

# All-Actuaries Summit

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2-4 May  
2022

Melbourne Convention  
and Exhibition Centre  
(Hybrid Event)



**Actuaries  
Institute**



# **Corporate Mortality: an actuarial reflection**

## **Douglas Isles & Cary Helenius**

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# WMSC Working Group

- This presentation is the output of a volunteer working group, under the WMSC (Wealth Management Sub-Committee) of the SPC.
- The non-presenting members of the group, whose efforts are reflected in here are: **Luv Bhatnagar, Tyrone Louw and Felix Sun**
- We are keen to recruit people working in Investment Management to get more involved in the Profession via the WMSC.

# The irony

- Corporates are perpetual entities
- Corporates are collections of humans
- Corporates have much shorter expected lifespans than humans

# Agenda

## Douglas

- Brief look at some literature
- CABEE data – Australian corporates

## Cary

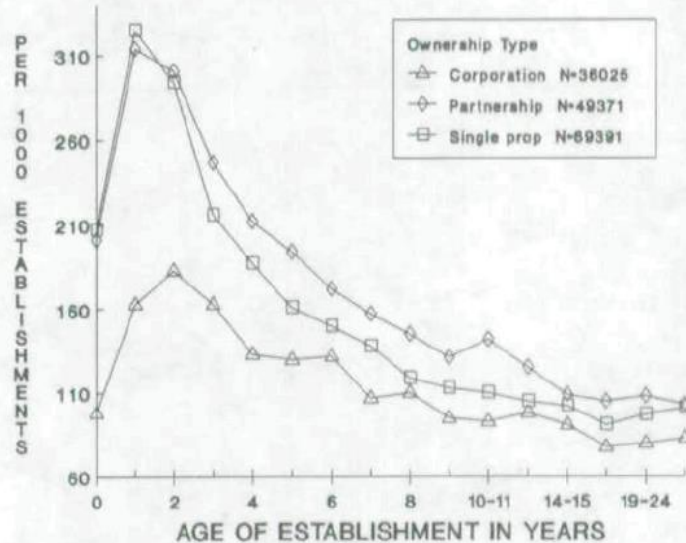
- ASX 200 – “index mortality”

# Selected literature

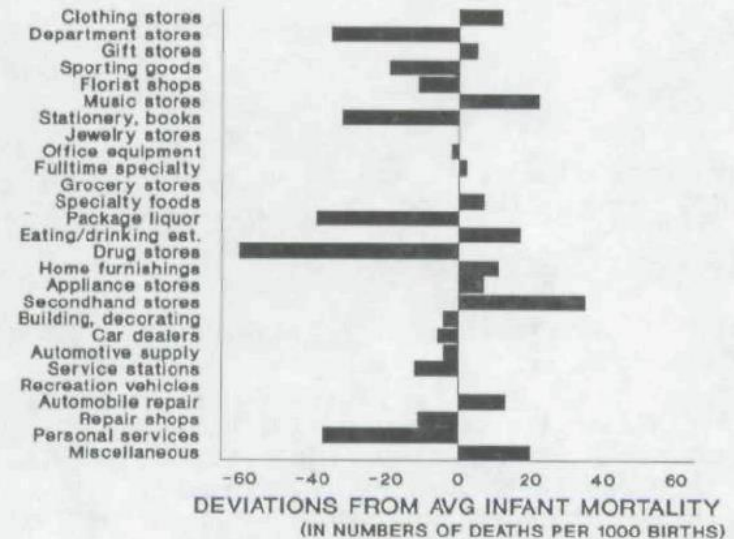
- “Population demography of organisations”, King & Wicker
- “Strategy when creative destruction accelerates”, Govindarajan & Srivavasta
- “Demography of corporations and industries”, Carroll & Hannan
- “The Living Company”, de Geus

# Californian Retail Businesses

Age-Specific Death Rates for Retail and Service Establishments Having Different Forms of Ownership

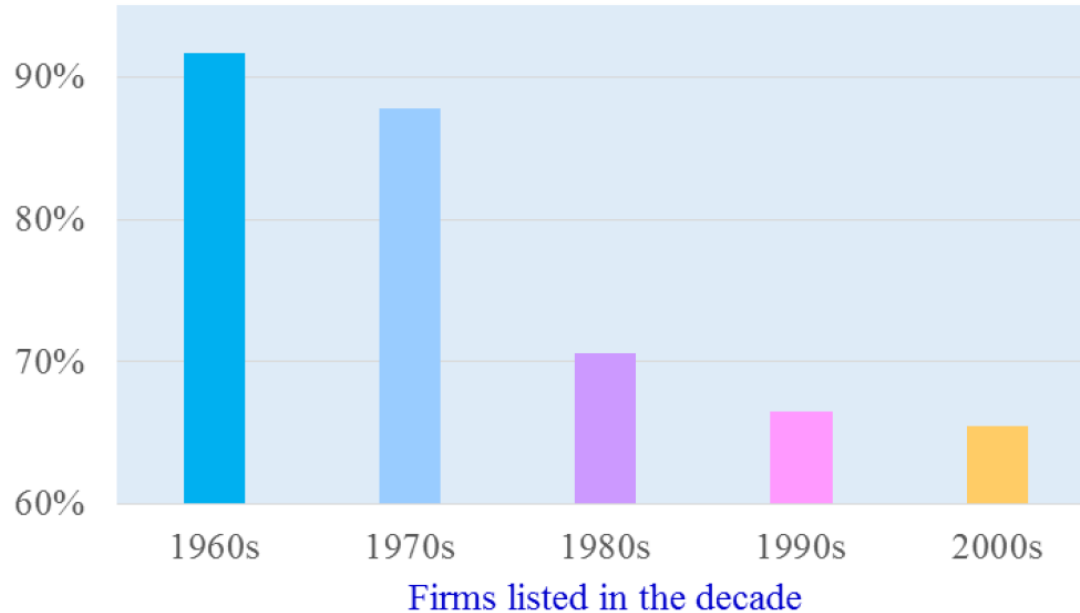


Deviations from Average Infant Mortality Rate for Various Types of Retail and Service Establishments



Source: "Population demography of organisations", King & Wicker

# 5yr survival rates post-listing



Source: Strategy when creative destruction accelerates, Govindarajan & Srivavasta

