectly mobile internationally, labour is immobile, payout ratios are 100 per cent, corporate borrowing is zero (or unresponsive to tax policy), and the marginal investor resides wholly offshore. Under these conditions the size of the domestic capital stock is driven by the headline company tax rate, and is unaffected by dividend imputation. This is the essence of the case for abolishing dividend imputation and using the proceeds to lower the headline rate.

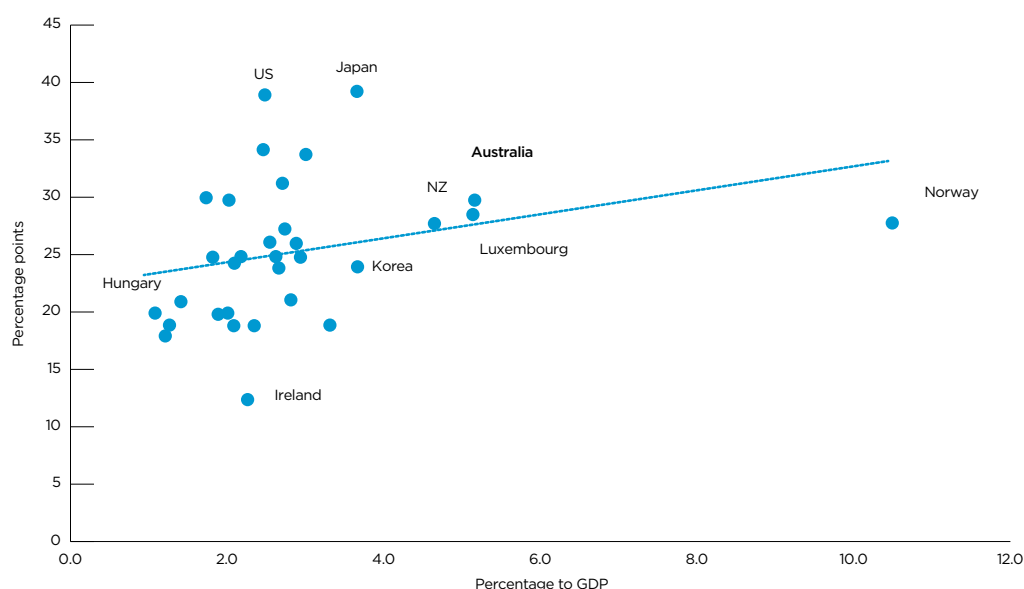
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Yet foreign-controlled entities which cannot access imputation credits can minimise company tax by means of earnings retention, debt finance and transfer pricing, weakened as these strategies are by Australia's capital gains tax, thin-capitalisation rules and withholding taxes on interest and dividend payments offshore. Moreover, there appears to be some leakage offshore of imputation credits: 'An estimated \$12 billion (30 per cent) of the imputation credits distributed each year are received by non-resident shareholders' (*Tax Discussion Paper*, Australian Treasury 2015). And when foreign investors have the option of relocating to Australia, it is not obvious that foreign entities are denied franking credits even in theory. Indeed, Australia's business migration program is expressly designed to attract investor settlers.² In these ways and others, there is ample room for disagreement about the consequences of abolishing dividend imputation.

Revenues versus rates

If business tax revenues and the domestically-located capital stock are both sensitive to the headline company tax rate then OECD data should confirm that. A variant of this hypothesis is that there may be a 'tournament effect' whereby setting an extremely low rate generates a disproportionate rise in revenues and/or the national capital stock. Typically mentioned in this context are Irish rates (12.5 per cent) and Swiss rates (21 per cent.) Thus, back in 2002 Ireland's company tax receipts as a percentage of total tax revenues stood at three quarters of the corresponding Australian percentage even before accounting for the disbursements of franking credits to Australian taxpayers (Kingston 2006). Figure 1 shows the latest available data on corporate tax revenues and rates in the OECD.

FIGURE 1: Revenues versus headline company tax rates OECD, 2012



Source: OECD (2015).

Note: 2012 data for Chile and Mexico were not available. Along with Australia and New Zealand those two countries are the only members of the OECD to have retained full dividend imputation (*Tax Discussion Paper*, Table 5.1).

In 2012 Australia's company tax rate 'neighbours' were New Zealand and Luxembourg. Outliers of the scatterplot were Hungary (lowest revenues) Norway (highest revenues), Ireland (lowest rate) and Japan (highest rate).

Ireland collected more corporate tax revenue as a share of GDP than 12 out of the 31 countries in the sample, even though it does not have dividend imputation. That share stood at 2.3 per cent, compared to 2.5 per cent in the case of the United States, which effectively has partial imputation but a headline company tax rate of 39 per cent. As recently as 2006 Irish corporate tax revenue stood at 3.2 per cent of GDP. The decline between 2006 and 2012 was presumably to do with Ireland's subdued economy in the wake of the global financial crisis.

Likewise, in the OECD as a whole, 2012 offered little sign of a 'tournament effect' whereby setting an ultra-low headline company tax rate generates exceptional revenues. Rather, there was a positive association between revenues and rates, consistent with conventional thinking on public finance.

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Saul Eslake has been reported as saying that abolishing dividend imputation in Australia would enable cutting our headline rate to 25 per cent (Irvine 2015). A relevant data point in Figure 1 is the one for South Korea, which in 2012 collected company taxes worth 3.7 per cent of GDP by means of a headline rate of 24 per cent, along with partial shareholder relief from double taxation (Australian Treasury 2015, Table 5.1). By contrast, Australian company taxes raised 5.2 per cent of GDP. This difference, (5.2 - 3.7 = 1.5 percentage points), is close to the total imputation credits claimed by individuals, superannuation funds and charities, namely 1.3 per cent of Australia's GDP in calendar 2012.³ Thus Figure 1 supports Eslake's estimate.

By contrast, Gruen (2006, pp. 22–3) says that 'an indicative target for the company tax rate if Australia moves back to the classical system' is in the range of 19 to 21 per cent, although 'revenue neutrality might allow the rate to be reduced to still lower levels — perhaps 15 per cent or less'. Gruen cites de Mooij and Ederveen (2006) and others in support of the 15 per cent figure. Following the logic of the *Treasury Working Paper* (Cao et al. 2015), I estimate that our headline corporate tax rate could be cut to 20 per cent (see Appendix). This is broadly consistent with Gruen's numbers.

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Cannavan et al. (2004) find that franking credits had negligible market value following system-tightening measures in 1997. Gruen notes that this result strengthens the case for abolishing dividend imputation. However, Minney (2010, p. 32) finds that 'there has been an increase in the value assigned to franking credits over recent years for stocks in the ASX 300', from 24 per cent of their theoretical value in the period 2001–05, to 53 per cent for 2006–09.

A third way to estimate the new company tax rate after abolition of imputation is simply to scale down the current rate of 30 per cent by the proportionate reduction in revenues once franking credits are no longer distributed to households, superannuation funds and charities. This method gives a new tax rate of $30 \times (65 - 19) / 65$ i.e. 21 per cent, in between the two earlier estimates.

Models

MacDougall (1960), the *Tax Discussion Paper* (Australian Treasury 2015), a speech by a Deputy Secretary of the Treasury (Heferen 2015) and *Treasury Working Paper* (Cao et al. 2015) all highlight a similar diagram showing that cutting the headline company tax rate faced by foreign investors would enlarge the national economy. Figure 2 of the *Treasury Working Paper* explicitly portrays some effects of using franking credits to finance a cut in the headline rate. The *Tax Discussion Paper* and Heferen's speech show 'quantity of investment' (presumably the stock of physical capital) on the horizontal axis and rates of return on the vertical axis. Heferen's speech highlights a triangular area labelled 'economic value lost due to the tax', although it is unclear what this area represents. Moreover, none of the Treasury documents takes a stand on the magnitude of the associated economic impacts. Figure 2 tries to fill some of these gaps.

