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Common Ownership of Competing Firms: Evidence from Australia*

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This paper provides the first estimates of the extent of common ownership of competing firms in Australia. Combining data on market shares and substantial shareholdings, we calculate the impact of common ownership on effective market concentration. Among firms where we can identify at least one owner, 31 per cent share a substantial owner with a rival company. Analysing 443 industries, we identify 49 that exhibit common ownership, including commercial banking, explosives manufacturing, fuel retailing, insurance and iron ore mining. Across the Australian economy, common ownership increases effective market concentration by 21 per cent. Our estimates imply that if listed firms seek to maximise the value of their investors' portfolios, then they place the same value on $3.70 of their competitors' profits as on $1 of their own profits. We discuss the limitations of the available data, and the potential implications of common ownership for competition in Australia.

I Introduction

Concentrated markets have been linked to a decline in the labour share (Autor *et al*., 2020), low productivity growth (Nickell, 1996; Blonigen & Pierce, 2016) and low investment (Gutiérrez & Philippon, 2017), as well as high prices (Azar *et al*., 2018), high markups (De Loecker & Eckhout, 2018) and rising inequality (Gans *et al*., 2018). On one measure, more than half of Australia's markets are concentrated (Leigh & Triggs, 2016). By another metric, market concentration in the Australian economy rose from 2002 to 2017 (Bakhtiari, 2021).

In this paper we provide the first Australian evidence on another potential threat to competition: the possibility that the same investors may own rival firms and use their influence to mute the degree of competition in the market. This phenomenon, sometimes termed 'horizontal shareholding', arises most frequently in the case of institutional investors that hold significant stakes in competing firms. Since the incentive of shareholders is to maximise the total value of their portfolio, investors who own rival firms may prefer a degree of competition between the firms that is less than the social optimum.

*This paper had its origins in a mistake made by the authors in a 2017 opinion piece on common ownership for the *Sydney Morning Herald* that erroneously confused nominee shareholders with beneficial shareholders. This led the authors to the present investigation, which attempts to address the problem of Australia's unusually opaque share register by using filings of substantial shareholdings. The authors thank commentators Joe Aston and Terry McCrann for inspiring the current research via their colourful character references. We are grateful to co-editor Flavio Menezes and four anonymous referees for their feedback, and thank Bob Breunig, Hamish Fitzsimons, Joshua Gans, Stephen King, Yuma Osaki, Dean Paatsch, Maya Salama, Martin Schmalz and Matthew Wilson for their insights, assistance with data analysis and comments on earlier drafts.

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To see the problem of common ownership in its simplest form, take the case of a duopoly. If both firms have separate owners, it is in each firm's interest to maximise its own profits. If the two firms are wholly owned by the same person, then it is in the financial interests of the owner for both companies to behave like a monopoly: aiming to maximise joint profits. In the presence of a common owner, the firms are more likely to cosily divide the market than they are to embark on a risky price war.

As Backus *et al*. (2021a) note, most studies of common ownership have been based on reduced-form correlations between ownership structures and consumer outcomes[1]. Azar et al. (2018) found that common ownership among airlines operating on the same route was correlated with higher ticket prices of between 3 per cent and 12 per cent.[2] Azar *et al*. (2019) found that common ownership of banks in a county led to higher fees and lower deposit rates. In pharmaceuticals, Gerakos and Xie (2019) found that incumbent firms were 12 per cent more likely to pay a generic brand to stay out of the market when there was common ownership between the incumbent and the generic brand. In the stock market, Boller and Scott Morton (2020) found that common ownership increased stock returns.

Beyond prices, Azar and Vives (2018) found a strong correlation between rising common ownership and rising inequality in the US. Elhauge (2018) found that common ownership is driving the historically large gap between low corporate investment and high corporate profits. Gutiérrez and Philippon (2017) found that the investment-profit gap was larger in concentrated industries – particularly those with high rates of common ownership. Elhauge (2016) contends that common ownership can help explain fundamental economic puzzles, including why corporate executives are rewarded for industry performance rather than individual corporate performance alone; why corporations have not used recent high profits to expand output and employment; and why economic inequality has risen in recent decades. Although there are still gaps in the empirical evidence on common ownership, some have called for limits to be placed on common ownership (Elhauge, 2016; Posner *et al*., 2017).

While most of the empirical research on common ownership has emerged in the past decade, the issue has a long lineage among policymakers. As Elhauge (2020) notes, the reason the Sherman Act of 1890 was known as an anti*trust* law was that it aimed to ban an arrangement under which shareholders of competing firms pooled their holdings in a trust, which then elected directors who would dampen competition. In blurring the boundaries between firms, common ownership highlights the importance for competition regulators to look beyond formal legal structures to the underlying economic reality.[3]

[1] Two exceptions are Park and Seo (2019) and Ruiz-Pérez (2019), both of which use structural modelling to analyse the impact of common ownership.

[2] The findings in Azar *et al*. (2018) were unsuccessfully challenged by Kennedy *et al*. (2017) and Dennis *et al*. (2017). Dennis *et al*. (2017) argued that the results in Azar *et al*. (2018) were driven by (1) weighting regressions; (2) not applying standard filters; and (3) relying on only the largest 5 per cent of markets. Azar *et al*. (2021) and Schmalz (2021) respond to these critiques in detail and show that their results stand. Subsequent versions of Dennis *et al*. (2017) narrow their original critiques. The remaining claim by Dennis *et al*. (2017), that the panel correlation between airline ticket prices and common ownership is driven by endogenous market shares, had already been disproven by Kennedy *et al*. (2017). Kennedy *et al*. (2017), in turn, argued that the use of price regressions and structural oligopoly models, instead of a reduced-form model as in Azar *et al*. (2018), removed the impact of common ownership on airline ticket prices, a claim subsequently disproven by Park and Seo (2019) (using standard methods from Berry & Jia, 2010) who found that structural estimates of common ownership and a different subsample of the airline data leads to the estimate confirming that there are large effects of common ownership on airline ticket prices. Kennedy *et al*. (2017) also contradicted the subsequent claim of Dennis *et al*. (2017) that the documented positive correlation between common ownership and ticket prices from Azar *et al*. (2018) stemmed from the market share component of the common ownership measure, and not the ownership and control components by showing panel estimates of how prices relate to profit weights, which do not contain market shares.

[3] Contemporary commentators have noted how common ownership might mute competitive pressures. In 2017, CNBC journalist Becky Quirk, when interviewing Warren Buffett following Berkshire Hathaway's purchase of substantial shares in the top four US airlines, asked him: 'You know, Warren, it does occur to me, though, if you're building up such a significant stake in all the major players, is that anything that's, like, monopolistic behaviour? Is there any concern to think that you would say something to the airlines to make them make sure that they're not competing on prices quite the same? What would keep somebody from worrying about that?' (quoted in Azar *et al.,* 2018).