# Annual lost NYSE share by pre-1935 cpys

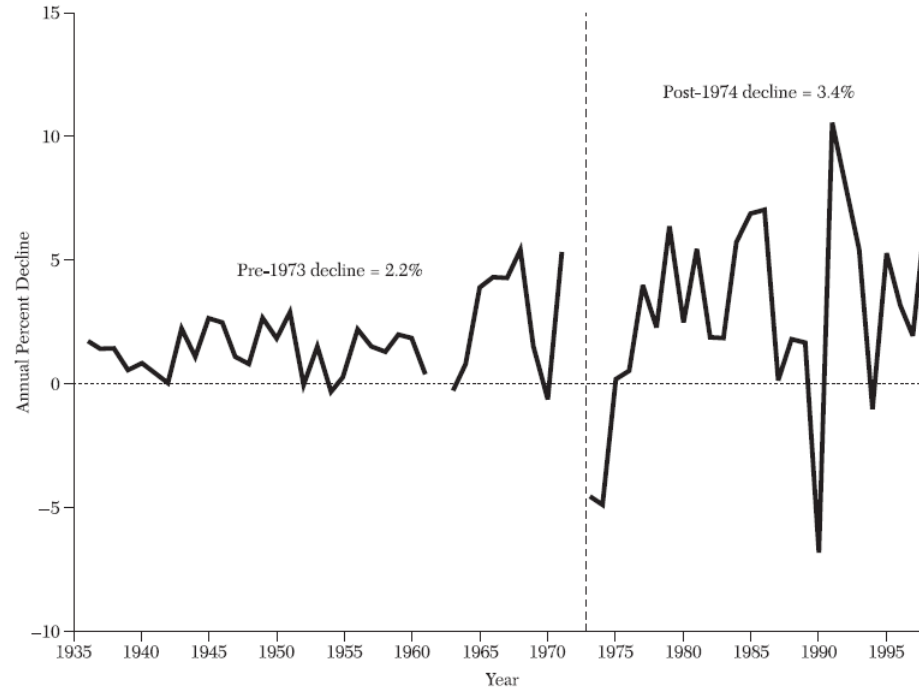


Figure 5. Aging and Value-Loss in the Stock Market

Source: "Demography of corporations and industries", Carroll & Hannan

# Attributes of long-lived companies

- Sensitive to their environment (learn/adapt)
- Cohesive; strong sense of identity/ community
- Tolerant (aka decentralised); build constructive relationships
- Conservatively financed

# Current backdrop

- Start-ups (“births”) fuelled by easy money
- ASX dominated (by value) by old companies: tortoise v hare?
- Long time between recessions – credit spreads low, suggests low expected “deaths” (ex M&A, etc)

# What is CABEE?

- ABS data – Counts of Australian Businesses, Entries and Exits
- Published annually

# CABEE dataset

- 2.4m businesses in Australia at 30.6.21
- 365k formed in prior 12 months
- 1.0m businesses are employing
  - Of which, 60,000 have 20+ employees
- 175k businesses have \$2m+ turnover
- Data on state, industry, legal structure
- We now have millions of cells in a spreadsheet

# CABEE : High Level

| Year | Entry (%) | Exit (%) | Pop'n Gr. (%) | "Life Exp" |
|------|-----------|----------|---------------|------------|
| 2010 | 16.7      | 13.1     | 3.6           | 7.6        |
| 2011 | 13.9      | 13.5     | 0.4           | 7.4        |
| 2012 | 13.5      | 13.1     | 0.4           | 7.6        |
| 2013 | 11.2      | 14.1     | -2.9          | 7.1        |
| 2014 | 13.7      | 12.7     | 1.0           | 7.9        |
| 2015 | 13.4      | 12.4     | 1.0           | 8.1        |
| 2016 | 14.6      | 12.3     | 2.3           | 8.1        |
| 2017 | 15.1      | 12.0     | 3.1           | 8.3        |
| 2018 | 15.8      | 12.5     | 3.3           | 8.0        |
| 2019 | 15.4      | 12.7     | 2.7           | 7.9        |
| 2020 | 14.5      | 12.5     | 2.0           | 8.0        |
| 2021 | 15.8      | 12.0     | 3.8           | 8.3        |

Source: ABS, CABEE data, multiple years

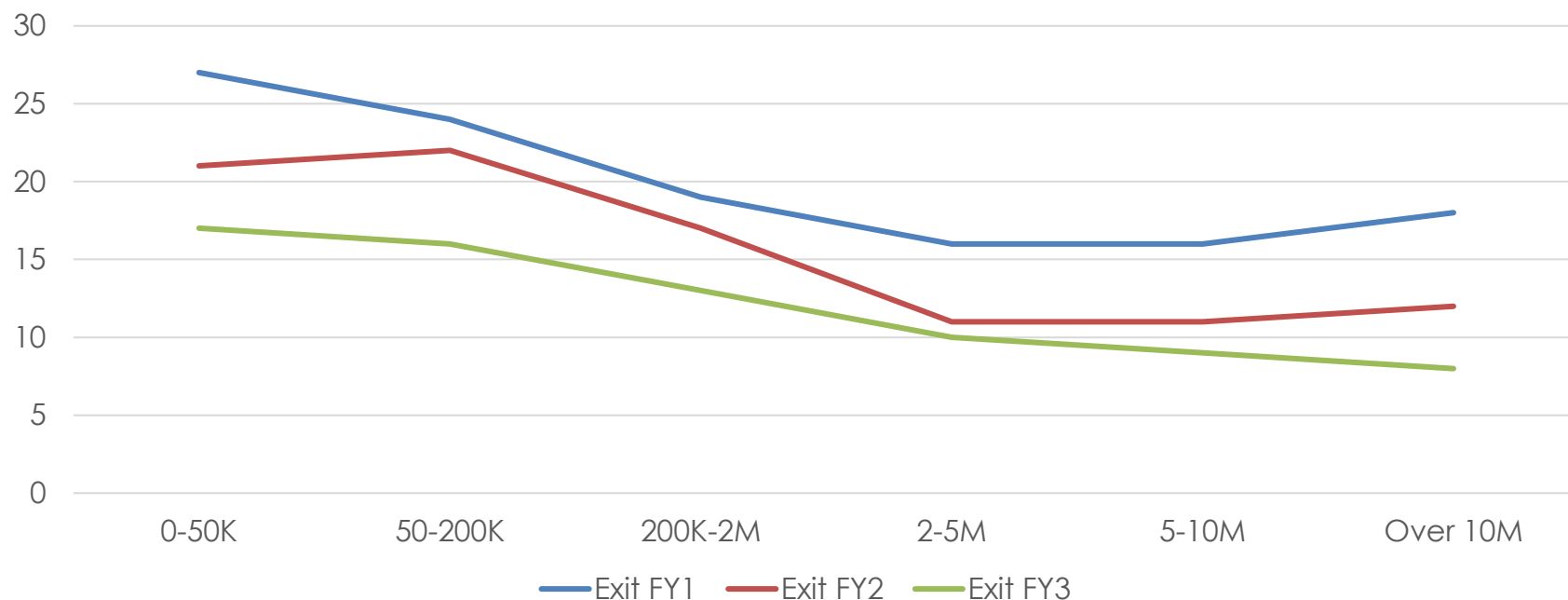
# CABEE: Age-based mortality (%)

| Year | Founded in Y-1 | Founded in Y-2 | Founded in Y-3 | Founded prior |
|------|----------------|----------------|----------------|---------------|
| 2011 | 27             | 20             | 14             | 9             |
| 2012 | 24             | 21             | 16             | 9             |
| 2013 | 26             | 22             | 18             | 10            |
| 2014 | 21             | 20             | 16             | 10            |
| 2015 | 21             | 19             | 16             | 9             |
| 2016 | 22             | 19             | 15             | 9             |
| 2017 | 22             | 19             | 14             | 9             |
| 2018 | 22             | 20             | 15             | 9             |
| 2019 | 24             | 20             | 15             | 9             |

