

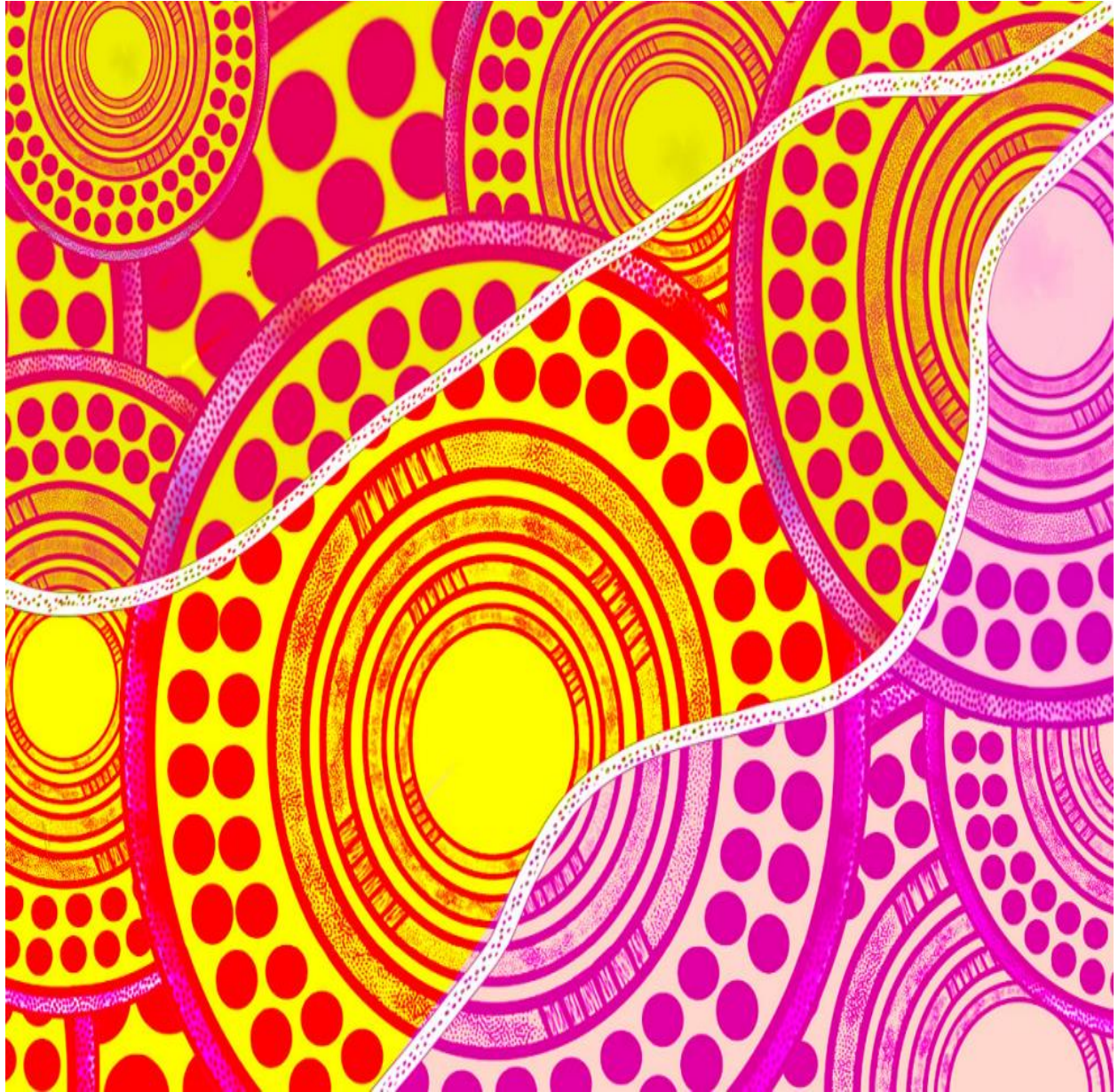
RMIT Innovation Catalyst

Financial Wellbeing Reporting in the Australian Media

Data for Good

Insights Paper

May 2024



RMIT University acknowledges the people of the Woi Wurrung and Boon Wurrung language groups of the eastern Kulin Nation on whose unceded lands we conduct the business of the University. RMIT University respectfully acknowledges their Ancestors and Elders, past and present. RMIT also acknowledges the Traditional Custodians and their Ancestors of the lands and waters across Australia where we conduct our business.

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About the report

What are the most important problems we are grappling with as a society and how are those challenges reflected in the media? That simple question was the starting point for this media analysis project.

“What are the most important problems we are grappling with as a society and how are those challenges reflected in the media?”

At the RMIT Innovation Catalyst, we unite community groups, local industry and RMIT’s own research expertise in pursuit of innovative solutions. So, with our big question in mind, we sought out partners who could help us define the problem and work on a solution. Good Shepherd Australia New Zealand and The Global Institute for Women’s Leadership took up the challenge and we formed an interdisciplinary team to investigate financial wellbeing and the way the Australian media reports on this issue.

We used a machine learning technique, called topic modelling, combined with access to a large data set to take a different approach to understanding financial wellbeing. We know that the scale of this problem requires innovating with new methods and materials, so we set out to explore the public conversation as it is represented in the mainstream news media.

Using the Factiva database, we accessed a data set of text media articles with the labels “personal finance” or “family finance” going back to 1990. We have identified topics and trends in this enormous corpus of media data using cutting edge machine learning methods. Unparalleled access to a comprehensive set of published articles makes our findings more robust.

What follows is an introduction to our most interesting findings, leaving more to discover and more work to be done with the trove of information that we have. Nevertheless, we have plenty of new insights to share and we hope to initiate a new, productive conversation about financial wellbeing in Australia.

Throughout this paper, we present some provocations. These are questions for further research and consideration. Perhaps you know the way to find some of the answers; please join this conversation with us, share your thoughts, come to one of our events at the Social Innovation Hub and help us to tackle our biggest challenges through innovation and collective action.

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Importance and Impact

Once-in-a-lifetime cost of living pressures are currently affecting households as Australia's economy grapples with inflation and flow-on effects from Covid-19. Inflation rates are the highest in decades and multiple Reserve Bank interest rate rises are squeezing family budgets in ways that few have experienced before. Internet searches to Australia's largest health and welfare service directory for food relief, Ask Izzy, have reached the highest levels on record in the past 12 months.¹ Our public conversations have an important role to play in supporting people through this difficult time and public attitudes towards financial wellbeing are key drivers of policy change and program development to support people experiencing, or vulnerable to, financial stress.

Financial wellbeing

Financial wellbeing means being able to manage day-to-day expenses, have resilience to cope with unexpected financial shocks, have security for the future, and feel comfortable to make choices to enable one to enjoy life.