Our paper does not present direct evidence of nefarious behaviour by common owners of Australian firms. Nonetheless, it is useful to consider the various channels through which common ownership might reduce consumer surplus. Just as monopolies can harm consumers without breaking the law, common ownership does not require foul play for consumers to be left worse off. Indeed, one channel through which common ownership can increase prices is by reducing the incentives for firms to energetically compete. As Azar *et al*. (2018) note, 'If a match between lazy principals and lazy agents becomes pervasive in an industry, then in a Cournot model context, industry output declines and margins increase.' This poses a challenge for policymakers, because it implies that common ownership could be a driver of secular stagnation – reducing economic dynamism by blunting the incentives for managers to win market share from rival firms.

But while common ownership can do harm without any illegality, it also increases the incentives for managers to actively seek to constrain competitive behaviour by forming cartels or entering other anti-competitive arrangements (Greenspon, 2019). As Ennis (2014) shows, only around one in five cartels are discovered, so a manager who enters such an arrangement is odds-on not to be caught. Moreover, the probability of detection is presumably lower in the presence of common ownership. Commonly owned firms could also subtly reduce competition through corporate communications, including the sharing of information between shareholders (OECD, 2017; Greenspon, 2019; Park *et al*., 2019).

How are managers made aware of the interests of their common owners? Shareholders can influence managers by direct engagement, voting on board membership, and incentives such as executive remuneration. Large shareholders – including institutional investors – engage regularly with management teams. Managers therefore have an incentive to present a strategic plan that aligns with their largest shareholders' wishes. In effect, managers are internalising the objectives of their shareholders, including shareholders' objectives regarding other firms (Azar, 2017; Anton *et al*., 2018; Elhauge, 2018). Elhauge (2020) argues that it is virtually costless for institutional investors to influence a firm's competitive behaviour by voting on corporate governance matters.

Schmalz (2015) provides a case study of the way in which this might occur. In 2015, an activist hedge fund campaigned to have DuPont's management take a more aggressive approach to winning market share from its major competitor, Monsanto. The campaign was opposed by institutional investors, including BlackRock and Vanguard. Upon the news that the activist campaign against DuPont had been defeated, Monsanto's shares rose 3.5 per cent. Schmalz infers that these institutional investors voted to maximise the value of their entire portfolio, which included significant stakes in both DuPont and Monsanto.

Documenting the channels through which common owners affect competition, Shekita (2020) uses public domain sources to identify 30 cases of common owner intervention across a broad set of industries including pharmaceuticals, oil and gas, banking, and ride-hailing services. Shekita classifies these interventions into three categories: voice, executive compensation and voting. For example, in 2019, BlackRock recorded 2,050 engagements with 1,458 companies in 42 different markets.

Common ownership has some similarity with the situation in which consumers mistakenly think that brands are competitors, when in reality they have the same corporate owner. Examples of 'faux competitors' include Adidas and Reebok, Taco Bell and Pizza Hut, and Dove and Lux. The variety of beers on offer in many pubs belies the fact that the top two manufacturers control around 90 per cent of the Australian market. It would be a mistake to analyse competition in such markets at the brand level, thereby ignoring the corporate structure. Similarly, ignoring overlapping ownership may lead regulators to adopt an overly rosy picture of the true competitive environment.

A significant driver of common ownership has been the rise of institutional investors, particularly index funds. Institutional investors allow small-scale savers the opportunity to invest through a diversified portfolio, but they also benefit considerably from economies of scale. One of either BlackRock, Vanguard or State Street is the largest shareholder in 88 per cent of S&P 500 companies. They are the three largest owners of most DOW 30 companies. Their representation among the top 10 shareholders of US corporations has skyrocketed since the 1990s (Greenspon, 2019).

To date, most of the literature on common ownership has focused on the US (an exception is Burnside & Kidane, 2020, who explore common ownership in Europe, and find it to be less prevalent than in the US). We provide the first

estimates of common ownership of competing firms in Australia and show the extent to which common ownership increases the effective extent of market concentration. Matching data on market shares and financial market shareholdings, we calculate three measures of common ownership: the proportion of firms with common owners, the weight that firms place on their competitors' profits, and the modified Herfindahl–Hirschman index (MHHI), a measure of market concentration that accounts for the impact of common ownership. Our analysis covers 443 industries, with combined revenue equivalent to around 70 per cent of Australian gross domestic product.

To preview our results, we find that 49 out of 443 industries exhibit common ownership. At a minimum, this means that a single shareholder owns 5 per cent of two of the largest four firms. Industries with common owners are among the largest in Australia, collectively representing 36 per cent of total revenues across the 443 industries. Among the subset of firms where we can identify at least one owner, 31 per cent share a substantial owner with a rival company. We estimate that if listed firms seek to maximise the value of their investors' portfolios, then they place the same value on $3.70 of their competitors' profits as on $1 of their own profits. However, given data limitations, this finding should be treated as merely an approximation.

Weighting by industry revenues, common ownership effectively causes the HHI measure of concentration to rise by 21 per cent. In industries that exhibit some degree of common ownership, the effect is much larger: averaging a 60 per cent increase in market concentration. Accounting for common ownership more than doubles the estimate of market concentration for four industries: commercial banking, fund management services, money market dealers and general insurance. Common ownership increases estimated concentration by over 50 per cent for eight industries: concrete product manufacturing, copper ore mining, department stores, electricity retailing, explosives manufacturing, fuel retailing, gas supply and motor vehicle dealers.

It is important to be clear about the limitations of our paper, which merely documents the existence of common ownership in Australia. As will become clear, this is a non-trivial empirical undertaking, but it falls well short of providing a complete picture of common ownership. There are, as Backus *et al.* (2021a) put it, 'myriad empirical gaps in the argument left to fill'. We hope that that our work will help pique the interest of other scholars who will improve on our estimates of the extent of common ownership, analyse the channels through which common owners affect corporate behaviour, and explore whether firms with horizontal shareholdings tend to behave differently from those without common owners.

The remainder of the paper is structured as follows. Section II outlines and discusses several illustrative examples of common ownership. Section III discusses the techniques used for measuring common ownership. Section IV outlines the available data for calculating common ownership in Australia. Section V formally analyses the extent of common ownership across the economy. Section VI concludes with a discussion of the implications of our findings on common ownership for competition policy, and some specific suggestions for further research.