FIGURE 2: Abolishing dividend imputation

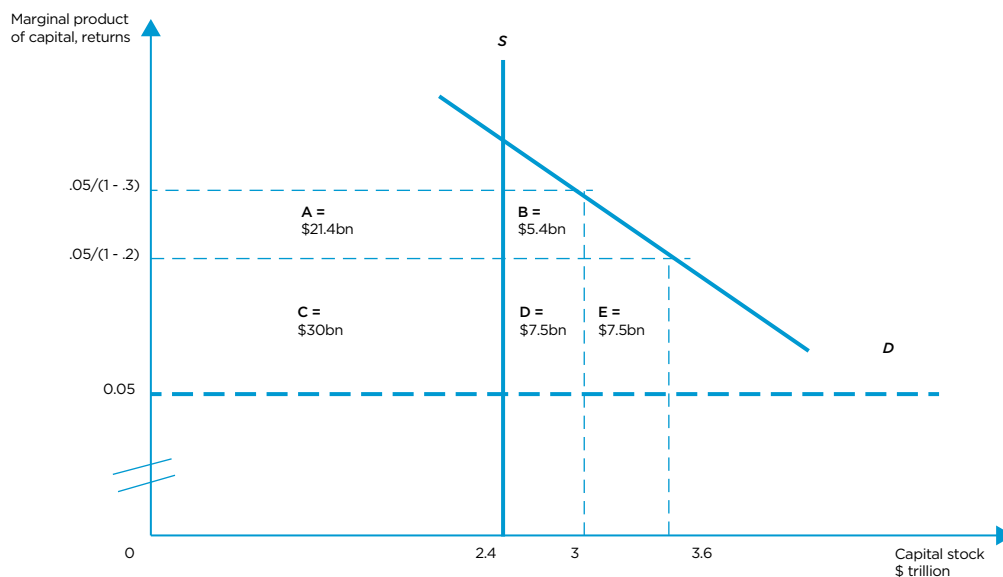


Figure 2 illustrates the Australian economy before and after the \$19bn pa of franking credits claimed by individuals, superannuation funds and charities are used to finance a cut in the headline company tax rate.

The horizontal axis shows the capital stock. The schedule *D* shows the marginal product of Australian-located physical capital. Following Mankiw et al. (1992), the exponent on physical capital in the aggregate production function is one-third (see Appendix). Following the *Treasury Working Paper* (Cao et al. 2015), the schedule *S* shows the supply of capital by Australian residents, and is assumed to be perfectly inelastic, debatable as that assumption is. The Australian-located capital stock initially stands at \$3tn, of which \$2.4tn is Australian owned (Cao et al. 2015).

The vertical axis shows the marginal product of capital located in the Australian economy along with three different rates of return. The heavy dashed line cuts the vertical axis at 0.05, reflecting an assumption that offshore investments are in perfectly elastic supply at a 5 per cent real rate of return (see Appendix). The initial headline company tax rate is 30 per cent, implying that foreign investors require a pre-tax rate of return of $0.05/(1 - 0.3) = 0.071$ per cent p.a. for Australian investments to be considered. The initial return before tax to domestic investors is also 7.1 per cent p.a.

The revenue initially collected from foreign investors is given by $B + D$, i.e. $(3 - 2.4) \times 0.3 \times 0.071 = \12.9 bn p.a. The headline revenue initially collected from domestic investors is $A + C$, i.e. $2.4 \times 0.3 \times 0.071 = \51.4 bn p.a. Total headline revenue is $A + B + C + D$, or \$64.3bn p.a., close to the required \$65bn p.a. I follow the *Treasury Working Paper* (Cao et al. 2015) in assuming 'company income tax revenue from domestically owned capital is largely returned in the form of franking credits'.

Now suppose franking credits to households, superannuation funds and charities are abolished and that the proceeds, namely \$19bn p.a., are applied to cutting the headline rate. Foreign investors now face a headline company tax rate of 20 per cent (see Appendix). Foreign investment booms, driving up the domestically-located capital stock to \$3.6tn. The return before tax to investors is driven down to 6.25 per cent p.a. Revenue collected from foreigners rises by E minus B , i.e. by \$2.1bn p.a. The headline company tax revenue collected from domestic residents falls by A i.e. by \$21.4bn p.a.⁴

Interactions

Part of the case for replacing dividend imputation with a lower headline corporate tax rate is that Australia has fallen out of step with its traditional peer group. Notably, Canada and the United Kingdom have lower headline company tax rates than ours — 26 per cent and 21 per cent, respectively. Canada offers a 'dividend tax credit at shareholder level for underlying domestic corporate profits' (*Tax Discussion Paper*, Australian Treasury 2015, Table 5.1) but appears not to have the cash-refund feature that we have had since 2000. The UK offers some shareholder relief. But full imputation is not the only quirk in our tax system. Also unusual are our highly progressive taxes on personal incomes and our 15 per cent tax on the earnings of superannuation funds in accumulation mode. Imputation helps ameliorate these other idiosyncratic policies.

Swan (2015) points out that abolishing imputation without revising our current personal tax scale would result in very high effective marginal rates on dividend income, especially if the company tax rate were left at 30 per cent. The effective marginal rate on dividend income faced by an individual taxpayer in the 37 per cent tax bracket would then rise to 56 per cent. The effective marginal rate faced by a personal taxpayer in the 47 per cent bracket would rise to 63 per cent, 'comparable to France with the world's highest tax rate on distributions'. Even if the company tax rate were reduced to 20 per cent, the effective marginal rate for someone in the 47 per cent bracket would still be a hefty 58 per cent.

Consider the decision to invest \$1 with the intention of spending the proceeds 30 years hence. Assume that the dollar is invested within the super system, the earnings rate on the fund is 5 per cent p.a., and franking credits negate the earnings tax. Then \$1 compounds to $(1 + .05)^{30} = \$4.32$. By contrast, if the earnings were taxed at 15 per cent then \$1 would compound to $[1 + (1 - .15) \times .05]^{30} = \3.48 . Understanding the power of compound interest, Australian life-cycle savers would contemplate the alternative strategy of building up equity in a geared family home or investment property — dwellings are gearing-friendly and tax-benefit effective. Yet housing is a consumer durable rather than a productive asset.

Most countries in the northern hemisphere do not tax pension fund earnings until the account-holder retires, whereupon super drawdowns are taxed in line with the regular rate scale. Thus, tax on super is essentially a progressive consumption tax. Viewing tax on super in this way, the need recedes for incessant debate about the fairness of tax concessions for super. This policy also encourages voluntary contributions and self-funded retirements.

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Then there are the effects of imputation on debt and equity choices. David Murray's Financial System Inquiry (2014) is one of a number of reports to note that imputation tends to reduce the leverage of Australia's corporate sector, thereby promoting financial stability. Domestic investors reweight towards domestic equities at the expense of foreign equities, and bonds (both domestic and foreign). Home bias is not entirely bad: people do want to 'keep up with the Joneses'. Imputation also discourages the retention of earnings, thereby disciplining corporate managers.

Concluding comments

Treasury's *Tax Discussion Paper* says that dividend imputation 'makes little contribution to attracting foreign investment to Australia' and 'involves a significant cost to revenue'. Treasury appears to be drawn towards abolishing dividend imputation along with cutting the headline rate of company tax.

Treasury's erstwhile Resource Super Profits Tax and its recent modelling of imputation have something in common. Both envisage a fiscal free lunch whereby a tax measure imposes losses on Australian investors without affecting their behaviour, yet generates gains for the economy as a whole. Fleshing out a simple version of the Treasury model, I estimated that abolishing imputation could cut returns before tax to domestic investors from 7.1 per cent p.a. to 6.25 per cent p.a. A perpetuity repriced at this yield would fall in value by 14 per cent – self-funded retirees beware. Yet there could be a rise in national income of 4.9 per cent, assuming that all the proceeds of abolishing imputation are applied to reducing the headline company rate (see Appendix).

Dividend imputation may raise the cost of capital for the marginal investor, but it helps mitigate the other idiosyncrasies of our tax system. Abolishing imputation is a capital-market analogue of abolishing tariffs. Just as freeing up imports should be sequenced after domestic liberalisation, so abolishing dividend imputation should be sequenced towards the back end of comprehensive tax reform. A better way incrementally to promote business investment could be simply to cut the headline rate by small amounts, if and when spending control and the economic outlook permit. In 2011, for example, New Zealand successfully cut its headline rate from 30 per cent to 28 per cent.

Appendix: Estimating the effects of abolishing dividend imputation

Building on the *Treasury Working Paper* (Cao et al. 2015), I estimate the magnitudes associated with abolishing dividend imputation and using the proceeds to cut the company tax rate. Equation (6) of that paper argues foreign investors require the before-tax rate of return to physical capital located within Australia, r_{bt} , to equal the exogenously given global rate of return r_w divided by one minus the company tax rate τ_K :

$$r_{bt} = \frac{r_w}{1 - \tau_K} \quad (1)$$

Assume a Cobb-Douglas aggregate production function $Y_d = cK^{1/3}\bar{H}^{2/3}$, where Y_d is domestic product, c is a constant, K is the Australian-located stock of physical capital, and \bar{H} the fixed stock of labour in Australia (exertion plus human capital). Next, substitute the marginal product of capital for r_{bt} in Equation (1):

$$\frac{c}{3} K^{-2/3} \bar{H}^{2/3} = \frac{r_w}{1 - \tau_K} \quad (2)$$

Hence the link between a change in the company tax rate and the resulting change in the Australian-located capital stock is:

$$\Delta K = -\frac{3}{2} K \left(\frac{\Delta \tau_K}{1 - \tau_K} \right) \quad (3)$$

If the headline company tax rate is initially 30 per cent and the capital stock is initially \$3tn then a cut of 10 percentage points in the headline rate induces an inflow of \$642bn of foreign capital. If a headline \$65bn pa of company tax revenue is initially collected from domestic and foreign investors, then $0.3 \times (r_w/1-0.3) \times 3 = 0.065$, i.e. the model-consistent value of r_w is 5 per cent p.a.