Source: ABS, CABEE data, multiple years

# CABEE: Turnover-based mortality

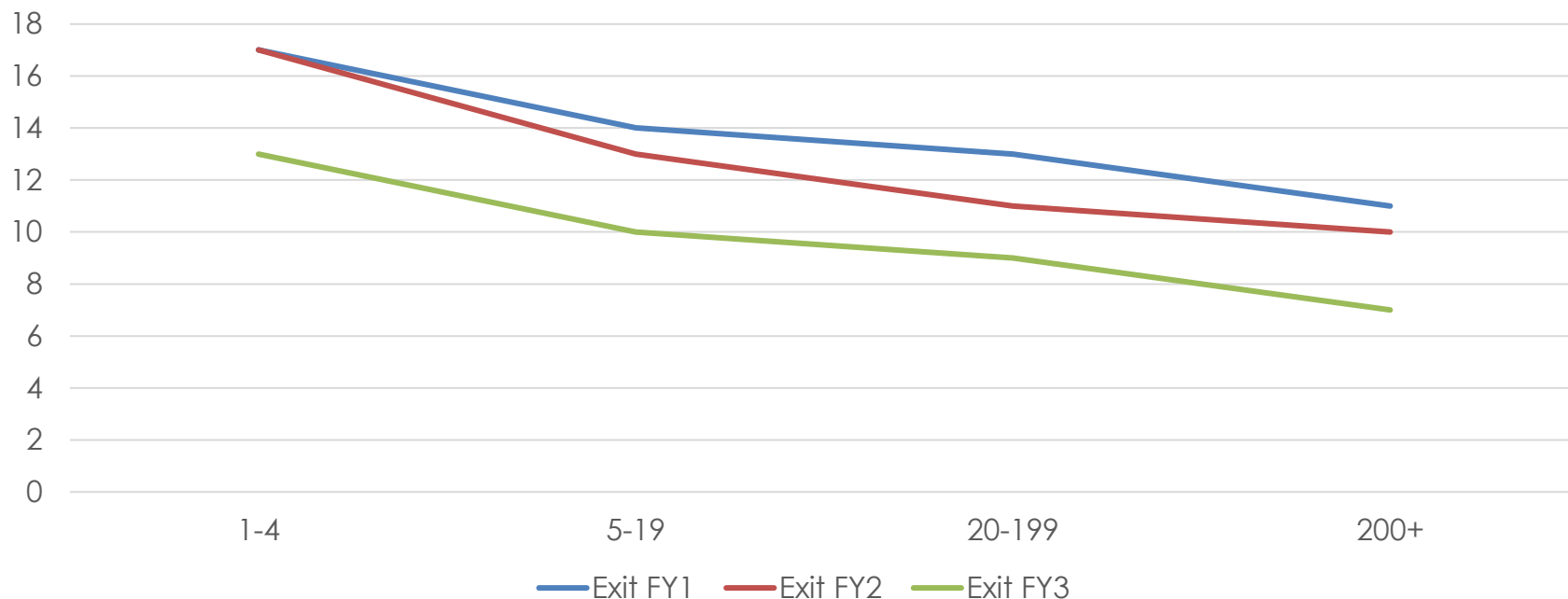
Average mortality for businesses formed FY0 = 2008-2018



Source: ABS, CABEE data, multiple years

# CABEE: Size-based mortality

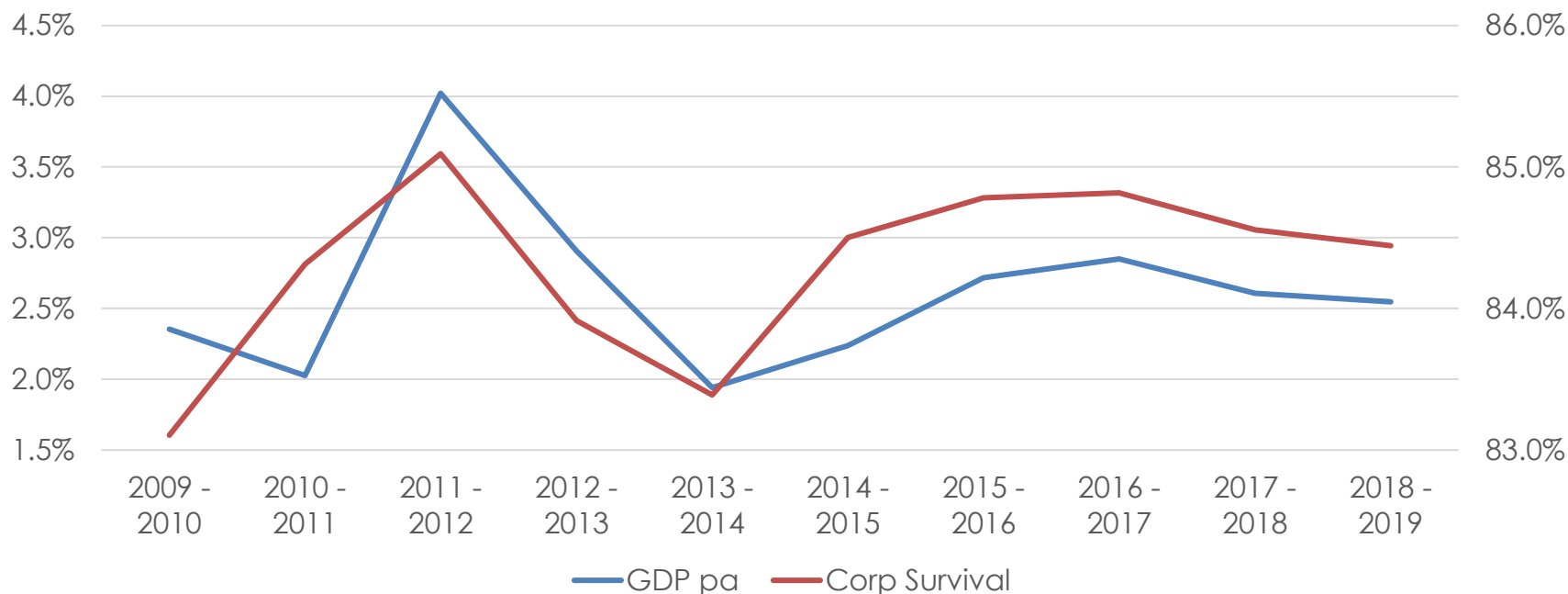
Average mortality for businesses formed FY0 = 2008-2018