II Examples of Common Ownership

To illustrate the issue of common ownership, Table 1 shows the ownership patterns across five industries: commercial banking, explosives manufacturing, fuel retailing, general insurance and iron ore mining. In banking, BlackRock and Vanguard are among the top three investors for all four major banks. In explosives manufacturing, Vanguard is a common owner in Orica, Incitec Pivot and Downer EDI, while BlackRock and Harris Associates LP are common owners of Orica and Incitec Pivot. Vanguard is a common owner in three major fuel retailers – Coles Group, Caltex and Woolworths Group – with BlackRock a common owner of both Caltex and Woolworths Group. In general insurance, BlackRock and Vanguard are common shareholders across Insurance Australia Group, Suncorp Group and QBE Insurance Group. In iron ore mining, BlackRock is a common owner of both Rio Tinto and BHP Group.

III Techniques for Measuring Common Ownership

One measure of the impact of common ownership is the MHHI, which estimates the impact of common ownership on market concentration. The HHI is expressed as:

$$\text{HHI} = \sum_j s_j^2 \tag{1}$$

where s_j is the market share of firm j. By convention, market shares are expressed on a

TABLE 1
Examples of Industries with Common Owners

(A) Commercial banking

Commonwealth Bank	Westpac	NAB	ANZ
BlackRock (5%) Vanguard (5%)	BlackRock (5%) Vanguard (5%)	BlackRock (5%) Vanguard (5%)	BlackRock (6.1%) Vanguard (5%)

(B) Explosives manufacturing

Orica	Incitec pivot	Downer EDI	MAXAM explosives
Harris Associates LP (7.4%) BlackRock (6%) Vanguard (5%) AustralianSuper (5%)	Schroder Investment Management (9.8%) Harris Associates LP (8.5%) Perpetual Limited (5.8%) Vanguard (5%) BlackRock (5%)	AustralianSuper (8.2%) T Rowe Price Associates (5%) FIL Limited (5.1%) Vinva Investment Management (5%) Vanguard (5%)	n.a. (private overseas company)

(C) Fuel retailing

Coles group	Caltex	Woolworths group	7-Eleven stores
Wesfarmers Limited (15%) Vanguard (5%)	BlackRock (6.1%) AustralianSuper (5.2%) Vanguard (5%)	BlackRock (6.4%) Vanguard (5%)	n.a. (private company)

(D) General insurance

Insurance Australia group	Suncorp group	QBE insurance group	Allianz Australia
Vanguard (5.1%) BlackRock (5.1%)	BlackRock (6%) FIL Limited (5.5%) Vanguard (5%)	Vanguard (6.1%) BlackRock (6%)	n.a. (overseas listed)

(E) Iron ore mining

Rio tinto	BHP group	Fortescue metals group	Hancock prospecting
Shining Prospect Pte Ltd (10.3%) BlackRock (6.2%) Vanguard (5%)	BlackRock (6%) Elliott Capital Advisors LP (5.5%)	The Metal Group Pty Ltd (35.2%) Hunan Valin Group (13.1%) Magnitogorsk Iron and Steel Works (5.4%) The Capital Group Companies, Inc (5.1%)	n.a. (private company)

Note: All shareholders with an ownership stake of ≥ 5% as of 12 December 2019 are shown.

scale from 0 to 100. If one firm has a 100 per cent market share, the HHI is simply $100^2 = 10{,}000$. If two firms have 50 per cent shares, the HHI is $2 \times 50^2 = 5{,}000$. With an infinitely large number of equally sized firms, the HHI $\rightarrow 0$.

The MHHI is the sum of the HHI and MHHI delta, a term that captures the extent to which competitors are connected by common ownership and control. The MHHI delta is a function of β_{ij}, the share of firm j that is owned by investor i; and γ_{ij}, the share of firm j that is controlled by investor i. β_{ij} and γ_{ij} can either be expressed on a scale from 0 to 1 or from 0 to 100 (the scale becomes irrelevant because the numerator and denominator cancel each other). Subscript k indexes firm j's competitors.

To estimate the MHHI delta, we take each pair of competitors and sum the products of γ_{ij} and β_{ik} (the control share of firm j and the ownership share of firm k), then divide that sum by the products of γ_{ij} and β_{ij} (the control share of firm j and the ownership share of firm j). This is then multiplied by the product of the market shares of the two competitors:

$$\text{MHHI} = \underbrace{\sum_j s_j^2}_{\text{HHI}} + \underbrace{\sum_j \sum_{k \neq j} s_j s_k \underbrace{\frac{\sum_i \gamma_{ij}\beta_{ik}}{\sum_i \gamma_{ij}\beta_{ij}}}_{\text{Profit weight}}}_{\text{MHHI delta}} \quad (2)$$

The first term to the right of the equals sign is the HHI; the second term is the MHHI delta.

Two examples help illustrate the MHHI. Suppose that two firms, each with 50 per cent of the market, are purchased by a common owner, which exercises full control over both. In this case, $\gamma_{ij} = \beta_{ij} = \beta_{ik} = 1$. Therefore, the MHHI delta is $2 \times 50^2 = 5{,}000$. With an HHI of 5,000, the MHHI is 10,000. This reflects the reality that the common owner is indifferent between profits earned by either firm, and can therefore be expected to run the two firms in the same manner as a single monopoly.

A second example (adapted from Backus *et al*., 2021a) illustrates the role that other shareholders play in calculating the MHHI. Suppose that the two firms still have a 50 per cent market share, but now imagine they have the ownership structure set out in Table 2, involving three substantial investors. Investor 1 owns and controls 10 per cent of both firms; investor 2 has 10 per cent of firm 1, but no stake in firm 2; and investor 3 has 10 per cent of firm 2, but no stake in firm 1.

TABLE 2
Hypothetical Ownership Structure

	Firm 1	Firm 2
Investor 1 (common investor)	10%	10%
Investor 2 (ordinary investor)	10%	0%
Investor 3 (ordinary investor)	0%	10%
Retail investors	80%	80%

The remaining 80 per cent of each firm is held by small investors, who are presumed not to coordinate with one another.

As before, the HHI = 5,000. But now there are both ordinary and common investors to consider. In the case of the common investor (investor 1), $\gamma_{ij} = \beta_{ij} = \beta_{ik} = 0.1$. In the case of the ordinary investors (investors 2 and 3), $\gamma_{ij} = \beta_{ij} = 0.1$, while $\beta_{ik} = 0$. This allows us to calculate the MHHI delta as $2 \times 50^2 \times \frac{0.1^2}{0.1^2 + 0.1^2} = 2{,}500$. Summing the HHI and MHHI delta gives an MHHI of 7,500.