Financial wellbeing as a concept has grown in popularity over recent years. Researchers in Australia and globally have worked to define it, measure it, and explore its drivers. While specific components of financial wellbeing – such as financial literacy and financial capabilities - dominated the research attention in earlier years, we now recognise that there are a wider range of social and economic factors that affect people's finances. Financial wellbeing as an umbrella term is a better reflection of what we mean when we are investigating people's financial lives.

For this work we define financial wellbeing as people's ability to manage day-to-day expenses, and to live a full and comfortable life, free from financial stress, have resilience to cope with life's unexpected events, and have security for the future. Financial capability can contribute to financial wellbeing, but government policy and societal factors are more potent. The term also highlights the fact that people's wellbeing and their ability to live happily and safely are intimately tied to their financial situation. An Australian study from 2018 showed that lower income levels are associated with higher levels of psychological distress.² And low incomes compound the effects of many other kinds of social disadvantage.

As we discuss in this report, women face a unique set of challenges to securing financial wellbeing. Industries characterized by lower levels of pay are more likely to have a higher proportion of women employees compared to men. Women are less likely to be promoted to leadership positions which often come with a substantial salary increase. Women typically carry a higher load of family and caring responsibilities that keep them out of the workforce or necessitate part-time or casual work, all of which reduce their prospects for career progression. The result is systematically lower lifetime earnings and superannuation balances compared to men. In our study, we have looked at the different topics that men and women write about in the media as a proxy for the real differences in financial wellbeing that men and women experience. This helped us deepen our understanding of the factors influencing the gender divide in financial wellbeing.

Media consumption

This report explores how financial wellbeing is discussed in the Australian media, seeking insight into the issues and topics that the media cover in relation to household finances. Using the assumption that media is incentivised to cover matters that are of interest to readers can help us understand what matters to the community while keeping in mind that there are other incentives that drive media coverage. While this analysis reveals what commentators do discuss in the media, it is also important to note the gaps and identify topics that aren't included in media coverage. What are the consequences of silence around certain financial topics? Are there financial issues that are not seen as worthy topics of discussion?

A 2023 survey of news readership found that not only are women turning away from news media, but only 30% of Australian women compared to 54% of men found financial and economic news easy to understand. This gender gap is the highest of the 46 countries surveyed for the Reuters Digital News annual reports.³ These low engagement rates may also hold clues about how we can help people be better informed and potentially improve financial wellbeing.

The largest traditional media organisations - which are dominated by white men in management positions - play an agenda-setting role that shapes the news.⁴⁻⁶ Smaller outlets add nuance and fill niches that mass media cannot reach. And even though these are not the only key media figures in our daily lives, independent commentators and influencers are impacted by - and impact - our news feed.

We hope that our work will also create more informed and critical media consumers who are conscious of the broader conversation in which they find themselves.

What can topic modelling tell us?

Topic modelling is typically used to analyse large volumes of raw text to find trends and common themes. Drawing on recent advances in AI and machine learning, topic modelling is a true collaboration between humans and machines. Computers use their remarkable pattern recognition abilities to process far more text than a team of researchers ever could. The computer algorithm finds clusters of words that are likely to appear together in a document. These word clusters must then be interpreted by a human research team with subject matter expertise. The researchers impose meaning on the patterns found by the computer. By reading a sample of articles and placing the word clusters in their proper context researchers can create semantically meaningful topics. The computer can then categorise all the documents in the dataset using these topics.

“We have analysed 114,739 articles, covering all material published in the Australian media about financial wellbeing, including personal and family finance since 1990”

The remarkable strength of the topic modelling approach is its ability to analyse a comprehensive set of documents, where there are thousands (or even millions) of documents in the dataset. It would never previously have been possible for a research team to analyse every single text article published in Australia about financial wellbeing, personal or family finance from 1990 to the end of 2022 (114,739 articles in all). But that is exactly what we have done. This gives us a sense of the changes in our public conversation across time. As society and the nature of media publishing has changed, we can also see changes in the topics we talk about. For policy makers and advocates alike, we have new insights into the topics the financial media is talking about, and those that are missing.

See Appendix 2 for a detailed methodology.

Findings

In this report we highlight the most salient topics that emerged from our analysis to demonstrate the shifting narrative about financial wellbeing. This is not an exhaustive analysis of our results but a dive into some of the dominant topics related to financial wellbeing.

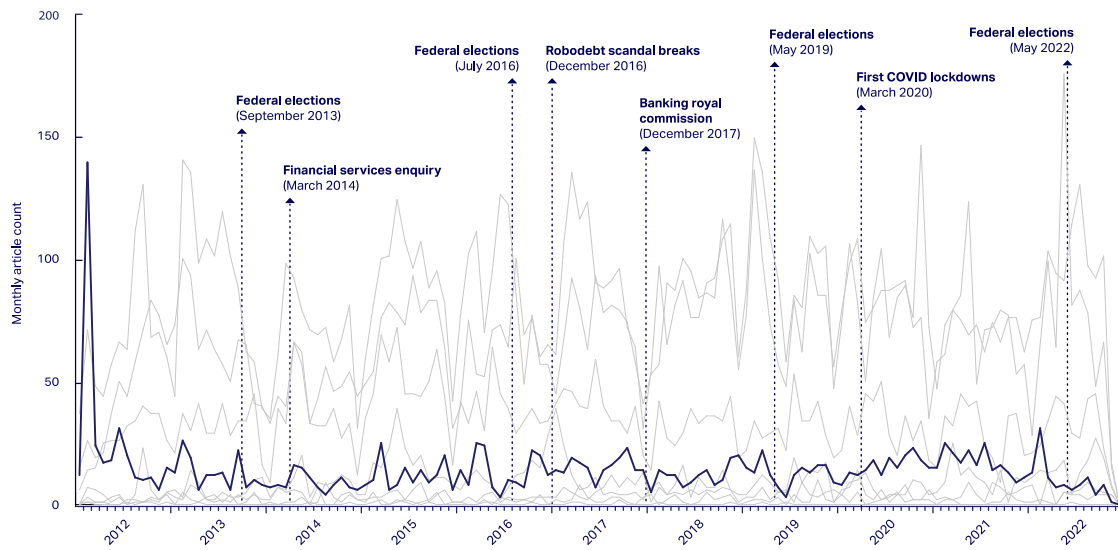
The topic model used to generate our findings included 60 topics. The research team deemed nine of these to be unrelated to the concept under investigation and the full list of 51 relevant topics and the topic names created by the research team are detailed in Appendix 1. As some of the topics were quite similar, six topics were combined to create the aggregate topic “Property”, another six were combined to create the topic “Retirement” and a further nine topics were aggregated into the “Investing” topic.