Now reallocate \$19bn of franking credits from domestic households, superannuation funds and charities to paying for a cut in the headline rate. The new capital stock K' and the new tax rate τ'_K must satisfy

$$\frac{0.05}{1 - \tau'_K} \tau'_K K' = 0.065 - 0.019 \quad (4)$$

Use Equation (3) to substitute for K' ($= \Delta K + K$) in (4). This pins down the new tax rate τ'_K ($= \Delta\tau_K + \tau_K$) as a solution of the quadratic equation

$$0.321(\tau'_K)^2 - 0.292\tau'_K + 0.046 = 0. \quad (5)$$

The relevant solution is $\tau'_K = 0.2$ i.e. 20 per cent. It follows from (3) that $K' = \$3.6\text{tn}$.

The change in national welfare following abolition can be measured by the percentage change in national income. In the setup here, national income Y_n is given by domestic product minus the flow of dividends offshore:

$$Y_n = cK^{1/3} \bar{H}^{2/3} - r_w K_f \quad (6)$$

where K_f is the foreign-owned capital stock. It follows that a first-order approximation to the percentage change in national income is:

$$\begin{aligned} \frac{\Delta Y_n}{Y_n} &= \frac{cK^{1/3} \bar{H}^{2/3}}{3Y_n} \frac{\Delta K}{K} - r_w \frac{\Delta K_f}{Y_n} \\ &= \frac{Y_d}{Y_n} \frac{\Delta K}{K} \left(\frac{1}{3} - r_w \frac{K}{Y_d} \right). \end{aligned} \quad (7)$$

Introduce the facts that in calendar 2014 gross national income was \$1.569tn, and gross domestic product was \$1.599tn. This together with earlier information implies that the change in national income following lower company tax and the abolition of imputation is 4.9 per cent.

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Notes

1. The most common argument for retaining dividend imputation is that it counters the 'double taxation' of capital income. But there is much double taxation elsewhere in tax systems that attracts little adverse comment. For example, taxes on corporate and personal incomes in most federations are levied at both the federal and state level, and it is not obvious that this has been a bad thing. So the case for retaining imputation needs to cast a wider net.
2. In fact, MacDougall did consider the case of labour market responses.
3. The raw figure 'in recent years' was 19bn p.a. (Australian Treasury 2015, p. 83). The headline total company tax take was \$65bn p.a.
4. My use of the word 'headline' alludes to the consideration that the setup of Figure 2 does not account for the rise in revenues collected via personal taxes, following abolition. The problem is that the notion of a 'representative recipient' of franked dividends would have to lump together untaxed pensioners with people on the top personal rate.

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THE ILLUSORY AUSTRALIAN *small firm premium*

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Previous research has found that the small firm premium which was prominent in the US and UK markets up until the late 1980s has disappeared from both markets. In contrast, studies continue to report an exceptionally strong and persistent small firm premium over time within the Australian market. However, our analysis finds that in practice there is no exploitable small firm premium in Australian stock returns.

The term 'small firm premium' generally refers to evidence that small firms, on average, produce returns above that of large firms. Previous studies support the existence of a small firm premium by demonstrating a significant difference between the portfolio returns on the smallest decile and largest decile firms by market capitalisation. Fama and French (1993) offer a risk-based story to explain why returns might be related to size.

The small firm premium and the broader size anomaly have been documented in US and UK stock returns. In Australia, early reports of the small firm premium came from Brown et al. (1983) and Beedles et al. (1988). More recent studies include Durand et al. (2007), Gharghori et al. (2009), O'Brien et al. (2010), Bettman et al. (2011), Brailsford et al. (2012), Dou et al. (2013), Docherty et al. (2013), Gray (2014) and Zhong et al. (2014).

While there is some consensus within these studies on the small firm premium, there are also some key differences. First, Dimson and Marsh (1999) document the demise of the small firm premium after the 1980s in the UK, whereas the evidence from the Australian market suggests that this premium persists into the 1990s and the 2000s. Second, portfolio returns on the smallest decile firms in the Australian studies are much larger than those documented overseas.

In contrast with previous work, our study finds little evidence of an exploitable small firm premium within the Australian market. It appears that the existence of a size effect in previous work is due to biases in computed returns and requires the inclusion of illiquid stocks with very low share prices and/or uncertain size at the time of portfolio formation.

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Method and results

Monthly return and market capitalisation data is sourced from the SIRCA share price relative database (SPPR) which comprises all Australian Securities Exchange listed firms from January 1974 to December 2013.

Decile size portfolios are formed once a year, at the end of December (the portfolio formation month), based on the total market value of its equity and then rebalanced each month during the year. Equally weighted buy and hold returns are calculated for each portfolio for each month, then an arithmetic average across time (1973–2013) is computed for each decile portfolio.

Table 1 presents raw returns, descriptive statistics and liquidity statistics for each of the 10 portfolios for this first sample (Sample A). Consistent with previous Australian studies, Panel A reports a marked difference between the mean return to the smallest and the largest decile portfolios. The F values generated by a test of the equality of means across all portfolios (1 to 10) and across the largest and smallest decile portfolios (1 and 10) are statistically significant ($P < 0.0001$).

There is also evidence of an inverse relationship between size and returns across the smallest six portfolios.

TABLE 1: Size portfolios — Sample A

Portfolio	Panel A: Raw return per month			Panel B: Portfolio statistics (Average of all months)							Panel C: Liquidity statistics					
	Mean	Median	Std Dev	No. of Firms	Tot mkt cap (\$m)	% of tot mkt cap	Ave mkt cap (\$m)	Mkt cap (\$m)	Med share price (cents)	% of sub 20 cent stocks	% Not traded on last day of portfolio formation month	Of those in previous column, median days since last trade	% not traded in portfolio formation month	Of those in previous column, median days since last trade	Total December 2012 portfolio trade value (\$m)	Median December 2012 total per stock trade value (\$)
1 (large)	1.09%	1.41%	4.92%	136	613,161	85.17%	3,896.86	1,227.35	389	0.7%	8.61%	13	3.46%	182	63,474.9	112,705,739
2	0.96%	1.33%	5.11%	135	36,231	7.68%	232.98	209.61	193	2.9%	14.84%	7	2.65%	87	3,482.3	7,337,415
3	0.97%	1.04%	4.99%	135	12,535	3.10%	81.30	78.91	131	6.2%	21.72%	7	3.66%	80	595.1	1,681,020
4	0.90%	1.13%	5.42%	135	5,822	1.66%	37.85	36.96	88	15.5%	28.19%	7	5.79%	113	301.7	700,417
5	0.92%	1.15%	5.96%	135	3,125	0.99%	20.46	20.11	61	26.0%	33.99%	8	7.66%	78	110.5	217,541
6	1.29%	1.38%	6.63%	135	1,850	0.61%	12.15	12.04	46	37.5%	37.63%	8	9.88%	101	91.6	121,016
7	1.81%	1.99%	7.49%	135	1,147	0.38%	7.54	7.49	34	50.0%	42.61%	8	12.28%	91	53.1	63,900
8	2.58%	2.10%	8.62%	135	705	0.23%	4.64	4.60	26	60.3%	48.73%	9	15.54%	119	14.7	30,784
9	4.10%	3.24%	9.63%	135	415	0.13%	2.73	2.71	19	67.9%	56.81%	11	21.36%	111	8.2	11,935
10 (small)	8.06%	5.41%	13.86%	135	180	0.05%	1.18	1.24	11	78.7%	69.09%	28	37.69%	189	5.3	2,766

The methodology employed in previous Australian studies and in Table 1 leads to the inclusion of a large number of low share price, illiquid firms that may bias computed returns and produce returns which cannot feasibly be exploited. Blume and Stambaugh (1983) and Bhardwaj and Brooks (1992) document a bias when computing returns for low share price firms.

Panel B of Table 1 provides a range of descriptive statistics which serve to highlight just how small the firms are in the smallest decile portfolios. The smallest decile portfolio comprises just 0.05 per cent of the total market capitalisation, has an average firm market capitalisation of \$1.18m and a median share price of 11 cents. The smallest five size deciles account for just 1.4 per cent of the total market by capitalisation.