As Backus *et al*. (2019) point out, a useful way to think about the fractional term in the MHHI delta is in terms of *profit weights*, meaning the weight that one firm puts on its competitors' profits. Profit weights are derived through the framework of Rotemberg (1984) in which firms seek to maximise the total profits of their shareholders. In the absence of common ownership, firms place zero weight on their competitors' profits. If firms are fully owned by the same common owner, they place the same weight on their competitors' profits as they do on their own profits. Numerically, if own-profit weight is normalised to 1, then competitor-profit weight in the case of firms fully owned by the same common owner would also be 1. A profit weight of 0 corresponds to what we would expect in a world of profit-maximising firms, while a profit weight of 1 is what a firm would place on the profits of a newly acquired subsidiary. Backus *et al*. (2021a) argue that because profit weights start with the firm's objective function, they offer a fully general path forward for the study of common ownership.

Recall the first of our hypothetical examples, in which two firms are under the sole control of a single shareholder. In that case, firms place the same weight on $1 of their competitor's profits as on $1 of their own profits. In our second hypothetical example, in which each firm has both a common investor (with a 10 per cent stake) and an ordinary investor (with a 10 per cent stake),

the profit weights equal 0.5. Intuitively, this means that each firm places as much value on $2 of profits earned by its competitor as on $1 of its own profits. Empirically, Backus *et al*. (2021a) show that across S&P 500 companies, the average weight that firms place on their competitors' profits grew from 0.2 in 1980 to 0.7 in 2017.

It is important to note a subtle feature of the profit weight term. Because retail investors are presumed not to coordinate their voting, competitor profit weights can be extremely high if the common owners are the only substantial shareholders. Indeed, in the event that a common investor is the only substantial investor, the competitor profit weight will be 1, regardless of the size of the investor's holding in each firm. Backus *et al*. (2019) present some evidence to justify the omission of 'mum and dad' investors, citing a study that found institutional investors cast their votes 91 per cent of the time, while retail investors voted just 29 per cent of the time.

IV Data Sources and Limitations

Unlike measures of the market share of the top firms, precise estimation of the HHI requires market share data for the full universe of firms. In principle, one could use the Australian Bureau of Statistics' Business Longitudinal Analysis Data Environment (BLADE), but these data do not include shareholdings, and matching shareholdings from external sources creates confidentiality problems that are difficult to resolve within the BLADE environment.

Instead, we source market share data from IBIS World Industry Reports, making adjustments to account for the fact that we do not observe all firms. Two alterations are made in compiling this dataset. First, given we are interested in competition between private firms, industries in which a national or subnational government controls a third of the market or more are excluded. This excludes eight industries: nature reserves, ambulance services, public general hospitals, correction and detention services, police and firefighting, postal services, health services, education and training, and hydroelectricity generation. Second, industries for which market share data are not available for any firms are also excluded. This results in the exclusion of around 40 industries. In total, we analyse 443 industries, a substantial representation of the Australian economy. The IBIS World Industry Reports we use are the most recent available as on 10 November 2019.

A limitation of IBIS World Industry Reports is that they include market share data for only the largest firms – typically, the largest four firms. This is true for other private datasets such as those from MarketLine or BMI Research, and public datasets such as the World Bank's Global Financial Development Database – so in principle our approach could be used by researchers analysing those datasets. In recent years, IBIS World also reports the total number of firms in the industry, which allows us to make assumptions about the distribution of firm sizes outside the top four.

In general, the distribution of firm sizes has been shown to follow a Zipf distribution (Axtell, 2001). We therefore assume that the unobserved firms in each industry follow such a pattern. Our starting point is the largest of the unobserved firms (at the 1st percentile of the unobserved distribution), which we assume to have a market share that is 0.1 per cent smaller than the smallest observed firm. Moving along the distribution, for a firm at the yth percentile, we assume that its market share is $1/y$ as large as the firm at the 1st percentile. For example, we assume that a firm at the 2nd percentile is half as large as the firm at the 1st percentile, that a firm at the 50th percentile is 1/50th as large as a firm at the 1st percentile, and that a firm at the 100th percentile is 1/100th as large as the firm at the 1st percentile. We populate the dataset with the (known) number of firms, ensuring that the total market share of the unknown firms matches the share of the market that remains once we get beyond the largest firms.

Our main focus is on the impact of common ownership on the HHI (rather than on the HHI itself), so we do not expect our main findings to be especially sensitive to this approach to calculating the HHI. As Naldi and Flamini (2014a) show, knowing the market shares of the largest firms permits a fairly precise estimate of the HHI. Across a range of datasets, the correlation between the market share of the largest four firms and the HHI exceeds 0.9. Naldi and Flamini (2014b) show that it is possible to estimate upper and lower bounds for the HHI, based on knowing the market share of the largest firms and the total number of firms in the market. As a robustness check, we re-estimate our results using either the lower or the upper bounds for the HHI (see Appendix A). As expected, this makes no qualitative difference to our results.

With this assumption about the market shares of remaining firms, we calculate the HHI for 443

industries and calculate an average for the Australian economy (weighted by industry revenues, also given by IBIS World's reports). We then identified the firms in these industries that are listed on the Australian Stock Exchange. For each listed firm, we match shareholding data using substantial holding reports from the MorningStar database. This requires considerable data cleaning. Some shareholder names contain misspellings. Minor differences must be made consistent (e.g., Ltd versus Limited). One entry in the MorningStar database suggested that the National Australia Bank had a 6 per cent shareholding in itself. When we inquired about this, MorningStar acknowledged that it was an error and we omit it from our analysis. We also explored using substantial shareholder listings in annual reports, but quickly discovered that these tend to be less accurate than notifications from substantial shareholders themselves. This appears to be a function of both the penalty regime and the focus of the regulator (see ASIC, 2020b).

While it would have been prohibitively time-consuming to fully check the MorningStar database against substantial shareholder notifications lodged with the Australian Stock Exchange, we did check the shareholdings for the major firms in the five industries listed in Table 1. Across these holdings, we identified four errors, three of which were minor (the remaining error was the National Australia Bank mistake described above).[4] This provided us with some reassurance that the MorningStar database is largely accurate. Note that our MorningStar extract was taken on 12 December 2019 to best match the IBIS World Industry Reports data on market share. Corporate shareholdings change over time, so our data will not precisely match the substantial shareholders after this date.