Source: ABS, CABEE data, multiple years

# GDP Impact

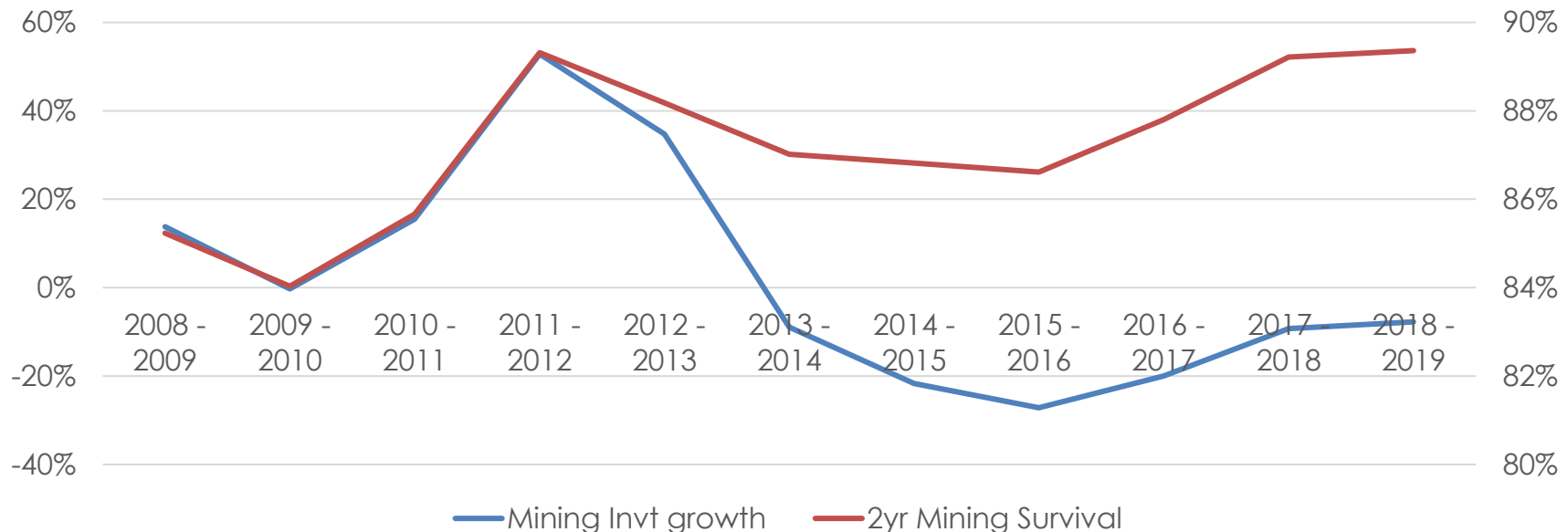
Australian GDP (LHS) v 2-year corporate survival (RHS)



Source: ABS, CABEE data, RBA

# Mining investment

Mining investment 2yr annual growth (LHS) v  
Mining business 2yr survival (RHS)



Source: ABS, CABEE data, RBA

# Retailers

Domestic Sales 2y growth (LHS) v Retail Trade 2yr Survival



Source: ABS, CABEE data, RBA

# Conclusion

- We have a large data set via CABEE
- We have just started to explore its potential
- We hope to recruit some people to take this further over the next few months

# Listed Company considerations

ASX listed companies are heavily impacted by sector based considerations:

## **Financial services:**

- heavily regulated and capitalized industry. dominated by Big 4 banks (+emerging mid-tier banks)
- regulation has potentially hampered growth
  - difficult for new market entrants
  - supported survival of the established financial organisations;

## **Technology:**

- Highly disruptive and diverse sector – generally scalable business models with limited barriers to entry
- Potential for high revenue growth but “Dot-com” bubble evidence of the investor speculation
- Most ASX 200 participants having less than 20 years of history

## **Materials:**

- China driven commodity boom (e.g. iron ore) has been the primary driver of Australian GDP growth
- Speculative mining primarily with early stage exploration companies contrasts with established producers
- Overall sector heavily impacted by geo-political landscapes.

Social license (ESG) becoming a key to Australian business survival as investors focus on “sustainable” organisations

# Some considerations

% contribution to Australian GDP (by sector)

| % of GDP | Mining | Manufacturing | Agriculture | Construction | Financial Services | Info media and telecom | Professional, scientific and technical services | Health care and social assistance | Retail and Wholesale Trade | Other |
|----------|--------|---------------|-------------|--------------|--------------------|------------------------|-------------------------------------------------|-----------------------------------|----------------------------|-------|
| Dec 76   | 5.2%   | 13.5%         | 3.8%        | 7.3%         | 4.0%               | 0.6%                   | 3.2%                                            | 4.1%                              | 8.5%                       | 49.8% |
| Dec 81   | 4.8%   | 13.3%         | 3.6%        | 7.2%         | 4.0%               | 0.8%                   | 3.5%                                            | 4.3%                              | 8.1%                       | 50.4% |
| Dec 86   | 5.5%   | 11.5%         | 3.3%        | 6.2%         | 5.5%               | 1.0%                   | 3.9%                                            | 4.7%                              | 7.3%                       | 51.0% |
| Dec 91   | 7.5%   | 10.9%         | 2.9%        | 5.7%         | 6.1%               | 1.3%                   | 4.4%                                            | 5.2%                              | 7.1%                       | 48.8% |
| Dec 96   | 7.5%   | 10.2%         | 3.5%        | 5.7%         | 6.3%               | 1.6%                   | 4.7%                                            | 5.2%                              | 7.6%                       | 47.7% |
| Dec 01   | 7.1%   | 9.4%          | 3.4%        | 5.7%         | 6.9%               | 1.7%                   | 5.5%                                            | 5.4%                              | 7.8%                       | 47.1% |
| Dec 06   | 7.0%   | 8.5%          | 2.5%        | 7.6%         | 7.9%               | 1.8%                   | 5.5%                                            | 5.4%                              | 8.0%                       | 45.8% |
| Dec 11   | 7.6%   | 7.4%          | 2.9%        | 8.3%         | 7.6%               | 1.9%                   | 6.1%                                            | 5.9%                              | 7.9%                       | 44.4% |
| Dec 16   | 9.4%   | 5.9%          | 2.8%        | 7.5%         | 7.8%               | 2.0%                   | 6.6%                                            | 6.5%                              | 8.1%                       | 43.4% |
| Dec 21   | 9.5%   | 5.6%          | 2.9%        | 7.0%         | 7.6%               | 2.3%                   | 7.3%                                            | 7.9%                              | 8.2%                       | 41.8% |



Growth in economy has been driven by changing geo-political landscapes / commodity booms (impacting mining), rise in the disruptive technology sector, growth in financial services / health care and reduction in the contribution from manufacturing - all contributing to the companies in these sectors