Panel C of Table 1 reports several liquidity-related statistics for each portfolio. For the smallest decile portfolio, 37.69 per cent of firms did not trade during the portfolio formation month and 69.09 per cent did not trade on the last day of the portfolio formation month. These non-trading problems are particularly evident across the smaller decile portfolios and this highlights the potential for firms to be allocated to the wrong portfolio and for monthly returns to be computed which are not based on end of month share prices. Panel C also provides data on the dollar value of trades in each of the portfolios created at the end of December 2012. For the smallest decile portfolio, there was a total of \$5.3m traded and a median of \$2,766 per share traded for the month. The firms in this smallest decile, which drives the small firm premium result, are very illiquid.

The analysis above indicates two very real problems with investors aiming to exploit the small firm premium. First, calculated returns may be biased or misleading as a result of the smallest decile portfolio comprising low share price firms and firms that did not trade on the last day of the month or, in many cases, did not trade at all in the month. Second, it may not be feasible to exploit returns due to the highly illiquid nature of the shares comprising the smallest decile portfolio.

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What small firm premium is feasibly available to investors? To address this question, the analysis is re-run with several changes to the portfolio construction and return calculation method (Sample B). Only securities designated as 'Ordinary' are included, ensuring that exotic securities such as unit trusts etc. are not included in the sample. Stocks with a share price less than or equal to 20 cents are excluded in order to minimise a number of market microstructure issues associated with low share price stocks. To avoid bias from non-synchronous trading and ensure stocks are correctly assigned to size portfolios, only stocks which have a price recorded for the last day of the portfolio formation month are included. While annual portfolio formation is retained, the portfolio is rebalanced annually rather than monthly to minimise the bias due to the bid-ask effect. Value weighted rather than equal weighted returns are calculated. Finally, a geometric average return is calculated rather than an arithmetic average, as the arithmetic average inflates the mean return, particularly where returns are volatile, as they are with smaller stocks.

TABLE 2: Size portfolios — Sample B

Portfolio	Panel A: Raw return per month			Panel B: Portfolio statistics (Average of all months)						Panel C: Liquidity statistics		
	Mean	Median	Std Dev	No. of Firms	Tot mkt cap (\$m)	% of tot mkt cap	Ave mkt cap (\$m)	Med mkt cap (\$m)	Med share price (cents)	Total December portfolio trade value (\$m)	Median December total per stock trade value (\$)	
1 (large)	0.96%	1.44%	5.38%	58	322,005	76.21%	5,199.17	2,696.22	561	43,017.2	330,686,210	
2	1.01%	1.37%	5.23%	57	38,936	11.83%	659.04	616.07	299	6,418.0	92,733,939	
3	0.93%	1.41%	5.71%	57	15,630	5.04%	265.13	256.80	217	2,704.2	38,899,288	
4	0.83%	1.31%	5.30%	57	8,272	2.70%	139.59	137.11	163	1,036.7	9,456,027	
5	0.79%	1.40%	5.37%	57	5,017	1.66%	84.37	83.26	127	382.9	4,660,584	
6	0.75%	1.37%	5.91%	57	3,164	1.07%	52.87	52.23	95	181.8	2,162,257	
7	0.59%	0.86%	6.40%	57	2,017	0.69%	33.66	33.57	75	155.2	1,740,714	
8	0.72%	1.29%	6.75%	57	1,264	0.43%	21.03	20.96	60	91.6	923,773	
9	0.97%	0.92%	7.54%	57	750	0.26%	12.38	12.40	49	40.5	375,397	
10 (small)	0.98%	0.99%	7.37%	57	325	0.11%	5.32	5.38	40	13.1	94,821	

Panel B of Table 2 provides portfolio statistics for the revised portfolios. It is clear that the newly imposed sample criteria, particularly the above 20 cent minimum share price, have significantly reduced the sample. However, the smallest decile portfolio clearly still comprises very small firms with an average market capitalisation of \$5.32m versus \$1.18m previously. The smallest portfolio now accounts for 0.11 per cent of total market capitalisation compared with 0.05 per cent and the smallest five decile portfolios make up 2.56 per cent compared with 1.4 per cent previously.

Panel C of Table 2 confirms that the smallest of the revised portfolios are far more liquid than their predecessors. For example, despite the smallest decile portfolio having less than half the number of firms, the total December 2012 value traded was \$13.1m compared to \$5.3m previously, and the median per stock traded value is \$94,821 versus \$2,766.

The absence of any small firm premium is evident in Panel A of Table 2, with average returns to both the smallest and largest decile portfolios very similar, though the smallest decile portfolios still generate more volatile returns than the largest decile portfolios. The F values generated by a test of the equality of means across all portfolios (1 to 10) and across the largest and smallest decile portfolios (1 and 10) are not statistically significant ($P > 0.95$).

It is worth noting that in separate unreported tests the 20 cent price filter, by itself, substantially reduces but does not eliminate the premium of the smallest decile portfolio (2.5 per cent per month) over the largest size portfolio (1 per cent per month). It is the combination of the 20 cent price filter and the other changes outlined above designed to minimise return bias and unobtainable returns, which produce the absence of a small firm premium.

Conclusion

Previous research on Australian stock returns has documented a significant small firm premium. Our analysis indicates that the appearance of this premium is dependent on the inclusion of highly illiquid, low price stocks which previous research has shown can bias returns. This premium entirely disappears when these stocks are excluded from the sample. If a small firm premium does exist, the results here suggest that for all practical purposes it cannot be exploited.

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ENHANCING PORTFOLIO PERFORMANCE WITH

the implied volatility index

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Implied volatility has become a popular asset class as investors seek more effective diversifiers for investment portfolios after the recent global financial crisis. This paper provides a close examination of the relationship between the Australian Implied Volatility Index (A-VIX) and its underlying asset, the S&P/ASX 200 Index. It also highlights the limitations of A-VIX futures, which were introduced in October 2013, as a diversifier for investment portfolios.

Financial markets around the world suffered dramatic declines in market values as a result of the 2007 global financial crisis (GFC). The S&P 500 Index dropped by approximately 50 per cent from its peak in 2008, while the S&P/ASX 200 Index fell from 6700 points to the 3100 points one year after the crisis, according to the Chicago Board of Options Exchange and the Australian Securities Exchange (2012). Many investment funds which were well-diversified¹ and protected still experienced severe losses during the GFC.

Prior to the crisis, assets which had low correlations were considered to be effective diversifiers. However, these correlations rose dramatically during and after the crisis. This resonates with previous findings that suggest correlations between asset classes tend to tighten up during market shocks (Szado 2009). Benefits from diversification declined when they were needed the most. Interestingly, implied volatility is one of the few asset classes that displayed negative or low correlations with equities, bonds and commodities and increased in value during market downturns (DeLisle et al. 2010; Luo and Dash 2011). While the S&P 500 lost approximately 50 per cent, its implied volatility index realised a gain of about 125 per cent during the 2008–09 period. This negative correlation has led many investors to explore the implied volatility index as a possible way to provide portfolio protection. As a result, interest in exchange-traded volatility derivatives has increased significantly, as volatility has been considered to be an efficient diversifier for equity portfolios (Szado 2009; and Briere et al. 2010).

These observations raise an important question: 'Does having exposure to an implied volatility index ensure the effectiveness of portfolio diversification, thus improving portfolio performance for Australian investors?' This study focuses on the relationship between the A-VIX and the S&P/ASX 200 Index.

The inverse relationship between price and volatility

Before examining the effects of including implied volatility in a portfolio, it is important to understand the relationship between price and volatility. The strong, negative relationship between prices and volatility is well documented in the literature (Black 1976; French et al. 1987). Numerous researchers have examined the relationship between different asset classes and equity volatility. Several causes are present, yet there are two major empirical and theoretical explanations for this inverse relationship.

The first theory is the 'leverage effect', originally documented by Black (1976). He believes that the most obvious causal relationship runs from changes in the value of the firm to its stock returns which then flow on to volatility changes. This suggests that a fall in a company's value will cause a negative return on its stock and the company's leverage level then becomes higher resulting in higher return-volatility for the stock. There are many studies that support Black's philosophy, such as Christie (1982), Turner et al. (1989) and Bollerslew et al. (2012).

The second explanation is the 'volatility feedback effect' developed by French et al. (1987) who argue that the trade-off between return and risk (where volatility is an indicator of risk) is weakly explained by leverage. They claim that the causal relationship runs from investors' perception of the risk that they must bear to changes in stock prices. For that reason, if there is a rise in uncertainty about future payoffs of a company, investors require a higher rate of return to compensate for the extra risk (uncertainty) that they take. Thus, a change in the business or economic conditions leads to a change in the volatility of stocks and results in lower stock prices. In this framework, an increase in implied volatility is the cause of a reduction in equity prices (Harvey 1989; Nelson 1991; Ozdenoren and Yuan 2008).