We also drop nominee shareholders given they hold shares on behalf of others; they are custodians rather than beneficial owners. To identify nominee shareholders, we rely on the expertise of Dean Paatsch, co-founder of Ownership Matters, a firm that specialises in a corporate governance research. This involves some fine judgment calls. For example, we drop shareholder disclosures by 'National Nominees', but code disclosures of 'National Nominees (Australian Ethical)' as being held by Australian Ethical, a superannuation fund. We drop all holdings where the shareholder is identified as 'State Street' because we cannot distinguish instances in which State Street operates as a fund manager from those in which it operates as a holding company.[5]

Under Australian law, shareholders are required to publicly report their holdings if they own 5 per cent or more of a publicly traded company (a level known as the 'substantial holding threshold'). This is standard across advanced countries, but represents less investor disclosure than in the US, where investment managers with over US$100 million in holdings are required to disclose all their holdings. US disclosure takes place via quarterly '13(f) filings' to the Securities and Exchange Commission (SEC). In 2017, the US$100 million threshold covered around 4,000 investment managers. In their analysis, Azar *et al*. (2018) also omit shareholders with less than 0.5 per cent of a given firm, on the basis that such shareholders have no weight in the firm's objective function (though they show that their results are not sensitive to this assumption).

How is the omission of shareholders with stakes between 0.5 per cent and 5 per cent likely to affect our analysis? Doubtless there will be some common investors who have shareholdings below the 5 per cent threshold, including those who strategically keep their investments below 5 per cent to avoid mandatory reporting requirements. But there will also be some shareholders that do not have common ownership which are omitted by our analysis. As we have seen, the MHHI delta is a function of the size of common owners *relative to other substantial shareholders*. Consequently, the biases could go either way: the omission of an investor with a 4.9 per cent holding in multiple firms will bias the MHHI delta downwards (because it ignores an additional common owner). But in the presence of some common ownership, the omission of an investor with a 4.9 per cent holding in a single firm will bias

[4] Specifically, we corrected AustralianSuper's holding in Caltex from 6.1 per cent to 5.2 per cent; T Rowe Price's holding in Downer EDI from 5.8 per cent to 5.0 per cent; and Schroder Investment Management's holding in Incitec Pivot from 11.1 per cent to 9.8 per cent.

[5] Omitting State Street involves removing eight substantial shareholder listings from our dataset (compared with over 80 listings apiece for Vanguard and BlackRock). Although we have been unable to obtain a breakdown of State Street's custodian and fund management businesses in Australia, the firm reports that on a global basis it had US$36.6 trillion in assets under custody and/or administration and US$3.1 trillion in assets under management (as of September 2020).

the MHHI delta upwards (because it ignores a substantial shareholder that would counter the voting behaviour of the common owners). Because the mix of investors differs substantially across countries, it is unlikely that analysis of US data could reveal the likely bias in the Australia data.[6]

Four other limitations of our ownership data are worth noting. First, as with the US studies, we do not have data on the ownership of privately held or overseas-listed companies, so we will miss instances in which investors own rival private or foreign-listed firms. Given there may be significant common ownership among firms that are not listed on the Australian Stock Exchange, this omission likely understates the extent of common ownership in Australia.

Second, because IBIS World only reports the largest firms in an industry, there may be other listed firms not included in our dataset that have common ownership (our analysis does not account for overlapping ownership of firms beyond those listed by IBIS World). If there are a substantial number of smaller firms which have the same owners, then this omission would also understate the true extent of common ownership in Australia.

Third, our approach does not take account of instances in which common owners themselves have common owners (e.g., when a firm is partially owned by a bank that itself is partly owned by an index fund). This omission also potentially understates the true extent of common ownership in Australia. For example, an index fund may directly own shares in competitor A and also own shares in a bank that holds a substantial stake in competitor B. Our analysis would capture the direct holding in A, but not the indirect holding in B, and would therefore understate the true extent of common ownership.

A fourth limitation relates to market definition. Measuring market concentration requires data on market shares, and that data inevitably come with predefined markets. Ideally, market definition would be determined based on the underlying economics. Specifically, whether two firms compete in the same market hinges on the degree of substitution between the things they produce.[7] The degree of substitutability is, in part, influenced by how specialised the product is, whether firms are within the same geographic market, and whether firms operate at the same functional level (retail, wholesale, distribution or manufacturing). By contrast, using market share data from IBIS World means we are implicitly adopting IBIS World's definitions of these markets, which, in turn, are based on the Australian and New Zealand Standard Industrial Classification (ANZSIC) system, which is closely aligned to the North American Industry Classification System (NAICS). Such an approach, however, is imperfect because it implicitly adopts their industry categorisation.[8] IBIS World, for

[6] One way to see the impact of the 5 per cent disclosure threshold is to take the hypothetical example in Table 2. Recall that that example had two firms with a 50 per cent market share, a common owner with a 10 per cent stake in each firm, two ordinary owners with 10 per cent stakes in just one of the firms, and the remaining 80 per cent held by retail investors. In that example, the HHI is 5,000, the profit weight is 0.5 $\left(\frac{0.1^2}{0.1^2+0.1^2}=0.5\right)$, the MHHI delta is 2,500 $\left(2\times50^2\times0.5=2{,}500\right)$, and the MHHI is 7,500. Suppose the remaining 80 per cent of each firm is not held by retail investors, but by 20 shareholders who each have a 4 per cent stake. If these investors are all common owners, the profit weight rises to 0.81 $\left(\frac{20\times0.04^2+0.1^2}{20\times0.04^2+2\times0.1^2}=0.81\right)$, the MHHI delta rises to 4,038, and the MHHI is 9,038. Conversely, suppose the remaining 80 per cent of each firm is held by 40 shareholders who each have a 4 per cent stake in one firm, and no common ownership. Under this scenario, the profit weight falls to 0.19 $\left(\frac{0.1^2}{20\times0.04^2+2\times0.1^2}=0.19\right)$, the MHHI delta falls to 962, and the MHHI is 5,962. This suggests that the bounds on the profit weight are very large, with the theoretical maximum (0.81) being more than four times larger than the theoretical minimum (0.19).

[7] As one judicial passage phrased it, 'if the firm were to "give less and charge more" would there be [...] much of a reaction?': Re Queensland Co-Op Milling Association Limited and Defiance Holdings Limited (1976) 8 *Australian Law Reports* 481 at 517.