# Index composition

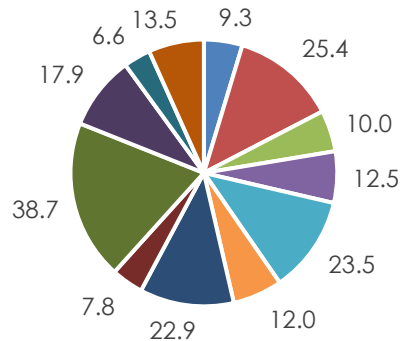
|                        | ASX 200    | All Ordinaries | Broader Listed companies |
|------------------------|------------|----------------|--------------------------|
| Materials              | 41         | 121            | 778                      |
| Financials             | 29         | 62             | 254                      |
| Healthcare             | 14         | 46             | 186                      |
| Consumer discretionary | 23         | 62             | 138                      |
| Communication Services | 11         | 25             | 67                       |
| Consumer Staples       | 13         | 23             | 80                       |
| Real Estate            | 24         | 48             | 80                       |
| Industrials            | 17         | 39             | 167                      |
| Energy                 | 9          | 24             | 141                      |
| Information Technology | 16         | 46             | 191                      |
| Utilities              | 3          | 4              | 22                       |
| <b>Total</b>           | <b>200</b> | <b>500</b>     | <b>2104</b>              |

On the listed market:

- Nearly half the combined profits and dividends are from Big 4 banks (+Macquarie), BHP, RIO, Wesfarmers, Woolworths, Telstra – companies over 50 years old.
- Increasing number of emerging / mid-market financial companies (payment based organisations, platform providers, fund managers)
- Outside of the ASX 200, broader index has a series of (i) speculative mining stocks, (ii) speculative technology stocks, (iii) speculative bio-tech

# Characteristics of the ASX 200

Average number of companies in the ASX 200  
by sector: **Mar 2011 – Dec 2021**



- COMMUNICATION SERVICES
- ENERGY
- INDUSTRIALS
- REAL ESTATE
- CONSUMER DISCRETIONARY
- FINANCIALS
- INFORMATION TECHNOLOGY
- UTILITIES
- CONSUMER STAPLES
- HEALTH CARE
- MATERIALS
- NA

Focussing on the ASX 200 over the 44  
quarters from March 2011 to  
December 2021

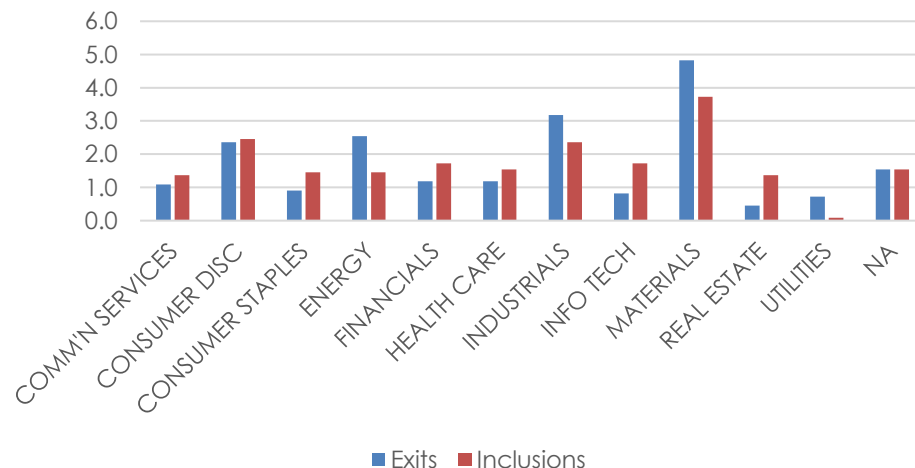
Average market cap \$7.95 bn

Largest segments are Materials (38.7),  
Consumer Discretionary (25.4),  
Financials (23.5) and Industrials (22.9)

20.8 index changes occur on  
average per annum

# Characteristics of the ASX 200

Yearly Exits vs Inclusions



398 unique companies over the 11 year period

229 total exits and 229 total inclusions, made up of:

- 198 new unique entries, with
- 31 companies exiting and re-entering

102 companies of the original 200 remained at the end of the period (7 exited and re-entered)

98 new entries remain in the ASX 200 at the end of the period (24 exited and re-entered)

Average age was ~10 years since listing on entry, and ~14 years since listing on exit

7 sectors increased in representation over the period; Materials, Industrials, Energy and Utilities had net declines in representation

# ASX Index Mortality

- What are the characteristics of companies that are dropped from the ASX 200 index
  - A corporate health check
  - More akin to morbidity than mortality
    - Can survive outside the index
    - A few instances of re-instatements
- The companies exiting the index includes a small number that were removed due to take-over or mergers, and it is likely that their characteristics will differ from those that were removed due to poor health
- Our hypothesis was that health of ASX listed corporates was related to their financials
- One of the most commonly used financial data that applies across all industry sectors is the cashflow statements
- We examined the cashflow statement data for companies that exited vs those that entered the index

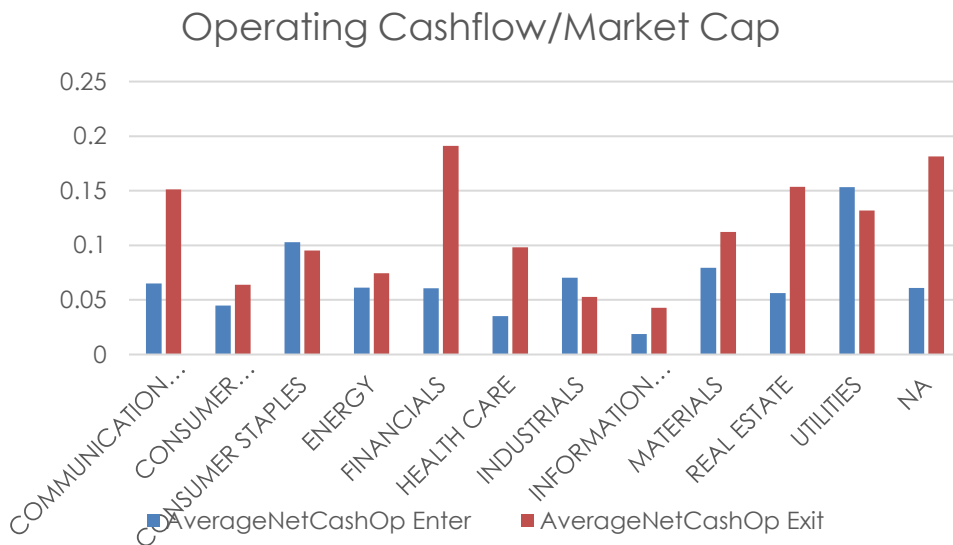
# Components of the cashflow

- It is a statutory requirement for all ASX listed companies to provide published accounts in a standardised format
- Not all companies have meaningful income statements of profit and loss (eg explorers, biotech and IT start-up businesses) and balance sheets can vary widely between sectors
- The cash flow statements cover all aspects of the company financials and can be reasonably compared across sectors and businesses

| Operating Cash                        | Investment Cash                                 | Financing Cash               |
|---------------------------------------|-------------------------------------------------|------------------------------|
| customer receipts                     | Property, plant and equip                       | proceeds from equity raising |
| payments to suppliers and employees   | exploration                                     | proceeds from borrowing      |
| dividends from associates/investments | payments for mines and development              | repayment of borrowing       |
| interest received                     | proceeds from PP&E                              | repayment of leases          |
| borrowing costs                       | Proceeds from sale of businesses and associates | dividends paid               |
| income tax                            | acquisition of subsidiaries (net of cash)       |                              |
|                                       | other financial assets                          |                              |