Online publishing has reduced the cost of publication and dramatically increased the volume of articles that are published on every subject over the past 20 years. This is reflected in the dataset, which contains an average of 916 articles each year in the 1990s and 6,579 articles on average from each year in the 2010s.

Interestingly, the proportion of all material in the database that is related to financial wellbeing including topics of personal and family finances has decreased from roughly 0.49% to 0.23%. While these are small numbers in absolute terms, it seems that the salience of finance for Australian media consumers has fallen by about half over the period covered by our study. It is being crowded out by the wide array of topics covered by the media today. This is surprising given the importance of financial health and wellbeing to many parts of our lives.

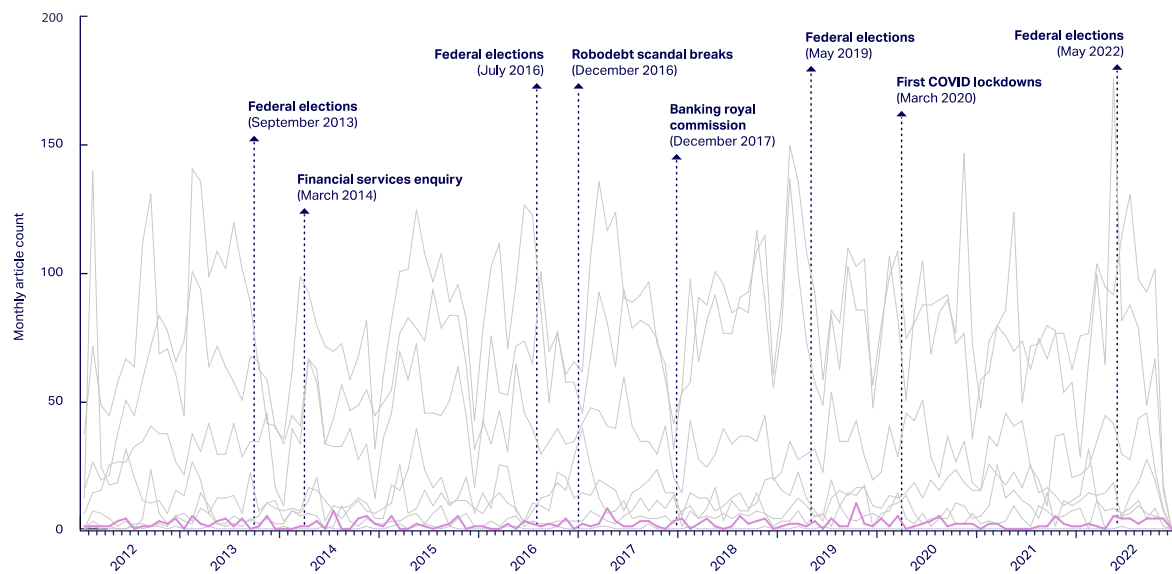
The mix of topics mentioned within the financial wellbeing discourse is also changing over time. Unsurprisingly, topics relating to financial technology, such as “payments and fintech” are increasing in volume over time as are topics gender equality in financial and employment terms. In contrast, topics relating to specific financial products such as index funds and self-managed super funds have reduced over time. Mentions of government services and supports for people on low incomes have tracked at a consistently low rate in the financial press.

Figure 1 – Articles about financial scams



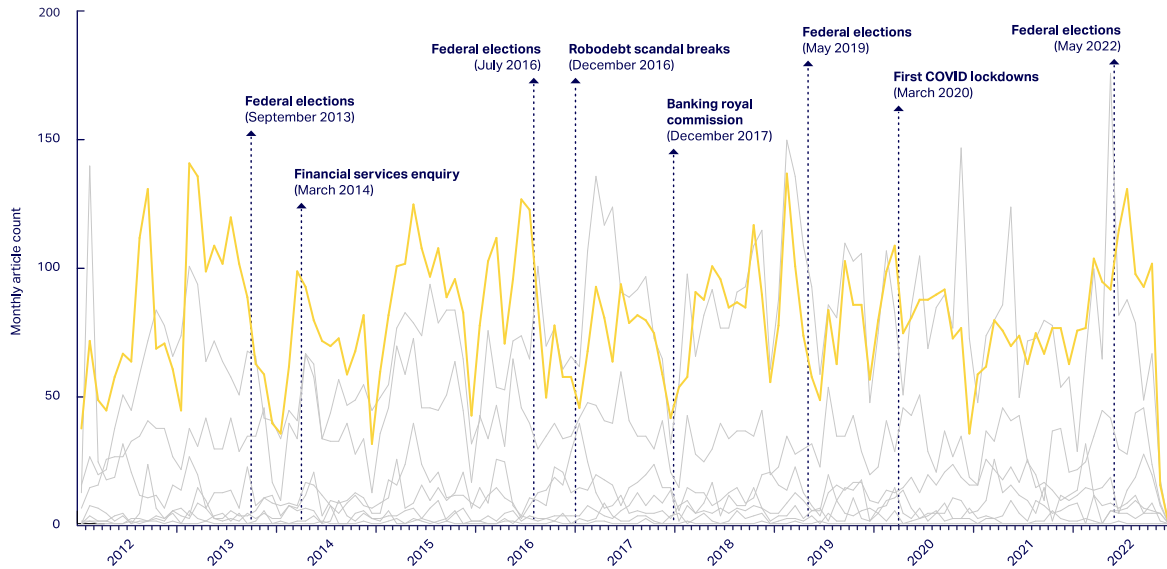
This chart shows the number of articles published in each month on the topic of financial scams.

Figure 2 – Articles about interest rates



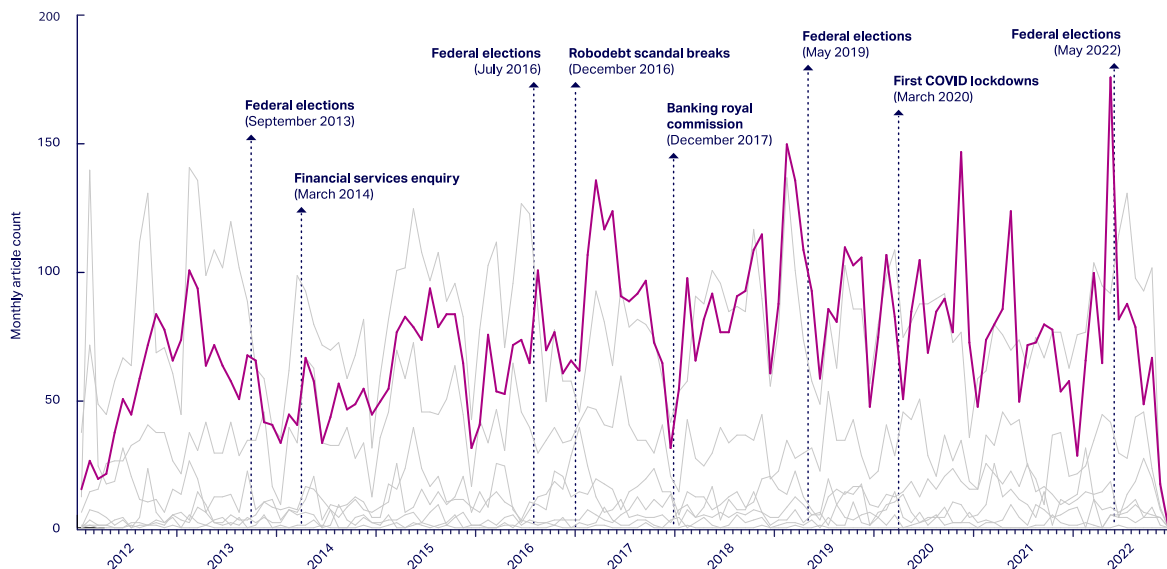
This chart shows the number of articles published in each month on the topic of interest rates.