[8] IBIS World's industry classifications generally follow the 2006 ANZSIC system, which is based on supply-side-based industry definitions. This approach groups together firms that use similar production processes. Unlike the 1993 ANZSIC, which used a mix of supply- and demand-side concepts, the 2006 ANZSIC focuses solely on the supply side. This is not generally a problem for the purposes of competition analysis, but occasional exceptions arise. For example, the ANZIC system (and IBIS World) classify 'Fossil Fuel Electricity Generation' as a separate industry from 'Hydro-Electricity Generation', even although the final product in both industries is electricity. It is worth noting that other analyses of market concentration in Australia (e.g. Bakhtiari, 2021) also define markets according to the ANZSIC framework.

example, assumes that all markets are national markets. Because of these data limitations, our results should be regarded as less precise than corresponding estimates from the US. The exact impact that this would have on our results is ambiguous. A country town with only two hairdressers that are owned by the same person would report high levels of market concentration and common ownership if the market were defined as being restricted to that local town. If the market were considered to be a national market, then both market concentration and common ownership would be substantially reduced. Conversely, the IBIS World market definitions would inflate both market concentration and common ownership if it treated two products as being in separate markets (e.g., soft drink and energy drinks) when in reality consumers regarded them as substitutes.

V Estimating the Impact of Common Ownership on Market Concentration

When we search for common owners across the largest firms in each of the 443 industries identified by IBIS World, we find 49 industries in Australia which have common ownership. Although this is only 11 per cent of total industries, they collectively account for 36 per cent of total industry revenues across Australia. They include health insurance, supermarkets and grocery stores, fuel retailing, plumbing goods wholesaling, fertilizer manufacturing and copper ore mining. The common owners are overwhelmingly institutional investors. A total of 92 per cent of the time, the common owners are either Vanguard (51 per cent of the time) or BlackRock (41 per cent of the time).

The 49 industries with common ownership tend to be more concentrated than those without common ownership. The average HHI in industries with common ownership is 1,202, which is 238 points higher than in industries without common ownership, where the average HHI is 964 (these averages are not weighted for revenue).

As a starting point, we ask the following questions: Conditional on a firm having at least one substantial owner, what is the probability that the firm has at least one owner in common with one of its rivals? How does this probability vary with the number of owners we observe? The results from this exercise are set out in Table 3. Across all 402 firms with at least one substantial shareholder, 31 per cent have some degree of common ownership with another firm in the same industry. This figure is lowest for firms with only a single substantial owner (5 per cent), and highest for firms with two substantial owners (43 per cent).

TABLE 3
Prevalence of Common Ownership Across Firms

Number of substantial shareholders	Proportion of firms that share at least one owner with a rival	Number of firms in this category
≥ 1	31%	402
1	5%	19
2	43%	121
3	32%	71
4	30%	61
≥ 5	22%	130

Because we do not observe ownership stakes below 5 per cent, the analysis in Table 3 omits instances in which, for example, a common owner has a 4 per cent share of one firm and a 6 per cent share of another firm in the same industry. Among the 402 firms analysed in Table 3, it is therefore likely that the true extent of common ownership exceeds 31 per cent.

We also calculate the profit weight for every pair of firms in the dataset. Recall that the profit weight denotes the weight that a firm puts on its competitor's profits. For example, a profit weight of 0.1 means that a firm places the same weight on $10 of its competitor's profits as on $1 of its own profits. By definition, profit weights are zero where either firm in the pair is a private or overseas-listed company (because we only observe the ownership of listed Australian firms). We then average each firm's profit weights (with each of its competitors in a given industry) to derive a single profit weight for each firm within a given industry. Since IBIS World lists four firms for most industries, most firms' overall profit weights are an average of three pairwise profit weights (for each of their three competitors).

Averaging across all listed firms in our dataset, we estimate the average profit weight is 0.10. If we weight firms by their revenue, the average profit weight for listed firms is 0.27, which is our preferred estimate. Taking the inverse of the profit weight (1/0.27) implies that if listed firms seek to maximise the value of their investors' portfolios, then they place the same value on $3.70 of their competitors' profits as on $1 of their own profits. Comparing this figure with the

estimate of Backus *et al*. (2021a) for the S&P 500, the estimated average profit weight of 0.27 for listed Australian firms is close to the average profit weight for large US firms in 1980 (0.2), and considerably below the average profit weight of listed US firms in 2017 (0.7) (although the data limitations discussed above could skew the Australian results in either direction).

All estimates of profit weights depend crucially on the assumption that firms maximise the total profits of their shareholders. There are multiple reasons why this may not occur, including the possibility that institutional investors have less influence than the model suggests, that institutional investors do not in fact wield their power for anti-competitive ends or that corporate managers do not acquiesce to such pressure. For an empirical test of whether the profit weight approach predicts pricing decisions in the US breakfast cereal market, see Backus *et al*. (2021b). In the case of the Australian estimates, the available data also limit the precision of profit weight estimates. All these factors should lead our profit weight estimates to be regarded as merely suggestive; hopefully to be further refined by future research.

We turn now to estimate the MHHI for each industry, which is a function of both profit weights and market shares. We find that common ownership has a substantial effect on effective market concentration. Weighting by industry revenues, we find that across all industries, the average MHHI (which accounts for common ownership) is 21 per cent higher than the average HHI. Among those industries that exhibit some degree of common ownership, the average MHHI is 60 per cent higher than the average HHI (again, weighting by industry revenues). Table 4 sets out the HHI and MHHI for the 49 industries that exhibit common ownership, sorted in descending order of the degree to which common ownership increases effective market concentration. The largest increases are for commercial banking, where the MHHI is 281 per cent higher than the HHI, money market dealers, where the MHHI is 255 per cent higher than the HHI, and fund management services, where the MHHI is 140 per cent higher.

Of particular interest is whether there are industries in which there is a lot of common ownership that currently receive limited attention from regulators. The US Department of Justice (2018) applies a rule of thumb that an HHI over 1,500 implies a relatively concentrated industry, while an HHI above 2,500 implies a highly concentrated industry. Furthermore, the department's merger guidelines make clear that it uses these thresholds for guidance in terms of which mergers may cause competition concerns. Specifically, the guidelines state that 'Transactions that increase the HHI by more than 200 points in highly concentrated markets [those with an HHI over 2,500] are presumed likely to enhance market power.' The same is true in Australia. The merger guidelines of the Australian Competition and Consumer Commission (ACCC) state that 'the ACCC will generally be less likely to identify horizontal competition concerns when the post-merger HHI is less than 2000' (ACCC, 2008).

Naturally, policymakers should not purely focus on the MHHI, which has a different conceptual basis than the HHI. Even if our estimates of the MHHI were not affected by the data limitations we outline in Section IV, it would still make sense for policymakers to consider both the HHI and MHHI. Still, it is interesting to see how the MHHI differs from the HHI, with reference to the (admittedly arbitrary) thresholds of 1,500 and 2,500.