# ASX 200: entering vs exits by sector

Period from March 2011 to December 2021 was analysed (44 quarters)



We focussed on stocks that entered in the period vs those that exited the index

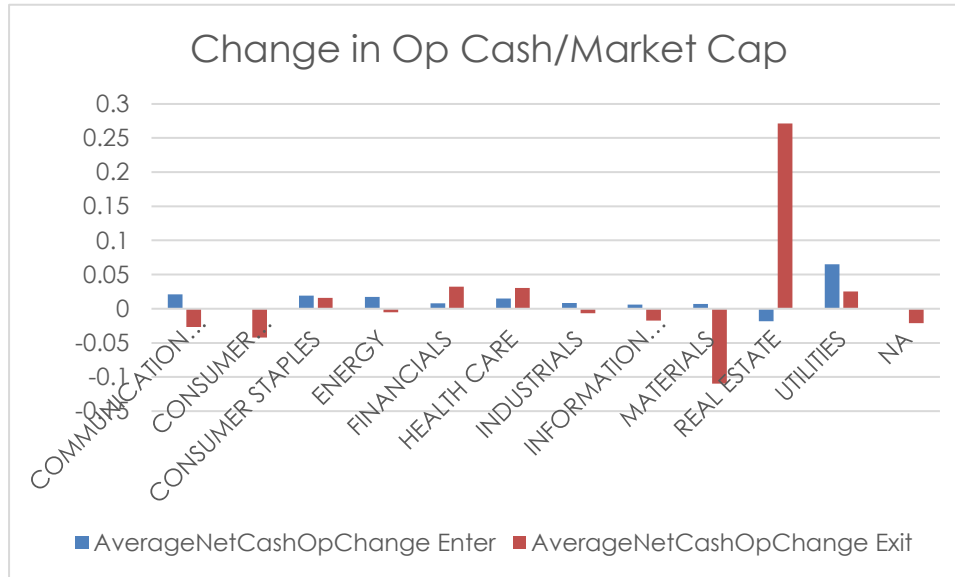
Cashflows were normalised by dividing by market caps – may distort some ratios on exiting stocks vs stocks remaining in index

Surprisingly 9 of 12 sectors had higher operating cashflow ratios on exit vs those which entered an exited in the period

Dividing by market cap inflates the ratios for exiting stocks compared to entering stocks

Includes some M&A activity amongst the exits

# ASX 200: entering vs exits by sector

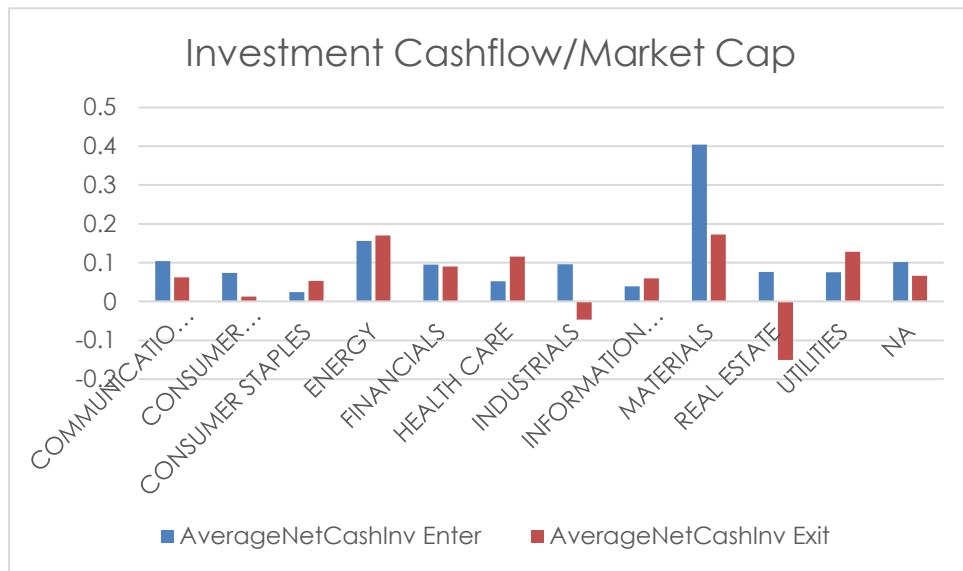


Change from the operating cashflow 12 months previous is a more significant indicator

9 of 12 sectors showed a lower or more negative change in operating cashflow compared to sector peers that stayed in the index

Representing a deterioration over the 12 months in either customer receipts, or increases in operating expenses or borrowing costs

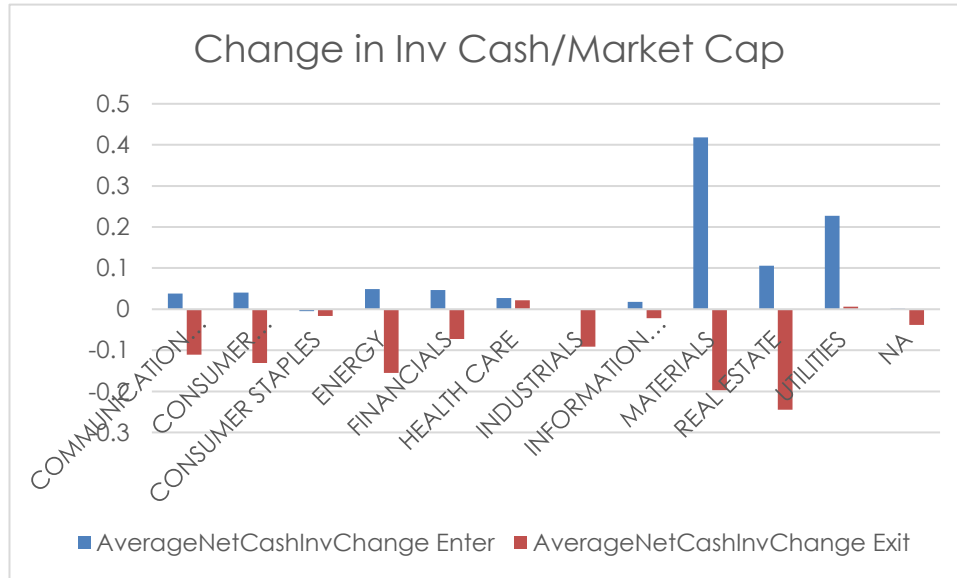
# ASX 200: entering vs exits by sector



Investment cashflows ratios were lower in 7 of 12 sectors for the exiting companies