Figure 3 – Articles about investing (aggregated)



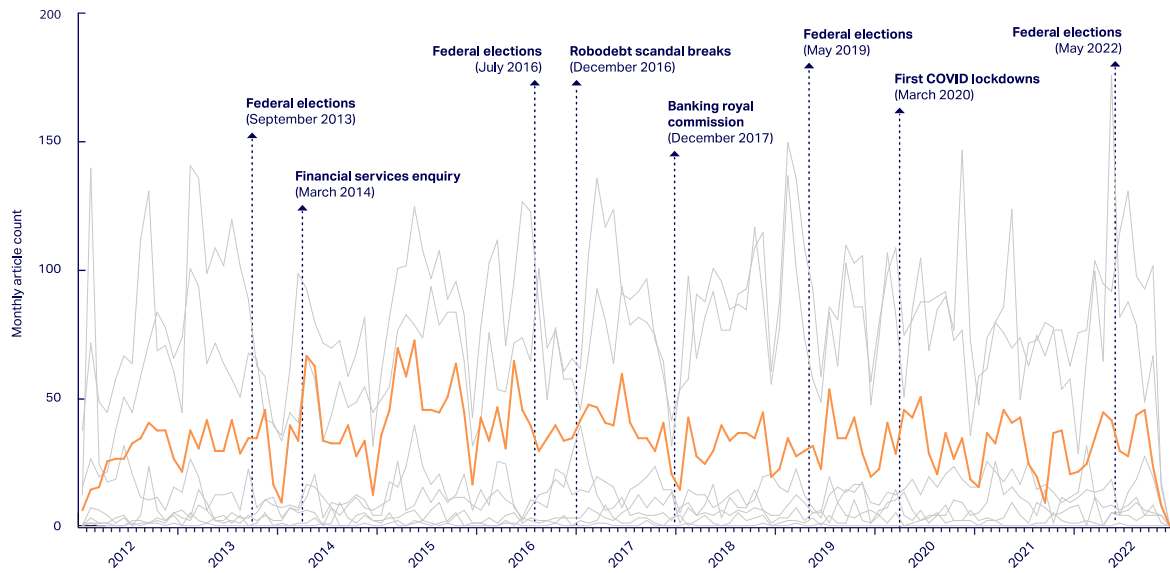
This chart shows the number of articles published in each month on the topic of investing. It combines the following topics from the topic model: index funds, fund managers, stock warrants (options), Australian stock market, ethical investing, common investing terms, bonds, trading warrants, and gold price.

Figure 4 - Articles about property (aggregated)



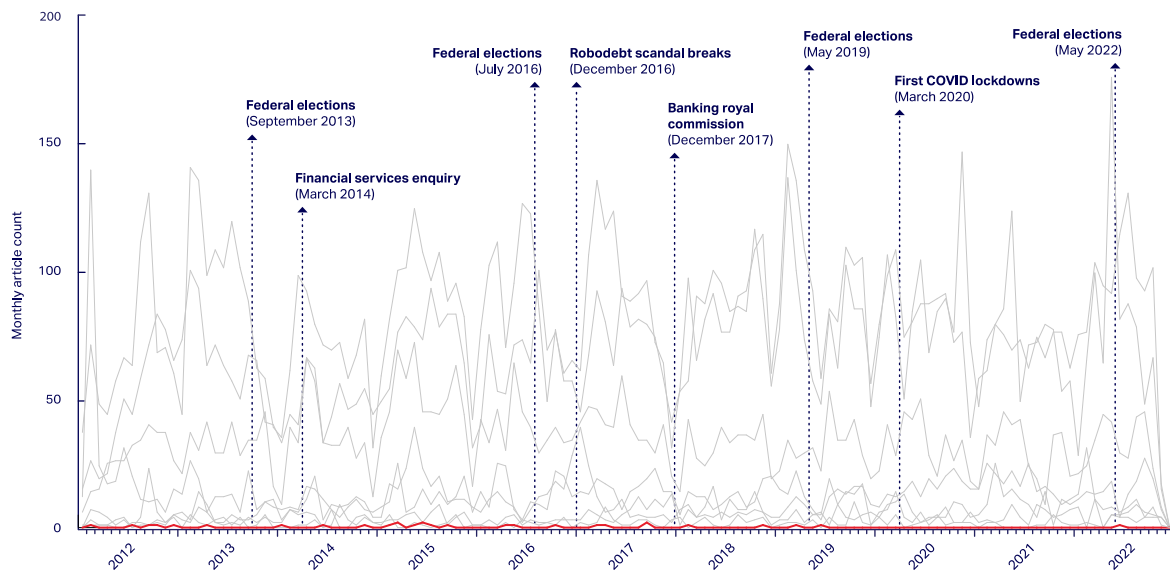
This chart shows the number of articles published in each month on the topic of property. It combines the following topics from the topic model: property market, houses and property listings, mortgages, property investing, first homebuyers, and housing.