Across the Australian economy, using the US Department of Justice thresholds, nine industries are in a different category for the MHHI than the HHI. General insurance, concrete product manufacturing, life insurance, and metal roof and guttering manufacturing are unconcentrated on the HHI, but relatively concentrated on the MHHI. Commercial banking, iron ore mining and explosives manufacturing are relatively concentrated on the HHI, but highly concentrated on the MHHI. Money market dealers and fund management services are unconcentrated on the HHI, but highly concentrated on the MHHI. Under both the Australian and US merger guidelines, all these industries would attract more attention from the regulators under the MHHI compared with the HHI. Figure 1 plots for each industry the HHI and MHHI. Industries on the diagonal (with solid markers) have no discernible common ownership. Industries above the diagonal (denoted with hollow markers) have some degree of common ownership. The further an industry is above the diagonal line, the more that common ownership affects market concentration.

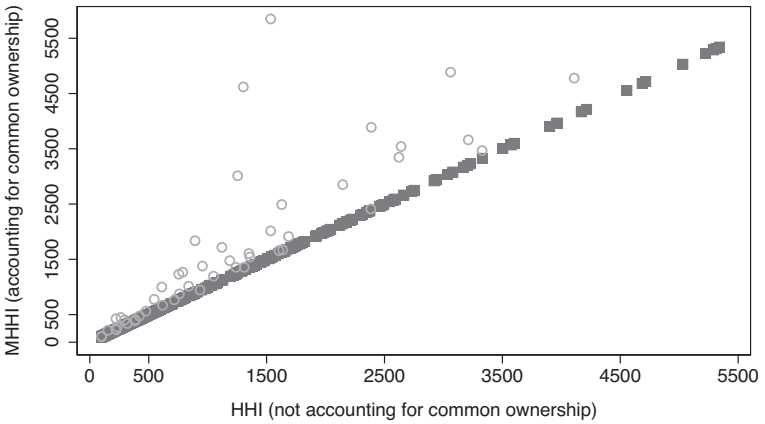
VI Implications of Common Ownership

The rise of common ownership has been linked to consumer detriment in airlines, banking and

TABLE 4
Market Concentration and Effective Market Concentration in Industries with Common Ownership

Industry	HHI	MHHI	% change
Commercial banking	1,534	5,850	281%
Money market dealers	1,303	4,621	255%
Fund management services	1,254	3,014	140%
General insurance	893	1,840	106%
Motor vehicle dealers	223	425	91%
Superannuation funds management services	264	446	69%
Fuel retailing	610	998	64%
Gas supply	756	1,233	63%
Explosives manufacturing	2,388	3,889	63%
Electricity retailing	789	1,269	61%
Department stores	3,061	4,888	60%
Concrete product manufacturing	1,121	1,717	53%
Copper ore mining	1,628	2,491	53%
Fossil fuel electricity generation	955	1,378	44%
Financial planning and investment advice	546	776	42%
Retail property operators	155	215	39%
Consumer goods retail	294	405	38%
Plaster product manufacturing	2,641	3,543	34%
Iron ore mining	2,147	2,854	33%
Fertilizer manufacturing	1,535	2,017	31%
Liquor retailing	2,623	3,347	28%
Insurance brokerage	1,188	1,478	24%
Basic inorganic chemical manufacturing	839	1,013	21%
Life insurance	1,350	1,605	19%
Hardware wholesaling	475	562	18%
Mineral exploration	234	276	18%
Bauxite mining	4,109	4,780	16%
Oil and gas extraction	758	877	16%
Alumina production	3,211	3,661	14%
Computer and software retailing	1,049	1,194	14%
Metal roof and guttering manufacturing	1,359	1,544	14%
Health insurance	1,687	1,914	13%
Timber wholesaling	421	474	13%
Internet publishing and broadcasting	1,241	1,357	9%
Gold ore mining	616	671	9%
Glass wool, stone and non-metallic mineral product manufacturing	222	240	8%
Mortgage brokers	718	769	7%
Citrus, banana and other fruit	319	340	7%
Superannuation funds	385	406	5%
Office property operators	100	104	4%
Clay brick manufacturing	3,327	3,465	4%
Hardware and building supplies retailing	1,310	1,358	4%
Iron smelting and steel manufacturing	1,605	1,661	3%
Plumbing goods wholesaling	1,637	1,671	2%
Ceramic product manufacturing	383	390	2%
Mining support services	224	228	2%
Industrial and other property operators	100	101	1%
Plastic pipe and plastic packaging material manufacturing	934	946	1%
Supermarkets and grocery stores	2,385	2,411	1%

FIGURE 1
How Common Ownership Changes Market Concentration.



Note: *Hollow markers denote industries with common ownership. Excluded are four industries with a Herfindahl–Hirschman index (HHI) above 6,000 (none of which have any common ownership)*

pharmaceuticals. At the economy-wide level, common ownership has been linked to growing inequality, declining rates of investment, rising executive remuneration and a fall in the labour share. Understanding the extent to which common ownership of competing firms exists in Australia is particularly important given the economy has relatively concentrated markets.

In this paper we provide the first estimates of the extent of common ownership in Australia. Combining data on market shares and shareholding information for firms in 443 Australian industries, we search for instances of common ownership across competing firms and report three metrics of common ownership. Conditional on observing at least one substantial shareholder, 31 per cent of firms share an owner with one of their major rivals. We find that approximately 10 per cent of industries (representing a third of total output) exhibit common ownership. For the Australian economy as a whole, we estimate that common ownership increases effective market concentration by 21 per cent. If listed firms seek to maximise the value of their investors' portfolios, then they place the same value on $3.70 of a competitor's profits as on $1 of their own profits. Once again, it is worth noting that data limitations mean that our results should be treated as ballpark estimates, upon which future researchers will hopefully improve as more information becomes available.

As we have noted, the contribution of our paper is essentially to identifying the presence of common ownership in Australia. This leaves open a range of other important research questions. From a corporate governance perspective, it would be valuable to know more about the influence of large minority shareholders over board decisions, the processes that guide institutional investors in their voting and engagement with firms, and the relationship between boards and management on competition matters. From a legal standpoint, it would be useful for researchers to explore how the law shapes the decisions of investors, boards and managers when deciding how aggressively firms should engage in competition with their rivals. From an economic perspective, it would be instructive to know more about whether there is any relationship between firm behaviour and common ownership in Australia, as has been observed in the US airline, banking and pharmaceutical industries (the industries in Table 1 might provide a useful starting point for such research in the Australian context).