Lower investment cashflow suggests lower capability to fund on going requirements of PPE, or exploration or major business development

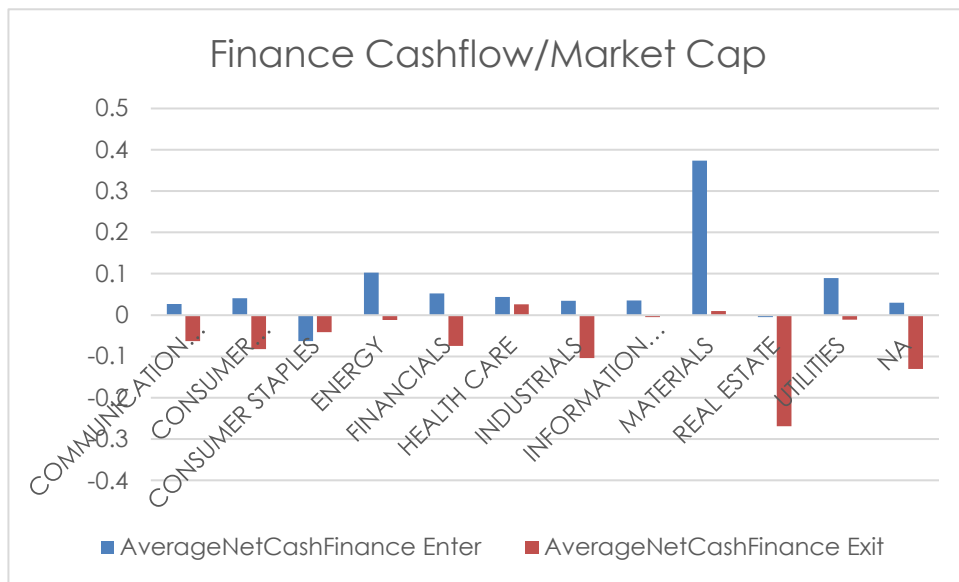
# ASX 200: entering vs exits by sector



All of the 12 sectors showed a more negative change in investment cashflow, with 10 of the sectors showing a negative change in Investment Cashflow

A more negative change investment cashflow shows a deterioration in the level of investment cash available to the company compared to the position in the previous corresponding financial statements

# ASX 200: entering vs exits by sector

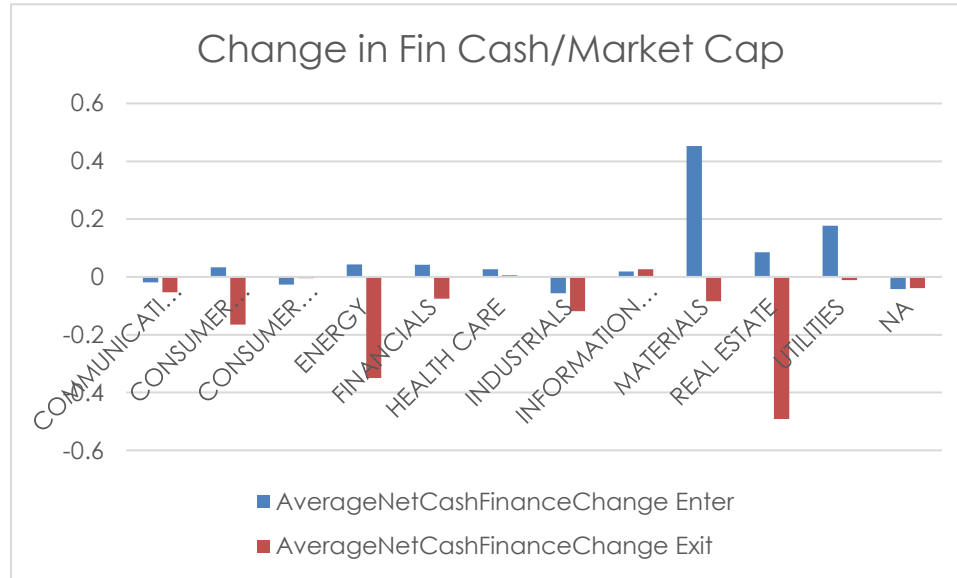


Financing cashflows ratios were lower in 9 of 12 sectors on exit vs entry

10 sectors were negative on exit vs 10 which were positive on entry

Representing a lower ability (or requirement) to raise new equity or debt to fund growth in the business in these companies, and a significant repayment of equity or debt in the exiting companies

# ASX 200: entering vs exits by sector

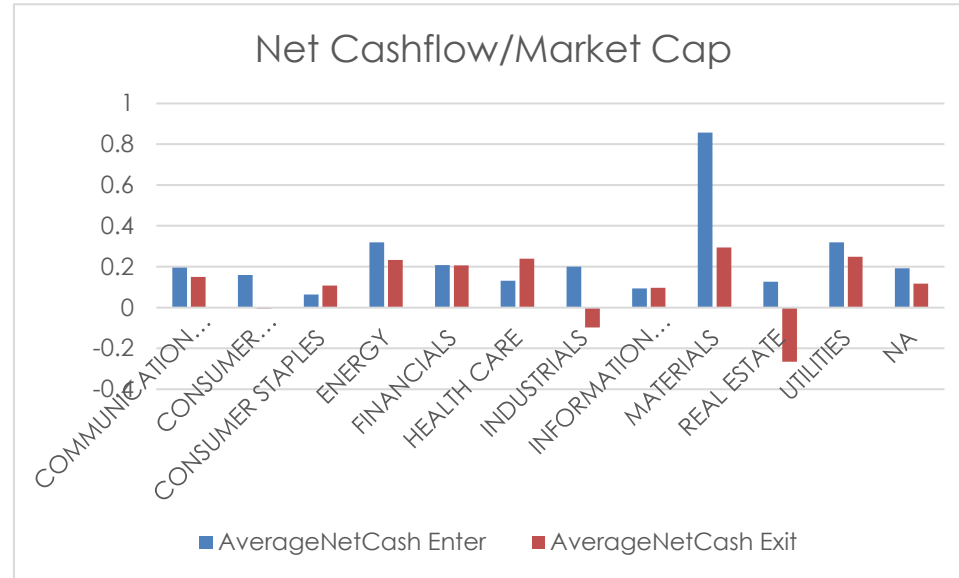


Change in Financing Cashflow were lower in 9 of the 12 sectors for exiting vs entering companies