Regardless of the underlying causality, a strong asymmetric relationship between price and volatility exists. Drops in stock prices are associated with increases in volatility. However, the magnitude of price and volatility movements is not always symmetric. Haugen et al. (1991) study the reactions of stock prices and the expected returns to changes in volatility. In addition to finding that equity prices and returns are heavily affected by variations in volatility, the authors find an interesting dissimilarity in the volatility reaction to a fall in price, in contrast with an increase in price. Evidently, the market reacts more aggressively to a price drop as opposed to a price rise. Their findings are further supported by Whaley (2009). For that reason, volatility appears to be an effective diversifier of equities as its negative correlation increases in absolute value when it is needed the most.

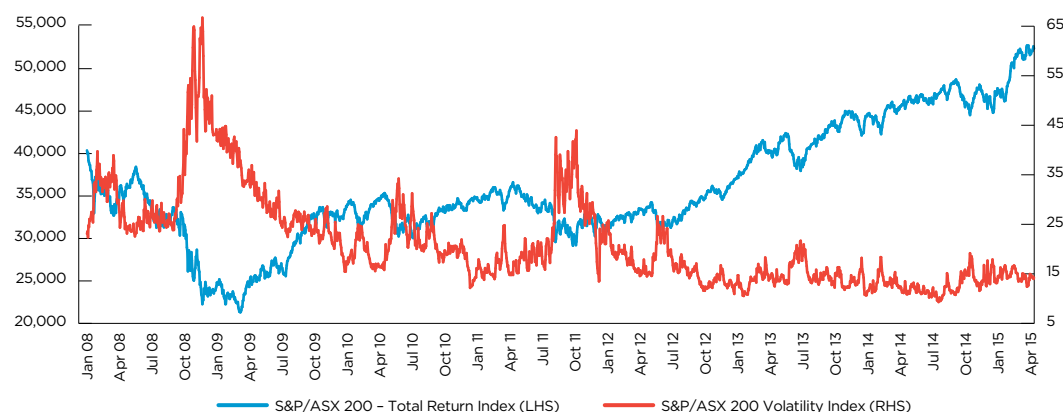
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The Australian Volatility Index (A-VIX)

The Australian Securities Exchange (ASX) introduced the S&P/ASX 200 Implied Volatility Index (A-VIX) in 2008 after the success of the S&P 500 Volatility Index (VIX). The Chicago Board of Options Exchange (CBOE) launched the VIX in 1993. The VIX is an index that measures the 30-day implied volatility of the S&P 500 Index options. Similarly, the A-VIX measures the level of market volatility that investors expect over a 30-day period. The A-VIX is computed based on the mid-point of the bid-ask spread of both S&P/ASX 200 in-the-money and out-of-the-money call and puts options.² Near-term and next-term call and puts options with more than 23 days and less than 37 days to expiration are utilised to compute the A-VIX. These options are rolled over to new contract maturities weekly. The reason for the exclusion of expiring options is to eliminate potential price anomalies driven by maturing options (Whaley 2009).

Asymmetry in correlations

FIGURE 1: Averse movements between the A-VIX and the S&P/ASX 200 Total Return Index



Source: Datastream Database.

Figure 1 demonstrates the inverse relationship between the S&P/ASX 200 Total Return Index and the A-VIX since the implied volatility index was first introduced in Australia. The two indices virtually mirror each other.

The adverse movements, supported by a negative correlation of -0.65 between the S&P/ASX 200 Index and the A-VIX returns, exhibit diversification benefits when the two indices are combined in a portfolio. The behaviour of the implied volatility index is very unique. The index rises aggressively when the S&P/ASX 200 Index drops and only decreases slightly when the S&P/ASX 200 Index rises. This characteristic suggests that the A-VIX appears to be the natural diversifier/protection for portfolios that hold or replicate the S&P/ASX 200 Index.

The behaviour of the implied volatility index is very unique. The index rises aggressively when the S&P/ASX 200 Index drops and only decreases slightly when the S&P/ASX 200 Index rises. This characteristic suggests that the A-VIX appears to be the natural diversifier/protection for portfolios that hold or replicate the S&P/ASX 200 Index.

We used econometric models to test this proposition.³ The following represents the results of these statistical models. Accordingly,

$$r_{A-VIX} = \alpha + \beta_1 r_{ASX200} + \varepsilon \quad (1)$$

$$r_{A-VIX} = \alpha + \beta_1 r_{ASX200} + \beta_2 r_{ASX200} D + \varepsilon \quad (2)$$

Where:

r_{A-VIX} : daily return of the A-VIX

r_{ASX200} : daily return of the S&P/ASX 200 Index

D : a dummy variable which equals 1 if the ASX return is negative.

Equation (1) measures the relationship between the S&P/ASX 200 Index returns and their implied volatility index return. However, since the two indices exhibit an asymmetric relationship, equation (2) is designed to test the diversification benefit of the A-VIX. To support our hypothesis, the coefficient β_2 of equation (2) should be statistically, significantly negative. The regression results are presented below. The negative coefficients are statistically significant at a 1 per cent confidence level. This indicates that our hypothesis on the negative relationship between the A-VIX and the S&P/ASX 200 Index cannot be rejected.

TABLE 1: Regression models

		α	β_1	β_2
Model (1)	coefficient	0.00**	-3.52***	
$r_{A-VIX} = \alpha + \beta_1 r_{ASX200}$	t-stat	2.19	-37.79	
Model (2)	coefficient	-0.00***	-2.60***	-1.79***
$r_{A-VIX} = \alpha + \beta_1 r_{ASX200} + \beta_2 r_{ASX200} d$	t-stat	-3.27	-16.14	-6.99

Notes: This table reports the results of performing regression model 1 and 2. r_{A-VIX} is the daily return of the A-VIX Index. r_{ASX200} is the daily return of the S&P/ASX 200 Index. D is a dummy variable which equals 1 if the ASX return is negative. ** and *** denote 95% and 99% confidence intervals, respectively.

It is clear that there is an inverse relationship between the A-VIX and its underlying index. Results from the two regressions illustrate that during days when the ASX return is negative, the return of the A-VIX will be positive, and vice versa. On average, if the S&P/ASX 200 Index level decreases by 1 per cent, the A-VIX will gain 4.39 per cent⁴ in value but when the S&P/ASX 200 Index grows by 1 per cent, the A-VIX only loses 2.6 per cent. In other words, the rate of change of the A-VIX is greater when the market is experiencing a fall. This clearly reflects not only an inverse relationship but also reveals the asymmetry of movements between the implied volatility index and the underlying asset. This interesting characteristic provides implied volatility diversification benefits over traditional diversification tools such as futures and options contracts.

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One possible explanation for this attractive feature is the usage of options for risk management purposes. Many participants in the options market are portfolio insurers who use put options to protect their portfolios. A drop in the S&P/ASX 200 Index level will cause higher demand for put options which leads to a higher price for the options. Consequently, the value of the implied volatility index will increase. This is also the reason why the volatility index is considered to be more of a barometer of investors' fear rather than a barometer of investors' greed, Whaley (2009).

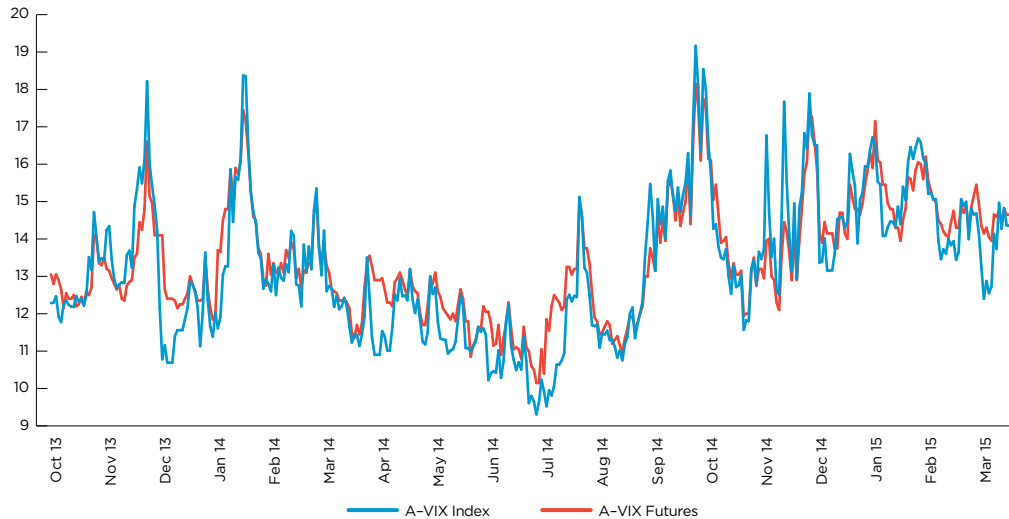
A-VIX exposure in an investment portfolio

The inverse relationship between the A-VIX and the underlying S&P/ASX 200 Index appears to be strong. While the implied volatility index is often used as an indicator of stock price movements, it is, however, unclear whether an increase in implied volatility causes stock prices to drop or if a drop in stock prices leads investors to panic and hence increases their perception of volatility.