Given that common ownership is largely driven by the rise of institutional investors, any problems may well grow over coming decades. The rise of index investing appears inexorable, as

savers recognise that index funds tend to produce higher returns than actively managed funds. But because index investing offers significant returns to scale, it increases the risk that a few behemoth institutional investors dominate the industry – and consequently end up holding large stakes in competing firms.

Because of this risk, policymakers and regulators should actively monitor common ownership, and produce regular estimates of its impact on the effective degree of market concentration. In adjudicating merger requests and foreign investment proposals, it may be appropriate to consider both the MHHI and HHI in assessing the degree of concentration in a market. In addition, the direct engagement and voting patterns of large institutional investors merit scrutiny, given the possibility that they aim to maximise the profitability of their total portfolio rather than the profitability of each constituent firm.

Finally, the potential for common ownership to undermine competitive markets suggests that there should be more transparency about who owns listed firms. A register of beneficial ownership would provide important insights into the overlapping ownership of Australian firms. Another option would be to reduce the threshold at which substantial shareholdings are reported from 5 per cent to 1 per cent (although to date the Australian Securities and Investments Commission (ASIC) has shown little interest in such an approach; ASIC, 2020a).

In recent decades, the US has provided more transparency on share ownership than most other advanced nations. While OECD financial regulatory authorities generally use a threshold of 5 per cent as the point at which substantial shareholdings must be reported (Capobianco, 2017, p. 44), the US additionally requires full disclosure of investments by investors whose portfolios exceed US$100 million. However, the US is now likely to substantially reduce the available data on common investment. In July 2020, the SEC issued a proposed rule increasing the reporting threshold from investors with US$100 million or more in assets to investors with US$3.5 billion or more in assets. If brought into force, it will lead to considerable imprecision in researchers' estimates of the extent of common ownership in the US. In considering the appropriate disclosure threshold, researchers should take account not only the administrative burden on investors, but also the public policy value of being able to accurately estimate common ownership. Only by 'following the money' is it possible to obtain a true understanding of the competitive landscape.

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Appendix A

Estimating Upper and Lower Bounds for the HHI, Given Incomplete Market Share Information

Naldi and Flamini (2014b) show that if we know the market shares of the largest firms, and the total number of firms in the market, then it is possible to estimate the lower and upper bounds of the HHI. This allows researchers, for example, to estimate bounds on the HHI given the four-firm concentration ratio and the total number of firms in the market.

For most markets, the IBIS World dataset that we use contains the shares of each of the largest four firms, but for some industries it lists more of the largest firms. Therefore, we present the formulas for the HHI bounds in their general form rather than for the special case in which there are four known firms.

We can define the market share of the unknown firms as:

$$R = 1 - \sum_{i=1}^{M} s_i \tag{3}$$

where s_i is the market share of firm i; N is the total number of firms in the market; and M is the number of firms whose market share is known.

We can also define the ratio of the market share of the unknown firms to the market share of the smallest known firm as:

$$Q = \frac{R}{s_M} \tag{4}$$

The HHI is lower the more equally the market is shared, so the lower bound is defined by the case in which the unknown firms equally share the remainder of the market:

$$\text{Lower Bound} = \sum_{i=1}^{M} s_i^2 + \frac{R^2}{N - M} \tag{5}$$

The upper bound is slightly more complicated. The HHI is at its maximum when the market is concentrated in the smallest possible number of firms. This leads to two cases. If $R \leq s_M$, the upper bound is the case in which all the residual market share is assigned to the $(M + 1)$st company:

$$\text{Upper Bound } (R \leq s_M) = \sum_{i=1}^{M} s_i^2 + R^2 \tag{6}$$

Alternatively, if $R > s_M$, the upper bound is the case in which the residual market share is allocated among the smallest possible number of the unknown firms. This will be the case in which a handful of unknown firms each has the same market share as the Mth company. There will be Q such firms. In this instance, the upper bound is:

$$\text{Upper Bound } (R > s_M) = \sum_{i=1}^{M} s_i^2 + s_M^2 Q + \left(1 - \sum_{i=1}^{M} s_i - s_M Q\right)^2 \tag{7}$$

Table A1 repeats the analysis in Table 4, showing for each industry the lower bound for the HHI, the upper bound for the HHI and the change in the HHI as a result of common ownership (in Table 4, the ΔHHI is the difference between the HHI and MHHI). Industries appear in the same order in Table A1 as in Table 4.

TABLE A1
Bounds on Market Concentration in Industries with Common Ownership

Industry	HHI (lower bound)	HHI (upper bound)	ΔHHI
Commercial banking	1,496	1,833	4,316
Money market dealers	1,243	1,608	3,318
Fund management services	1,179	1,352	1,761
General insurance	761	1,112	946
Motor vehicle dealers	143	223	203
Superannuation funds management services	133	264	183
Fuel retailing	559	828	388
Gas supply	634	891	477
Explosives manufacturing	2,353	2,388	1,500
Electricity retailing	693	943	480
Department stores	3,059	3,085	1,828
Concrete product manufacturing	1,096	1,345	597
Copper ore mining	1,604	1,741	863
Fossil fuel electricity generation	782	1,153	423
Financial planning and investment advice	485	739	231
Retail property operators	67	155	60
Consumer goods retail	221	299	111
Plaster product manufacturing	2,635	2,666	902
Iron ore mining	2,128	2,281	707
Fertilizer manufacturing	1,495	1,535	482
Liquor retailing	2,616	2,687	724
Insurance brokerage	1,140	1,476	290
Basic inorganic chemical manufacturing	750	1,153	174
Life insurance	1,315	1,538	255
Hardware wholesaling	404	475	88
Mineral exploration	45	308	42
Bauxite mining	4,108	4,110	672
Oil and gas extraction	708	956	119
Alumina production	3,167	3,211	451
Computer and software retailing	1,006	1,181	144
Metal roof and guttering manufacturing	1,237	1,361	186
Health insurance	1,657	1,797	227
Timber wholesaling	282	421	53
Internet publishing and broadcasting	1,224	1,443	116
Gold ore mining	528	829	55
Glass wool, stone and non-metallic mineral product manufacturing	145	222	18
Mortgage brokers	663	882	51
Citrus, banana and other fruit	194	356	22
Superannuation funds	116	385	21
Office property operators	3	100	4
Clay brick manufacturing	3,314	3,353	138
Hardware and building supplies retailing	1,250	1,310	48
Iron smelting and steel manufacturing	1,560	1,605	56
Plumbing goods wholesaling	1,574	1,663	34
Ceramic product manufacturing	169	387	7
Mining support services	56	224	4
Industrial and other property operators	3	100	1
Plastic pipe and plastic packaging material manufacturing	851	1,057	12
Supermarkets and grocery stores	2,377	2,493	26