Figure 5 - Articles about retirement (aggregated)



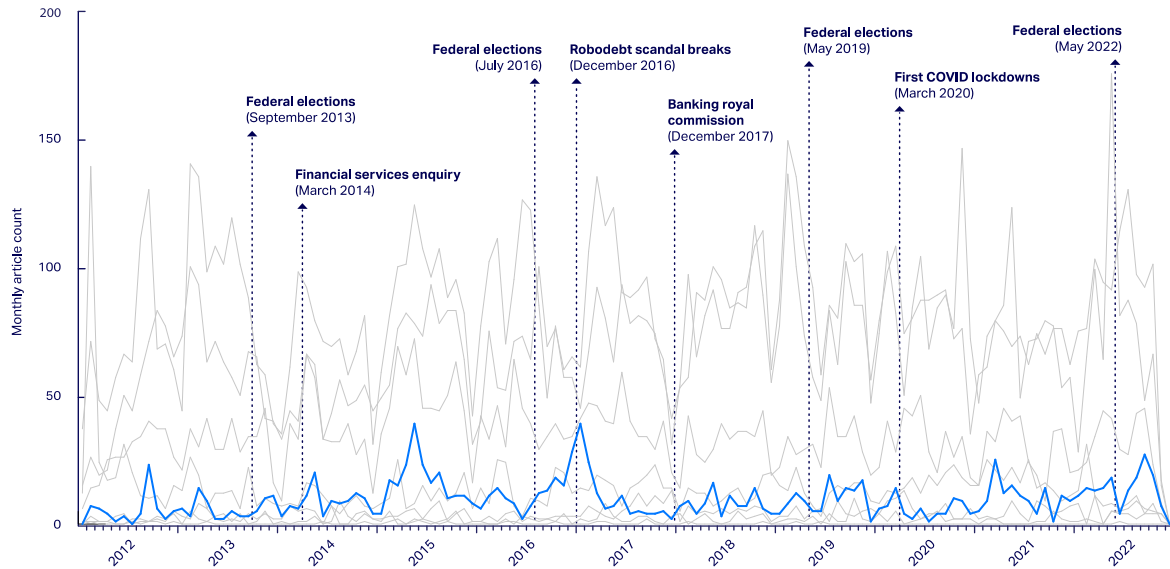
This chart shows the number of articles published in each month on the topic of retirement. It combines the following topics from the topic model: Salary sacrifice into superannuation, Retirement, superannuation 1, self-managed super funds, and lost superannuation accounts.

Figure 6 – Articles about health care



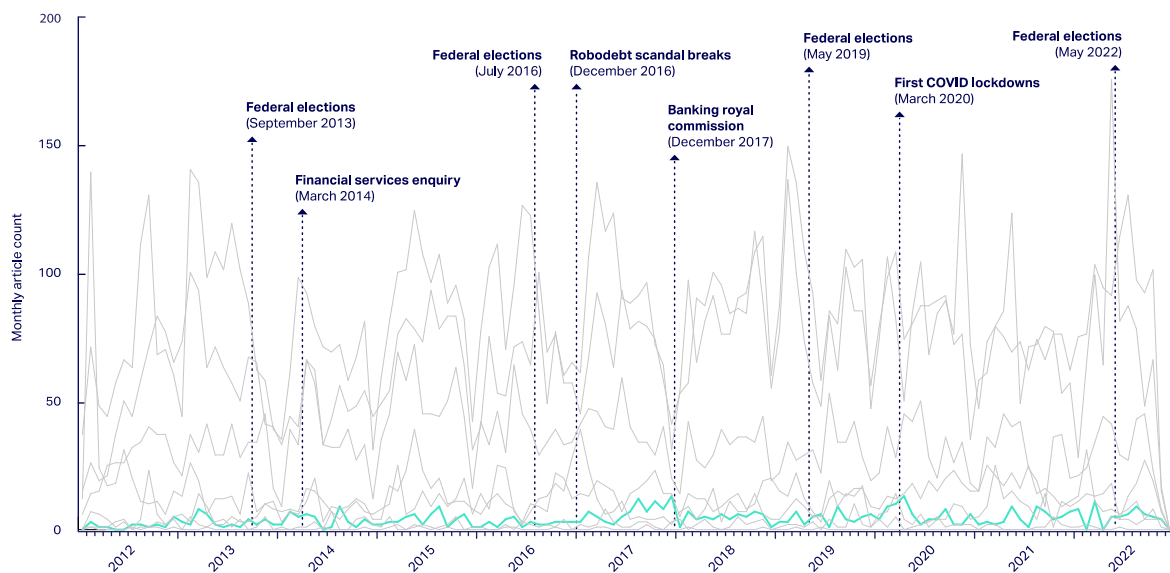
This chart shows the number of articles published in each month on the topic of health care.

Figure 7 – Articles about pensions and social security



This chart shows the number of articles published in each month on the topic of pensions and social security.

Figure 8 – Articles about workplace gender equality



This chart shows the number of articles published in each month on the topic of workplace gender equality.

Explore more of our results using our interactive, online chart: [LINK: <https://sairamdgitte.github.io/topic-wise-line-chart/>]

Retirement, Investment and Property

Some things are remarkably consistent when we look at the Australian financial media over the past 30 years. Retirement, investment and property are top of mind for Australia's financial journalists. In other words, what they write about, and what we read about are primarily of interest to people who earn middle and higher incomes and who are also the main news customer base. Our topic model produced several (6-8) topics on each of these themes. They were similar enough that we rolled them together to highlight more accurately how much these themes dominate financial conversation and advice.

Some of the topics included under the umbrella of retirement were, superannuation, pensions and self-managed super funds. As the Australian population ages, the concerns of retirees are likely to increase in representation in the media. It's already likely that older and wealthier people are more likely to pay for news content, which reinforces the media's emphasis on these issues.

In Australia, housing and property are seen as a necessity that's frequently used as a store of personal wealth and we can clearly see in our data that people love to talk about it. Sub-topics such as first-homebuyers, mortgages and property investing make up the aggregate 'property' topic. Interestingly, some of the generational tensions that exist in Australian society were very apparent in the property discourse. There are topics relating to "first home buyers" and "family legal affairs" containing keywords such as 'boomer', 'millennial' and 'affordable'. This may point to the fact that housing unaffordability and financial hardship are becoming more entrenched. Families that do not already own property find it incredibly difficult to enter the market or support their children to do so – and this can also apply to people who are on middle class incomes. At the same time rents are increasing dramatically. ABS data confirms that the likelihood of home ownership is decreasing with every generation.⁷ Another important issue is the increasing time it takes to save for a home deposit compared to previous generations.⁸ The majority of journalists are most likely experiencing difficulties in saving for a home⁹ and their own experiences may be reflected in the reporting.

Investment advice of a more general kind is another ever present feature of the financial media. It remains a huge topic of discussion, but we can see that general investing advice (stock markets, ETFs, bonds etc..) was the most dominant topic until September 2016 when it was overtaken by property as the dominant topic.