The strong inverse relationship between the A-VIX and the S&P/ASX 200 Index could create a new measure for investors to diversify an equity investment portfolio if investments in the former index can be made directly. The only exposure to the implied volatility index is via its futures. In Australia, the capital requirement to initiate a volatility futures trading account is not expensive, not to mention that investors can collateralise their investment portfolio.⁵ However, the behaviours of A-VIX futures are not identical to the A-VIX and could potentially remove the diversification benefits. There are two reasons for this.

First, the implied volatility index is mean-reversed with an average value of 16 to 20 points (Dash and Moran 2005). After periods of high volatility in the market, the index will revert to its average level. In other words, if an investor could invest \$100 directly into the A-VIX and follow a buy-and-hold strategy, they would end up with \$100. In order to make a profit, an investor needs to have the ability to predict crashes and speculate on the short-term sentiments reflected in the A-VIX. Second, the only exposure to the A-VIX is through its futures contracts which have a forward-looking property. Investors who trade these futures are betting on the level of implied volatility at a later point in time. An investor who is certain about a price shock that would cause the A-VIX value to increase in the near future can enter into a long position. However, as futures market participants are aware that this shock will not last long and the VIX index will steadily revert back to its average value, the VIX futures price would not change as much as the underlying index. As a result, the diversification benefit would not be much compared to that of the A-VIX.

FIGURE 2: Price movements of A-VIX and A-VIX futures



Source: *Sirca database*.

Figure 2 illustrates that during periods⁶ of high A-VIX value, the price of the A-VIX futures did not increase by the same amount. Moreover, implied volatility futures contracts suffer from the so-called contango trap where their prices are 'systematically drawn downward toward the level of the A-VIX'. Hence, a buy-and-hold approach with A-VIX futures almost certainly results in a loss (Whaley 2013). For these reasons, A-VIX futures prices will not increase as much as the index, minimising the diversification benefits arising from the asymmetric negative correlation between the A-VIX and the S&P/ASX 200 Index.

Replicating the A-VIX

The A-VIX futures are currently the only direct exposure to the implied volatility index. Unfortunately, the diversification benefit is not effectively utilised via the A-VIX futures. Some raised the question of whether there are other ways to take advantage of the inverse (and asymmetric) relationship between stock prices and implied volatility, perhaps replicating the A-VIX index using options positions.

This is possible since the A-VIX value is computed using the prices of several near- and next-term stock index call and put options. Therefore, one must take long or short positions in all of these options and constantly rollover weekly to replicate the A-VIX index. Unfortunately, we suspect this strategy would entail high transaction costs and potentially wipe out the diversification benefits derived.

Conclusion

Australia's implied volatility index (A-VIX) reflects investors' expectations of future volatility. Our study has shown that the inverse relationship between the Australian equity market and its implied volatility exhibits diversification benefits. Furthermore, the negative relationship becomes stronger when the market experiences downturns. This asymmetric correlation suggests a performance-enhancing feature of the index.

We argue that A-VIX futures do not offer the same diversification benefit as their underlying index, and could potentially weaken investment performance if included. The A-VIX can be replicated using put and call options on the S&P/ASX 200 Index but the costs can be high which eliminates the potential benefit. Nonetheless, as it was recently introduced, the volume and liquidity of A-VIX futures have not yet reached levels comparable to those of other actively traded derivatives. This suggests that there is potential for developing more tradeable instruments based on the A-VIX similar to the exchange-traded products on volatility indices that are available in the US and Europe markets.

The availability of A-VIX futures has opened the door for investors who want to explore the index as a possible way to provide portfolio protection. We argue that A-VIX futures do not offer the same diversification benefit as their underlying index, and could potentially weaken investment performance if included. The A-VIX can be replicated using put and call options on the S&P/ASX 200 Index but the costs can be high which eliminates the potential benefit. Nonetheless, as it was recently introduced, the volume and liquidity of A-VIX futures have not yet reached levels comparable to those of other actively traded derivatives. This suggests that there is potential for developing more tradeable instruments based on the A-VIX similar to the exchange-traded products on volatility indices that are available in the US and Europe markets.

Notes

1. Diversification principally means risk-reduction through a wide range of assets.
2. A comprehensive analysis on the VIX pricing algorithms that provide an in-depth knowledge of the VIX calculation was carried out by Hancock (2012).
3. These econometric models were developed in line with the Whaley (2009) research.
4. 2.6+1.79.
5. See ASX for the list of acceptable assets for collateral. Investors are required to meet variation margins after each trading day.
6. These are the periods in which the A-VIX's diversification benefit is most desired.

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RENMINBI TRADE INVOICING: *Benefits, impediments and tipping points*

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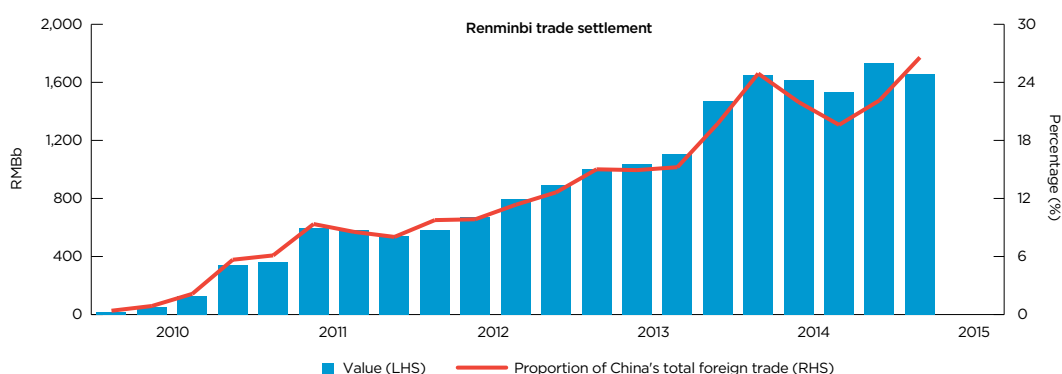
This paper analyses a survey of Australian and Chinese corporates on renminbi (RMB) invoicing awareness, use and expectations. It considers the benefits of RMB trade invoicing as well as a range of factors that would appear to be discouraging its use in trade between Australia and China. It also identifies potential tipping points for increased RMB invoicing going forward.

China has approached the internationalisation of the RMB by taking cautious but deliberate steps towards a more liberalised economy. China's intention to internationalise the currency was clearly identified in its five-year plan and further endorsed by the 18th Plenum in 2013. However, the pathways, sequencing and timing of internationalisation are the subject of considerable debate.

International trade links are well developed with China, now the largest trading nation and set to be the largest global economy by the end of the decade. However, financial links are still limited and the development of these links is essential for the internationalisation of the RMB.¹ Therefore, with China's current account largely liberalised² but its capital account still subject to widespread controls, RMB trade invoicing is very important for the development of offshore RMB business.

Despite the rapid growth in RMB invoicing from its commencement in 2009 to over 24 per cent of China's total foreign trade by the end of 2014 (see Figure A), there is still a substantial gap between total trade with China and settlement in RMB. Ito and Chinn (2013) find that the RMB is underrepresented as an invoicing currency (relative to peers) even after controlling for capital account restrictions. It is therefore essential to understand the potential for a currency to be used in invoicing in order to measure its ability to become an investment or a reserve currency.³

FIGURE 1: Growth in RMB trade invoicing



Sources: CEIC data; RBA.

A considerable proportion of trade between Australia and China is settled in \$US due primarily to the dominance of iron ore trade, which is globally priced in \$US. However, the global pricing of commodities in one currency doesn't preclude invoicing or settlement in another; this is a choice made by the trade partners. Academic research has investigated the invoicing currency choice and provided theoretical arguments for the selected currency, including such factors as the relative bargaining power of trading partners, exchange rate volatility, product differentiation, transaction costs and industry structure.⁴

A fundamental component of the invoicing choice is the determination of who bears the exchange rate risk and there needs to be a convincing business case for a company to alter its invoicing currency. The main reason to settle trade in RMB is that overseas companies can potentially capture a price advantage with market estimates suggesting that Chinese corporates have typically added up to 5 per cent to their quotes in foreign currencies, to hedge against unfavourable exchange rate movements.⁵ If trade counterparties are willing and able to trade in RMB then this buffer can be eliminated, but then the exchange risk is borne by the offshore party. However, the cost of hedging for some offshore parties would appear to be significantly lower than the hedging costs in China, reflecting the greater liquidity and interbank connections offshore. Therefore if the discount offered by a Chinese trade partner is between the cost of hedging in China and the cost for the offshore trading partner then both parties will benefit. This provides a compelling business case for trading partners to initiate a change to RMB invoicing. However, if this case is so compelling, then why does RMB trade invoicing lag established trade patterns?