10 of the 12 sectors had negative changes in financing cashflow on exit vs 8 sectors which were positive on entry

Representing a decline compared to the previous corresponding period in the level of equity or debt to fund growth in the business in the exiting companies

# ASX 200: entering vs exits by sector

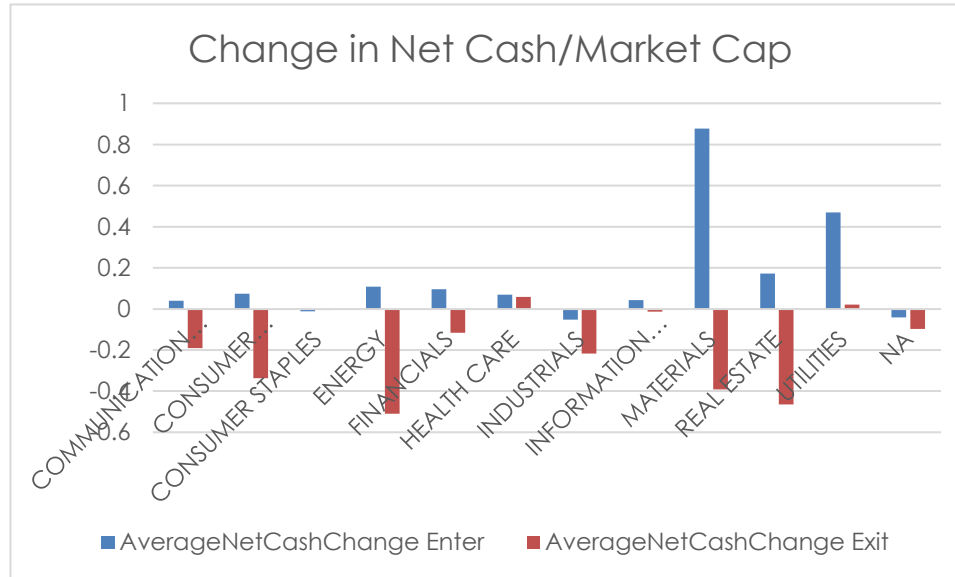


Aggregate cashflow ratios are a better indicator

This represents the sum of the operating cash flow, the investment cash flow and the financing cash flow in the cashflow statements

It was lower in 9 of 12 sectors for exiting companies compared to those that entered and stayed in the index

# ASX 200: entering vs exits by sector

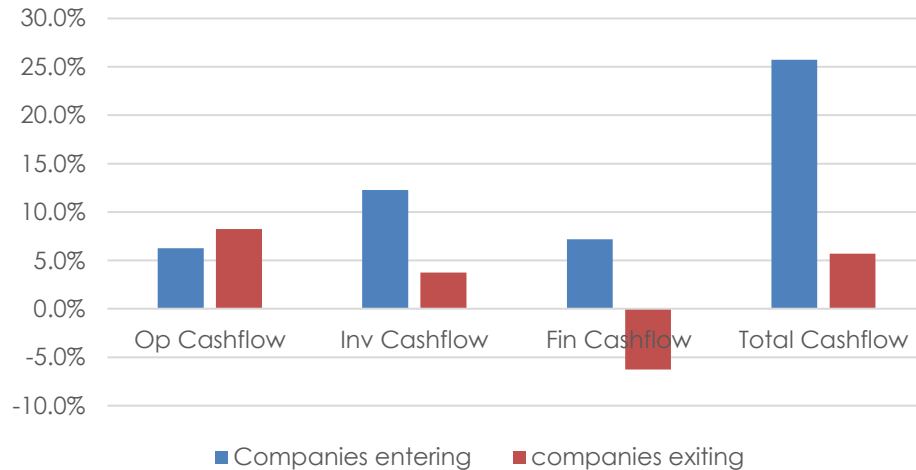


The change in total cash flows was significantly lower in 11 of the 12 sectors

10 of the sectors had a negative change prior to exit vs 9 sectors which had a positive change on entry in the index

# ASX 200: Companies entering vs exits

Average Cashflow Comparison

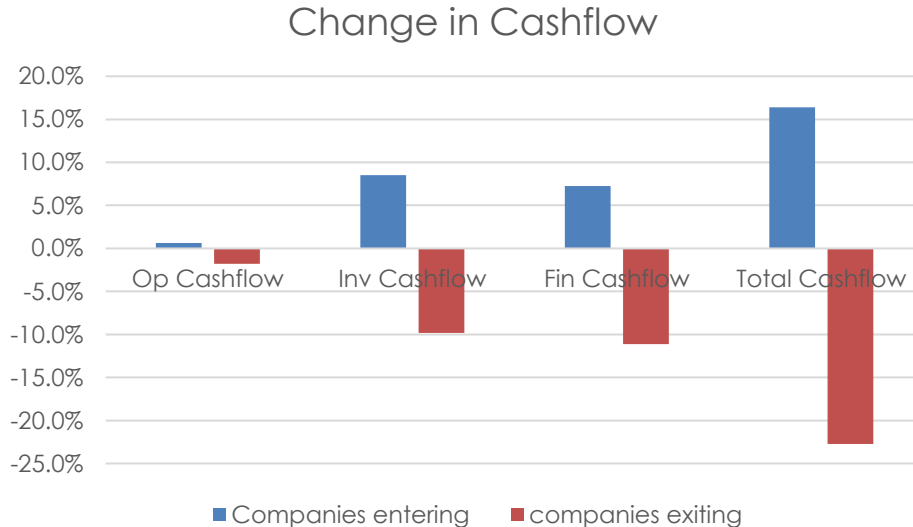


To obtain a larger sample size we aggregated the 229 inclusions and exclusions across all sectors

Companies entering had average market cap of \$1.9bn vs \$1.7bn for exits so are reasonably comparable

The ASX 200 exits had lower cashflow ratios on all metrics except Operating Cashflow

# ASX 200: Companies entering vs exits



A clearer and more compelling picture emerged when looking at **average 12 month changes** in the cashflow components in aggregate

The ASX 200 **Exits** on average had significant **declines for all** cashflow measures compared to previous 12 months

In comparison the companies **entering** show **positive changes** on average on all measures

# ASX Index Mortality

- The analysis suggests that accounting data, particularly cashflow statements, are a useful in assessing corporate health, and a significant contributor to index inclusions and exclusions
- **The results suggest a deterioration in a listed companies ability to produce cash, or raise additional cash from investors and bankers, to support the business (ie severe cashflow deterioration) can be extrapolated across all sectors as a primary cause of 'death' (or at least the removal from the ASX 200 index)**

Further work:

- Normalisation of data is important – using market capitalisation may cause some distortions, an alternative may be to normalize by weighting by total balance sheet assets
- Clearer signals are likely to be observed if companies leaving the index due to M&A activity were excluded from the data set

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(Hybrid Event)



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