Important events like the 2014 Australian Financial Services Inquiry and the 2017 Royal Commission into Misconduct in the Banking, Superannuation and Financial Services Industry had major impacts on the Australian financial system and flow-on effects for how people save and protect themselves financially.¹⁰ Reports that the banking industry were 'on notice ... to reconnect with their sense of duty and the Australian people, and to reconfirm their responsibilities to the Australian economy' may confirm that the media took up its role as a source of information for individuals who could no longer trust the institutions that had traditionally supported them.¹¹

Australians have had a pre-occupation with property investing for a long time – the great Australian dream of owning a home or property is ingrained in our psyche.¹² But our data suggests it has become an even larger obsession over time. This is not so surprising when we consider that the Australian property market has sustained real returns that are higher than the stock market over many decades (a surprising and slightly worrying result). Furthermore, Australia has less secure rental options than many other countries where renting is more common. There is a certain irony with this growing obsession as

we experience a worsening housing crisis because it conflicts with other major Australian self-preoccupations as a nation of mateship, fair go and egalitarianism. We have a growing rate of people unable to afford their own home and thereby falling further behind in terms of financial security and consequently reducing intergenerational financial wellbeing. More dire is the growing rate of homelessness as the affordability crisis impacts on rental costs. It is becoming impossible to hang onto our view of ourselves as a country where you get a fair go, when we can't even help our kids to secure a reasonable rental property.

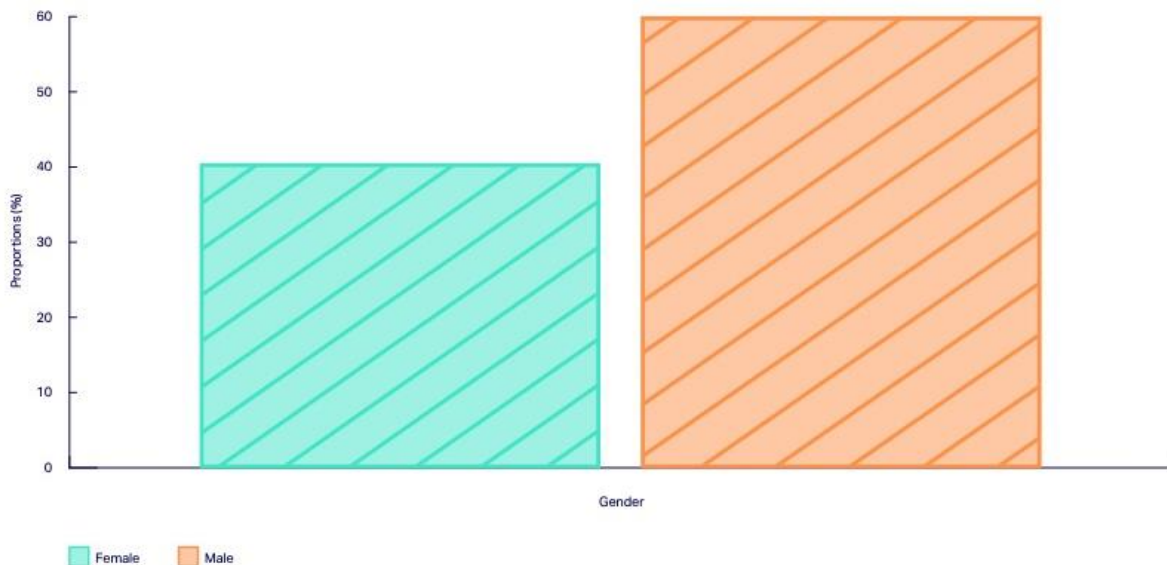
Provocations

- Adequate housing is a human right first and foremost. Australian's view it as a 'financial product'. How can we steer public conversations away from profits and towards housing security for all Australians?¹³
- The media serves many purposes and roles, including a social purpose to the community. Does the media have a responsibility to support the financial wellbeing of all people? Not just those who are better off financially? Is there a market for financial news for readers who experience financial stress or are on low-incomes and excluded from the wealth creation opportunities available to middle-to high income people? What is the role of the public broadcasters in this space?
- Commercial news media organisations have a responsibility to their shareholders to be profitable companies. But news often profits from stories that trade in fear, disaster and scaremongering. Is it reasonable to expect the news media to support financial wellbeing, which is predicated on security, resilience and capability? Should the commercial news media be encouraged to adopt another way of doing news, such as Solutions Journalism? Or Constructive Journalism?

Gender and Financial Reporting

Traditionally men and women have played different roles in household financial management, reflecting broader gender norms¹⁴. Women would more commonly managed the household budget and day-to-day expenses while men had stronger interests in investments. To better understand how these stereotypically ‘female’ and ‘male’ topics are covered by the financial media and who is more likely to discuss them, we looked at the gender of the authors in our dataset and analysed the topics on which they wrote. It’s important to note that the topics a journalist writes about are not driven purely by their interest. The focus of the news outlets with respect to their target audience, the make-up of their newsroom, and the priorities of their editors can drive these decisions. Thus, the differences that we observe in reporters’ gender across various topics tell us as much about the media industry as it does about the community at large.

Figure 9 – Overall division of authors by gender



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Overall, financial wellbeing is more likely to be discussed by men than by women, with the dataset split almost 60% to 40%. In the Australian journalism profession as a whole women have outnumbered men since 2015,¹⁵ so we know that this trend is shifting and the more recent financial journalism has a more equal gender split.

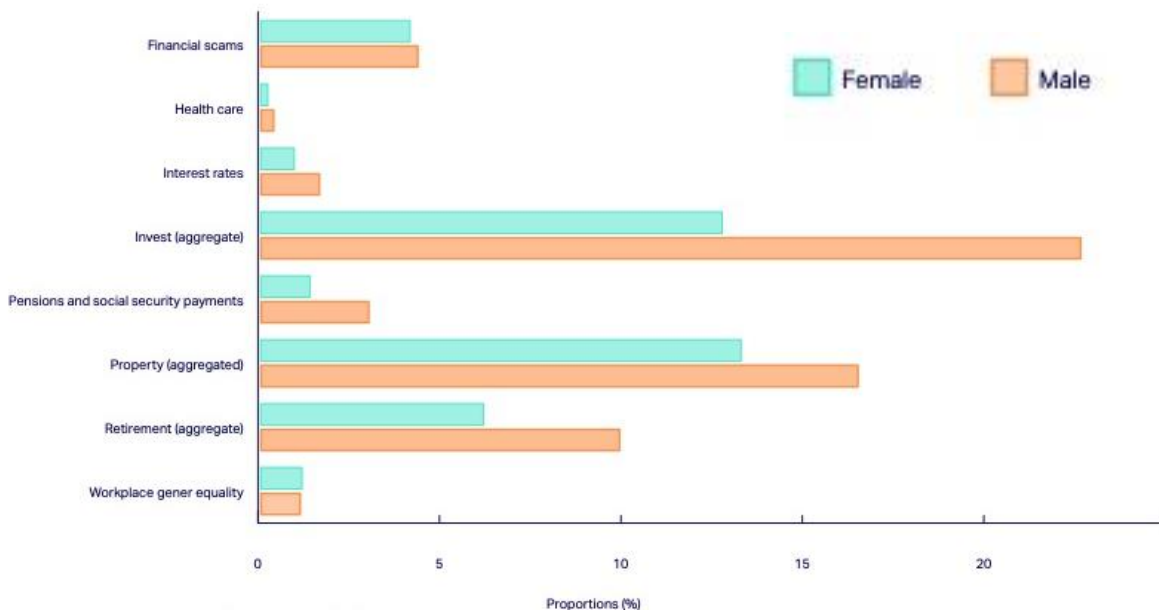
Women’s voices are presented and engaged in the media differently to men, with the Women’s Leadership Institute of Australia, Trawalla Foundation and The Global Institute for Women’s Leadership 2021 *Women for Media Report*¹⁶ finding that only 31% of expert quotes used in news stories are attributed to women. The report also found that among journalists, men quote women less often than women journalists: men quoted women 37% of the time, as opposed to women who quoted women