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The literature on choice of invoicing currency emphasises the importance of ‘inertia effects’: once a currency is well established as a dominant invoicing currency, its critical mass may see this dominance continue beyond the economic dominance of the country. This is particularly true for use of the \$US which dominates pricing and settlement in part due to what Goldberg and Tille (2008) refer to as a coalescing effect. That is where firms minimise price differences relative to their competitors by adhering to the industry choice of invoicing currency. This suggests that a decision to alter the invoicing currency may be considered a risky move away from the ‘herd’. However, the literature also highlights the importance of ‘tipping points’, whereby once a threshold level of invoicing for the currency of a rising economy is reached its use can spread rapidly.

Survey of Australian and Chinese corporates

To get a better understanding of the degree of inertia and potential tipping points in RMB trade settlement, the Centre for International Finance and Regulation (CIFR) commissioned a survey in late 2013 of both Chinese and Australian companies engaged in China–Australia trade. The Australian survey was implemented by domestic and foreign banks on behalf of CIFR and the Chinese survey by Redfern Associates (a mainland China advisory firm) and Austrade.⁶ The survey design was modelled on an earlier RBA survey⁷ and was augmented with the assistance of the RBA, Treasury and market participants through the RMB Working Group which was established at last year’s Dialogue. The primary finding of the survey was that there is enormous potential for growth in RMB settlement, with more than half of all survey respondents indicating that they expected their RMB use to increase in the next five years.

Sample description

There were 93 responses from Australia and 103 from China representing a wide range of industries and trading arrangements (see Table 1). Both the Chinese and Australian samples include a good cross section of importers and exporters and the split is relatively similar in both countries. The surveys capture a wide range of industries with the Australian survey featuring a substantial number of corporates trading in the industrial goods and services, mining and retail sectors. The Chinese survey included a significant number of corporates trading in the food and beverages, mining and industrial goods and services sectors and, on average, these firms conducted 34 per cent of their total trade with Australia. In both surveys, firms were of varying size as measured by the number of employees and by turnover.⁸ The Chinese sample consisted of over 20 per cent state-owned enterprises (SOEs) and also included a significantly higher proportion of small firms than the Australian sample. Over 80 per cent of Chinese respondents were from firms based in China with a similar proportion of Australian-based firms in the Australian sample. In addition, over 65 per cent of all firms conducted business with external trade partners (rather than only intra-group).

The Australian sample was selected by Australian and international banks operating in Australia and most of the respondents were bank clients. In contrast, the Chinese sample was randomly selected without prior knowledge of the respondents' awareness of RMB trade invoicing.

TABLE 1: Sample

Description		Australia	China
Number of responses		93	103
Share with Australia		N/A	34%
Importer/exporter	Importer	55%	61%
	Exporter	30%	25%
	Both	15%	15%
Intra-group/external	Intra-group	13%	24%
	External	68%	65%
	Both	19%	11%
Industry	Industrial	21%	11%
	Mining	19%	14%
	Retail	11%	10%
	Food and beverages	6%	30%
Home based		81%	80%
State owned		N/A	22%
Size by employees	SME	57%	69%
	Large	43%	31%
Size by turnover	Very small	8%	31%
	Small	9%	19%
	Medium	34%	17%
	Large	49%	32%

Awareness

The respondents were asked whether they were aware of the ability to invoice and settle trade in RMB (results presented in Table 2). One of the most significant findings was that awareness in China was relatively lower than Australia with almost half of the small Chinese firms unaware of the opportunity to invoice and settle in RMB. Awareness was also low for private Chinese firms whereas it was considerably higher for SOEs. However, this is likely driven by firm size as the majority of the small firms in the Chinese sample were private. In contrast, 93 per cent of large private firms and 88 per cent of large SOEs were aware of the ability to invoice in RMB. Although the China intra-group sample was above the mean, 20 per cent of Chinese corporates with operations in Australia were also unaware of the ability to invoice in RMB. However, it is encouraging that 44 per cent of the Chinese firms unaware of RMB invoicing indicated that they would consider using RMB in future.

These results are partly affected by the higher proportion of small firms in the Chinese sample; however, the level of awareness in the Australian small firms was much higher. The results highlight considerable growth potential and perhaps the need for a targeted education campaign.

TABLE 2: Awareness

	Detail	Australia	China
Overall awareness		98%	69%
Awareness by importer/exporter	Importer	96%	61%
	Exporter	100%	84%
	Both	100%	75%
Awareness by intra-group/external	Intra-group	100%	64%
	External	96%	66%
	Both	100%	80%
Awareness by industry	Industrial	89%	73%
	Mining	100%	79%
	Retail	100%	90%
	Food and beverages	100%	55%
Awareness by SOE	SOE	N/A	80%
	Private	N/A	64%
Awareness by size/turnover	Very small	86%	53%
	Small	100%	50%
	Medium	100%	78%
	Large	98%	91%

Use

Consistent with the awareness levels, the use of RMB trade invoicing by small and medium firms was negligible in comparison with the use by large firms (see Table 3). This was also the case for private firms with very low usage levels, whereas 40 per cent of SOEs reported that they had used RMB. In contrast to the awareness results, the use of RMB by large firms is dominated by SOEs with only 6 per cent of large Chinese private firms reporting the use of RMB for invoicing and settlement. The variation by industry was evident in both the Australian and Chinese samples with mining firms reporting comparatively higher levels. Although over half of the Australian mining companies reported that they had used RMB trades, most reported that the proportion of these trades was very small.⁹

This is consistent with reports from Australian firms and banks that some mining companies are actively examining the range and liquidity of RMB banking products in preparation for the possibility of being asked to invoice and settle in RMB. In addition, some of them are importing mining-related equipment such as rolling stock from China and are paying for it in RMB, providing them with a further incentive to trial or at least consider invoicing and settling their commodity exports in RMB to create a natural hedge.

The use of RMB by external trading partners appears to account for the only real take-up by Chinese firms, with intra-group transactions very low. As noted earlier, a targeted education campaign would likely help to improve this take-up. In contrast, Australian intra-group RMB transactions are relatively high at 83 per cent.

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TABLE 3: Use of RMB

	Detail	Australia	China
RMB use	Current	37%	12%
	Current share	24%	35%
	Ever	44%	13%
Use by importer/exporter	Importer	40%	11%
	Exporter	50%	24%
	Both	50%	0%
Use by intra-group/external	Intra-group	83%	4%
	External	29%	18%
	Both	72%	0%
Use by industry	Industrial	47%	18%
	Mining	56%	43%
	Retail	20%	0%
	Food and beverages	17%	3%
Use by SOE	SOE	N/A	43%
	Private	N/A	4%
Use by size/turnover	Very small	29%	3%
	Small	75%	0%
	Medium	34%	11%
	Large	48%	30%

Benefits

All firms in the sample were asked to indicate the benefits of RMB invoicing and the results (Table 4) are consistent with expectations. The Australian firms indicated benefits that are predominately related to price and access, with the ability to accommodate Chinese trading partners ranking very high. On the other hand, the benefits identified by Chinese firms are more related to reduced exchange rate risk and improved trade terms.

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TABLE 4: Benefits

	Australia		China	
All firms — advantages of RMB settlement	More favourable pricing	74%	Reduced foreign exchange risk	75%
	Ability to accommodate Chinese companies	44%	Benefits from appreciation/depreciation	58%
	Improved relationships with Chinese trading partners	42%	Improved trade terms	48%

Disadvantages

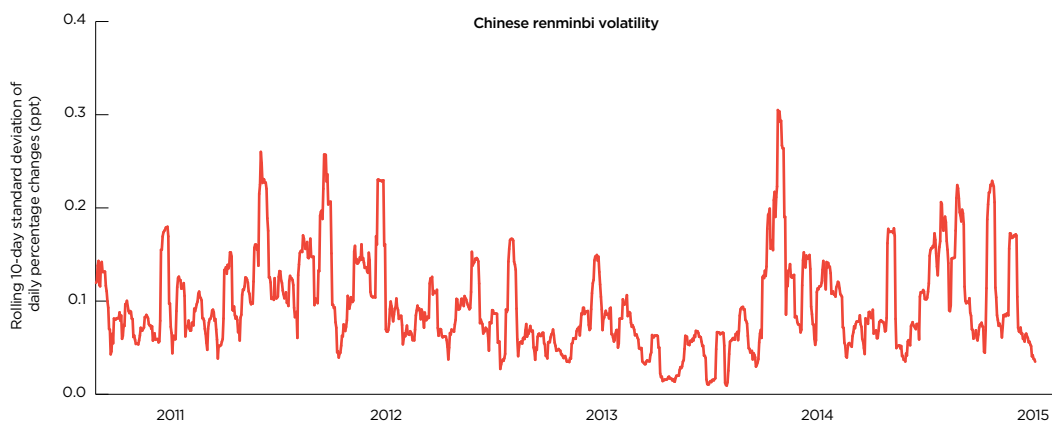
Respondents also identified the disadvantages of RMB settlement and these are separated into respondents who have never settled in RMB and those who have (Table 5). The Australian firms who had never settled in RMB noted the costs of deviating from \$US contracts and the concern that trading partners would be unwilling to settle. This is particularly relevant for the mining sector in Australia where, in most cases, both receipts and a substantial proportion of costs are in \$US.

TABLE 5: Disadvantages

	Australia		China	
Disadvantages — never RMB	Costs of deviating from \$US contracts	31%	Concerns over appreciation/depreciation	58%
	Partners unwilling to settle in RMB	31%	Trade partners unwilling to settle in RMB	50%
	Difficulty in accessing hedging products	27%	Lack of information	41%
Disadvantages — use RMB	Uncertain process	37%	Concerns over appreciation/depreciation	62%
	Payment delays	34%	Payment delays	46%
	Chinese regulatory restrictions	32%	Banks unfamiliar with process	31%
			Uncertain process	31%

On the other hand, the Chinese respondents indicated that the main difficulty with RMB settlement was concerns over losing potential gains from currency movements. Respondents who indicated this concern were predominantly importers, probably reflecting an expectation of continued RMB appreciation. It is important to note that this survey was conducted in October 2013 in a period of sustained RMB appreciation. The recent volatility as evident¹⁰ in Figure 2 and the widening of the RMB trading band to 2 per cent could prompt a reassessment of invoicing choice and encourage more Chinese companies to negotiate to pass on the increased exchange rate risk to their offshore counterparties. In fact, this was pre-empted by one Chinese respondent who noted that 'Currency fluctuations would drive our organisation to change our trade settlement behaviour and favour RMB'.

FIGURE 2: RMB volatility



Sources: Bloomberg; RBA.

Of the firms that had settled in RMB, both the Australian and Chinese respondents noted payment delays and uncertain process as disadvantages with some making comments such as 'lots of red tape and delays in dealings between banks' and 'we have had many payments rejected'. However, many remarked that the speed and efficiency of processing had improved substantially with one Australian respondent commenting that 'Initially there was a major time delay before the beneficiary received the funds; this still exists but the number of days it takes to reach the counterparty has been halved'. Several respondents were particularly positive, such as 'no difficulties encountered as the relevant authorities guided us through the process'.

Australian firms who had not settled in RMB noted that there was difficulty in accessing hedging products but this was not a concern for those who had settled in RMB. There are two interpretations of this. It could mean that firms that are not settling in RMB only perceive a difficulty in hedging (which is not actually present) or that hedging products are incomplete but firms settling in RMB have only limited needs for hedging products, perhaps due to natural hedges within the firm.

Tipping points

One of the most striking results of the survey is that both Australian and Chinese corporates are waiting for the other to initiate a change; 70 per cent of Australian corporates are waiting for Chinese firms to request RMB invoicing and 76 per cent of Chinese corporates are waiting for Australians to accept it. The results reflect something of a 'waiting game' where each firm is waiting for the trading partner to take the lead. It is probably best captured in this response from a Chinese corporate 'Just because a new rule or policy suggests something has benefits, we all know that there may be hidden obstacles. So we wait ... to see how others get through it first'.

One of the most striking results of the survey is that both Australian and Chinese corporates are waiting for the other to initiate a change; 70 per cent of Australian corporates are waiting for Chinese firms to request RMB invoicing and 76 per cent of Chinese corporates are waiting for Australians to accept it. The results reflect something of a 'waiting game' where each firm is waiting for the trading partner to take the lead.

Although the Chinese corporates were waiting for the Australian trading partner to request or accept RMB only 28 per cent expected their trading partner to encourage them to do so. In contrast, 49 per cent of Australian firms expected the push to come from China. Indeed, many corporates, both Chinese and Australian, indicated that Chinese Government intervention was expected to initiate this change. Responses ranged from general comments such as 'depends on government policy' to very specific comments like 'we will use RMB if our government requires us to do so.'

There is also a sense of the need to 'test the water' with corporates trialling a small number of RMB trades. Several made comments such as 'the first few trades were a leap of faith' and 'given the first few deals went through successfully [our use of RMB settlement] will grow over the coming months'. It is likely that a few industry leaders moving to RMB settlement could pave the way for other corporates.

In addition, 37 per cent of Chinese corporates aware of the ability to invoice in RMB indicated that changes to Chinese regulations on VAT and export rebates would make them increase their use of RMB settlement. It has been reported that VAT rebates on exports are more difficult to substantiate if the exports are invoiced and settled in RMB rather than a foreign currency. Perhaps some certainty around VAT rebates could be a driver for increased RMB settlement.

Product availability did not rank highly in the list of disadvantages for those firms with experience in invoicing in RMB; although, as discussed previously, it was listed as a concern for those without RMB experience. Nevertheless, the degree of concern about product availability appears to have diminished since the time of the RBA survey which indicated that 56 per cent of Australian corporates were concerned about the inability to hedge exchange rate risk.

Reflecting on earlier points, an important tipping point is the need for greater awareness among Chinese small- and medium-sized enterprises (SMEs) and private firms as well as some industry specific guidance on the benefits of RMB settlement. The cost of hedging, especially in the wake of increased RMB volatility (Figure 2 above), is an important area where greater awareness is required. If the transfer of hedging costs from China to Australia results in a win for corporates in both countries then the benefits of RMB invoicing will become even more apparent in a period of high volatility. With the widening of the RMB trading band to 2 per cent China appears to be continuing to move away from a system of managed appreciation and seems keen to allow greater RMB volatility. In the face of high derivatives-based hedging costs, this volatility is likely to encourage more Chinese companies to move to RMB invoicing.

Conclusion

As China's relative economic size increases, capital controls are gradually being relaxed, and financial reforms are being smoothly implemented, and it seems inevitable that the RMB will become a major invoicing currency in the Asia-Pacific region.

However, the inertia affecting invoicing currency choice suggests that we should understand the tipping points to greater RMB use and consider action where needed. Australian firms appear to be preparing for RMB invoicing with many firms testing the water with small trades. However, Australian corporates expect the request for settlement in RMB to come from their Chinese trading partners. In contrast, awareness levels in China are relatively low, especially among small private firms, so the request may not be forthcoming. It would seem that increased RMB trade invoicing and settlement in the future will require greater awareness in China, especially in relation to the costs of hedging in a high-volatility market.

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Notes

1. See Eichengreen et al. (2014) for a thorough discussion of the expected pathways for the internationalisation of the RMB
2. While full RMB internationalisation requires, among other things, the relaxation of capital controls, the current account transactions have been fully convertible since 2009.
3. For a good discussion see Lai and Yu (2014).
4. Ito and Chinn (2013) provide a good background to the theory of trade invoicing.
5. Standard Chartered (2014) suggested that companies can shave 2 to 3 per cent off costs by invoicing in RMB whereas Swift (2012) noted that the PBOC have been quoted as saying that importers could save 2 to 3 per cent by paying in RMB. Deutsche Bank (2012) reported that for companies paying exports in RMB the savings averaged 4.8 per cent. The HSBC (2013) RMB Cross Border Trade Settlement Survey indicated that 53 per cent of Chinese businesses would offer discounts of up to 5 per cent for transactions settled in RMB.
6. The Austrade work was led by their Shanghai office, with support from regional offices.
7. Results of the RBA survey are reported in Ballantyne et al. (2013).
8. Size by number of employees is measured as less than 3000 employees for Chinese SMEs and less than 200 employees for Australian SMEs. Size by (annual) turnover is measured as less than ¥30m, ¥300m, ¥500m and over for China. It is measured as less than \$5m, \$10m, \$100m and over \$100m for Australia.
9. Many Australian mining firms noted that their invoicing and settlement in RMB only represented 1 per cent of their total trade with China.
10. RMB is low compared to other currencies but is relatively high compared to historical levels.

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