50% of the time. In opinion pieces, women were less likely to write about business (30%), as opposed to general news media where 40% of business bylines were by women.

Other research confirms that the media tend to divide news topics into the hard 'male' news around politics and business and less important soft 'female' areas such as the arts, education, and health, and most female journalists are being pigeon-holed into the traditionally female story areas.

Curtin University and GIWL's 2023 *Going on the record: Gendered experiences of media engagement* report¹⁷ further highlighted a problem in that women were just as willing as men to agree to a media interview request, but worryingly, were more likely to receive sexist abuse post article publication. A total of 38% of women respondents had experienced online trolling in response to appearing in the news.

Figure 10 – Division of authors by gender for selected topics



These general factors all help to explain the differences we see between the topics in our model that men and women tend to write about. Adjusting for the gender imbalance in the authorship in the dataset overall, Table 1 shows that women are over 50% more likely to write about workplace gender equality compared to men. While men are 46% more likely to write about pensions and social security payments (Table 1).

Table 1 – Topics in which men or women writers are over-represented, compared to the baseline

	WOMEN	MEN	LIKELIHOOD OF A WOMAN WRITING ABOUT THIS TOPIC (accounting for the overall % of women writers)	LIKELIHOOD OF A MAN WRITING ABOUT THIS TOPIC (accounting for the overall % of men writers)
Financial scams	4.15	4.37	1.41	0.71
Health care	0.23	0.40	0.85	1.18
Interest rates	0.96	1.66	0.87	1.16
Invest (Aggregate)	12.75	22.64	0.84	1.19
Pensions and social security payments	1.39	3.02	0.68	1.46
Property (Aggregate)	13.27	16.50	1.20	0.84
Retirement (Aggregate)	6.17	9.93	0.92	1.08
Workplace gender equality	1.17	1.13	1.53	0.65

OVERALL PROPORTIONS

Women authors	40.08	0.67
Men authors	59.65	1.49

Provocations

- How can we make sure that women’s financial needs are well represented in media coverage?
- How can we address the social media backlash women experience post article publication?
- How can we promote the use of women experts among journalists?

What's missing from the conversation?

The latest measure of the financial wellbeing of Australians shows a decline over the last few years.¹⁸ There are increasing numbers of people who are financially stressed, and also an accompanying decline in those who are doing financially well.¹⁸ The focus on financial wellbeing is timely and it is important to discuss the role of media in framing our understanding of this area of our lives.

In a 2020 paper Roslyn Russell and Ashton de Silva noted that financial capabilities are associated with many other forms of wellbeing including, “health, housing security, environment, work, leisure, social connectedness and community vitality”.¹⁹ Yet many Australians are living in financially precarious situations and do not know where to turn for help. A 2019 survey found that one in three Australians lack the trust in financial institutions to overcome their dissatisfaction with their financial situation.²⁰ Other barriers to improving their financial situation include feeling overwhelmed by finances and not knowing how to navigate the complex financial landscape. Those surveyed tried using government services such as MoneySmart tools, or read self-help books, but the survey authors noted that there is an appetite and need for greater access to affordable and trustworthy financial education, tools and support in Australia.²⁰ These findings highlight the gap in information and discussion between topics covered by the media that are of interest to middle – high income earners and that would be helpful for Australians who are trying to manage on lower incomes.

While there have been considerable changes to consumption of traditional news media habits among people globally, people in positions of power in government and industry still pay close attention to financial journalism and public attitudes. Further, some research figures indicate that in 2021 97% of Australians over the age of 14 years read news from printed or online sources in a month, showing that despite the changes in the media landscape, news is still widely consumed.²¹ A more solutions focussed journalism could support all Australians' financial wellbeing through high quality reporting. The media could also shape public understanding and government policy by highlighting and unpacking important but poorly understood issues.

So, what are the important issues that some financial journalists are missing?

The literature tells us that men have traditionally been more financially involved in financial matters than women. Men think and plan more for their future financial security than women. Why is that? Research on women's financial wellbeing in Australia²² showed that women *would like* to focus on their financial security but the lack of resources and cognitive bandwidth (due to juggling multiple responsibilities and the associated mental load), and the impact of significant life events create barriers to women's ability to focus on their future.

Research by ANZ shows that 25% of women say they plan to put money aside for investment purposes. This contrasts with 34% of men.¹⁸ Women are also much less likely to have savings compared to men, 17% of women say they have no savings at all, compared with 10% of men.¹⁸ These are some of the trends that drive a disparity in financial wellbeing between men and women. Media could focus on the contexts that sit behind these figures rather than view these disparities in isolation of gender inequality, pay gaps and unbalanced caring responsibilities.

There is also some evidence to show that women – especially millennial or younger women – will choose different ways to engage with financial information including social media influencers who have

tremendous reach but do not always provide high-quality information.²³ There is an opportunity for mainstream media to fill this gap – provide reliable financial information in a way that speaks to younger and women readers. A first step could include encouraging more female journalists to write for women on topics that interest (or are important to) women.

We also see a need to provide more nuanced coverage of financial abuse and family violence and its effect on the financial wellbeing of women, that goes beyond the current sensationalist reporting. The role that the divorce and separation play in women’s financial wellbeing also seems to have minimal coverage in media discussion. Similarly, the predominance of unpaid work that women undertake in our society also affects their ability to undertake paid work and their ability to accumulate superannuation and savings, and overall financial wellbeing. The media could devote more attention to how gendered expectations and social policies shape women’s and men’s caring and career choices and their subsequent financial wellbeing.

While there is some discussion of pensions in the media, social welfare and financial supports are a small topic of conversation compared to the big three – property, retirement and investments. There is lots of room for the financial media to report more on the financial wellbeing of a greater range of people in our communities, not just women and gender minorities, but First Nations people, cultural and racial minorities, people with disabilities, and many others. The healthiest economies are those in which all citizens enjoy financial wellbeing not just the wealthy.

In essence, if we only consider what is represented in the media, the investment and property ownership are the “end game” of financial wellbeing. The other areas of financial wellbeing, the antecedents to financial wellbeing are missing. The news media could make active editorial decisions to provide more coverage about how people who don’t have the means to play the stock or property markets, are constrained to unpaid or low paid work, can be supported in their financial wellbeing and bring greater awareness about what is needed from the government, industry and the community to make this possible.

Provocations

- How does the typical financial life trajectory for women differ from men and how does that influence their financial outcomes? Can we shape a better system of supports for women throughout their life and what role can the media play in that?
- Closing the gender pay gap will make a big difference to women’s financial wellbeing. What practical steps can we take to move towards a world where caring and family responsibilities are valued?

What's Next?

This big data analysis has shone a spotlight on how media reporting on financial wellbeing cuts to the essence of how we see ourselves. That the great Australian dream of owning a home sits at odds with the competitive society in which those who can prosper from home ownership increasingly rise above those who are seeking access to the housing market. This challenges our view of ourselves as a country of mates who will help each other out or that everyone can get a fair go.

This analysis also showed that the media plays an important role in providing trusted information when financial institutions are not. During the loss of trust in financial institutions that surrounded the Royal Commission and Inquiry of the 2010s, the media stepped up to help people negotiate complex financial decision making. But the media has not impacted the information needs of women and not only doesn't help to improve women's financial wellbeing, it also misses the critical financial and social issues associated with financial abuse and family violence.

Financial wellbeing is interdependent with other critical wellbeing issues we are facing in Australia. It connects to housing and homelessness, poverty, skills development and training. These are all vitally important challenges that we are dedicated to working on in the Social Innovation Precinct that RMIT is shaping in City North. We are seeking new collaborators who want to bring innovative mindsets to find new solutions together.

If you are inspired or provoked by this report, please reach out so that we can shape the next stage in this social innovation work together.

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Appendices

Appendix 1 – Full list of relevant topics from the model

Article Count	Topic Name	Housing and Property	Retirement	Investing
6	Macroeconomics			
110	Fund managers			x
74	Salary sacrificing into superannuation		x	
151	Retirement		x	
238	Bonds			x
104	Superannuation		x	
91	Investment management			
651	Credit cards and debt			
67	Australian stock market			x
1695	Property market	x		
52	Warren Buffett			
2816	Financial advisors			
441	Interest Rates			
564	Executive remuneration			
1279	Bank fees and rates			
1534	Houses and property listings	x		
3834	Pensions and social security payments			
1297	Superannuation		x	
665	Workplace gender equality			
11527	Investing			x
4896	Mortgages	x		
1586	Art markets			
1646	Divorce and family legal affairs			
3520	Property Investing	x		
2955	Payments and fintech			
1681	Trusts and lending			
450	Food and cooking			
2443	Health care			
1175	Aged Care			
1322	Technical investment advice			
1390	Financial scams			
1134	Inheritance and family legal affairs			
7072	First homebuyers	x		

981	Renewable energy		
974	Index funds		x
2522	Self-managed super funds	x	
2387	Water bills and water infrastructure		
2926	Life insurance		
640	Criminal law		
505	Transport		
3230	Trusts		
7326	Annuities		
2299	Housing	x	
993	International markets		
4759	Lost superannuation accounts	x	
1343	Billionaires		
9697	Mini trading warrants		x
5779	Technical investing advice		
1190	Stock warrants (options)		x
733	Ethical investing		x
1478	Gold price		x

Appendix 2 – Data process and methodology

At the end of 2022, we used the Factiva Analytics service to download all the English language media coverage in their database with the tags “personal finance” or “family finance”²⁴ from January 1990 to December 2022. This yielded 1,510,798 articles that Factiva had tagged with either one of these topics. The data drawn from Factiva includes the heading and full text of each article, along with an assortment of metadata including publication date, author, publication name and much more.

Focusing on Australia, we created our final data set of 114,739 articles by removing material from other countries. We know that there is some error in the labelling of articles and some material in the dataset is not about personal or family finance. However, having some irrelevant articles in the data set does not pose a major problem for the topic modelling methodology that we have used. Some topics produced by the model were irrelevant, but this does not hinder interpretation of the remaining topics.

Topic modelling

Having extracted the data and prepared it for analysis, we used a topic modelling approach called Latent Dirichlet Allocation (LDA)²⁵ to identify latent topics in the corpus of text that is our data set. LDA is a commonly used natural language processing algorithm for identifying a set of meaningful topics within a large corpus of text. It finds words that frequently cluster together and creates topics out of them, modelling each document as a cluster of topics and each topic as a cluster of words.

Data Cleaning

Before starting our analysis, we cleaned the data and organized it in a suitable format for our topic modelling algorithm. The data cleaning steps were:

- Converting each article in the data set into an unstructured set of words. Each article simply becomes a list of all the words in that article with no word ordering, sentence structure or syntax.
- Removing the most common and least common words. Words that are extremely frequent (mostly prepositions, pronouns etc....) are not useful in explaining the difference between articles and nor are words that appear in only a very small number of articles.
- The remaining words are then lemmatized, a process which reduces them to their root. For example, lemmatization reduces “driving”, “driver” and “drives” to their root word “drive.” All these words will then be treated as the same word in the final analysis.

As well as individual words, ordered pairs of words (bi-grams) and ordered triplets (tri-grams) were also included in the model. For example the term “self employed” is lemmatized and included in the model as the bi-gram “self-employ”, which the algorithm treats in the same way as other words.

In the exploratory phase of our research, we prepared topic models with 20, 40 and 60 topics. We found the topics in the 60-topic model to be more distinct and meaningful and the results from this model form the basis of our findings in this report.

Once the topics are identified the final step is to assign each article to a topic. A prediction algorithm is used to estimate the probability that an article belongs to a given topic, matching the words in the topic with those in an article. Each article is assigned to one topic, which the prediction algorithm gives the highest probability.

Interpretation

The output from this process was a set of key words and articles that best represented each topic. Labelling the topics required the research team to look at the words in the topic and review sample articles that had been assigned to that topic. This was an inherently subjective process that required the team to collaborate and build a consensus around the meaning of each topic. Our project team included subject matter experts on financial wellbeing and journalism who helped to ensure that subtle meanings were not missed.

Predicting author gender

To shed light on the gendered dimension of financial wellbeing reporting, we have used an algorithm to predict the binary gender of authors. The algorithm takes the author's first name as an input and, for men and women, predicts their gender accurately more than 90% of the time. This allows us to label each article with the gender of the lead author, and, subsequently, assess whether men and women authors are more likely to focus on different topics when discussing financial wellbeing.