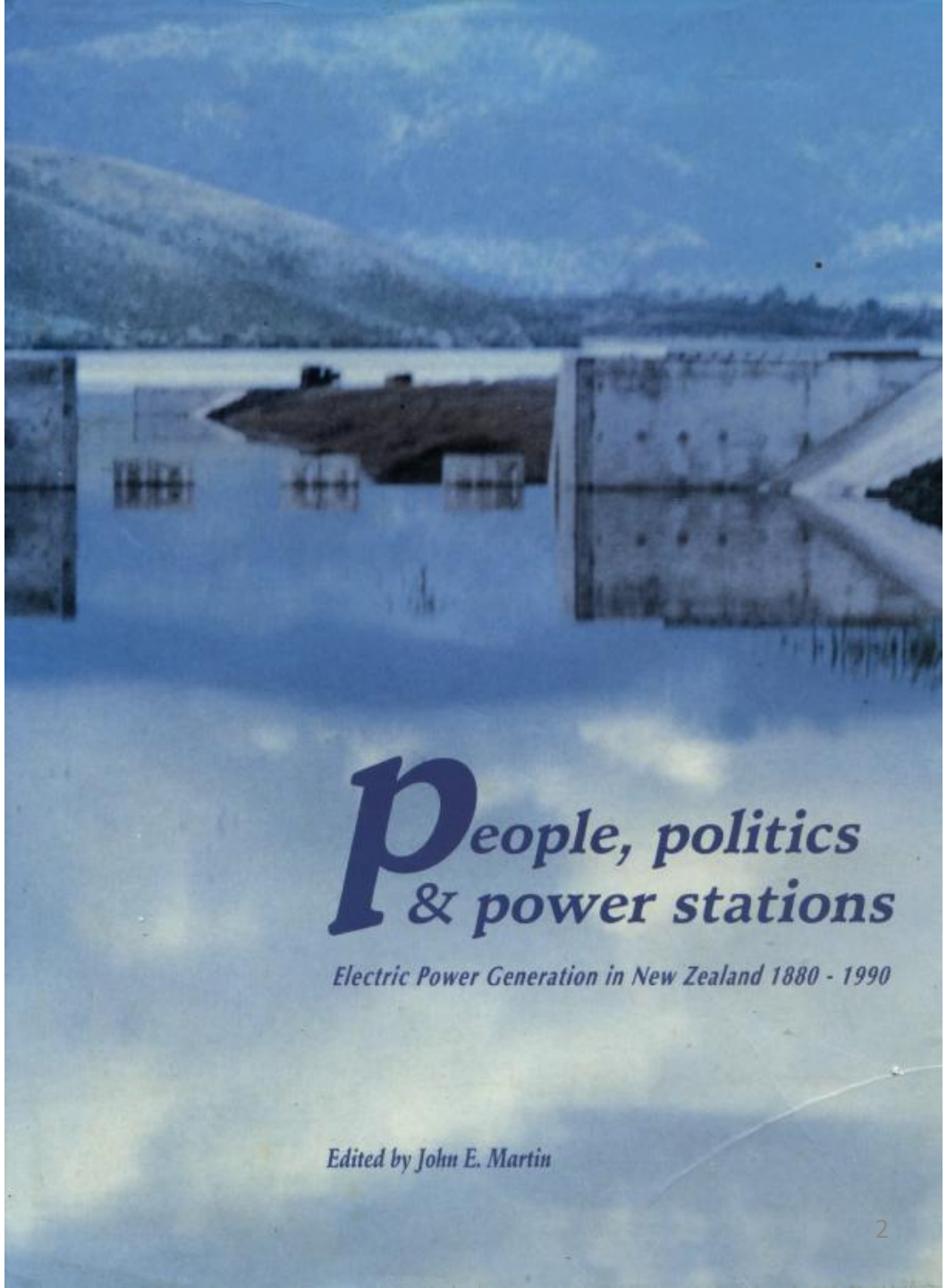
Electricity prices and profits

U3A lecture

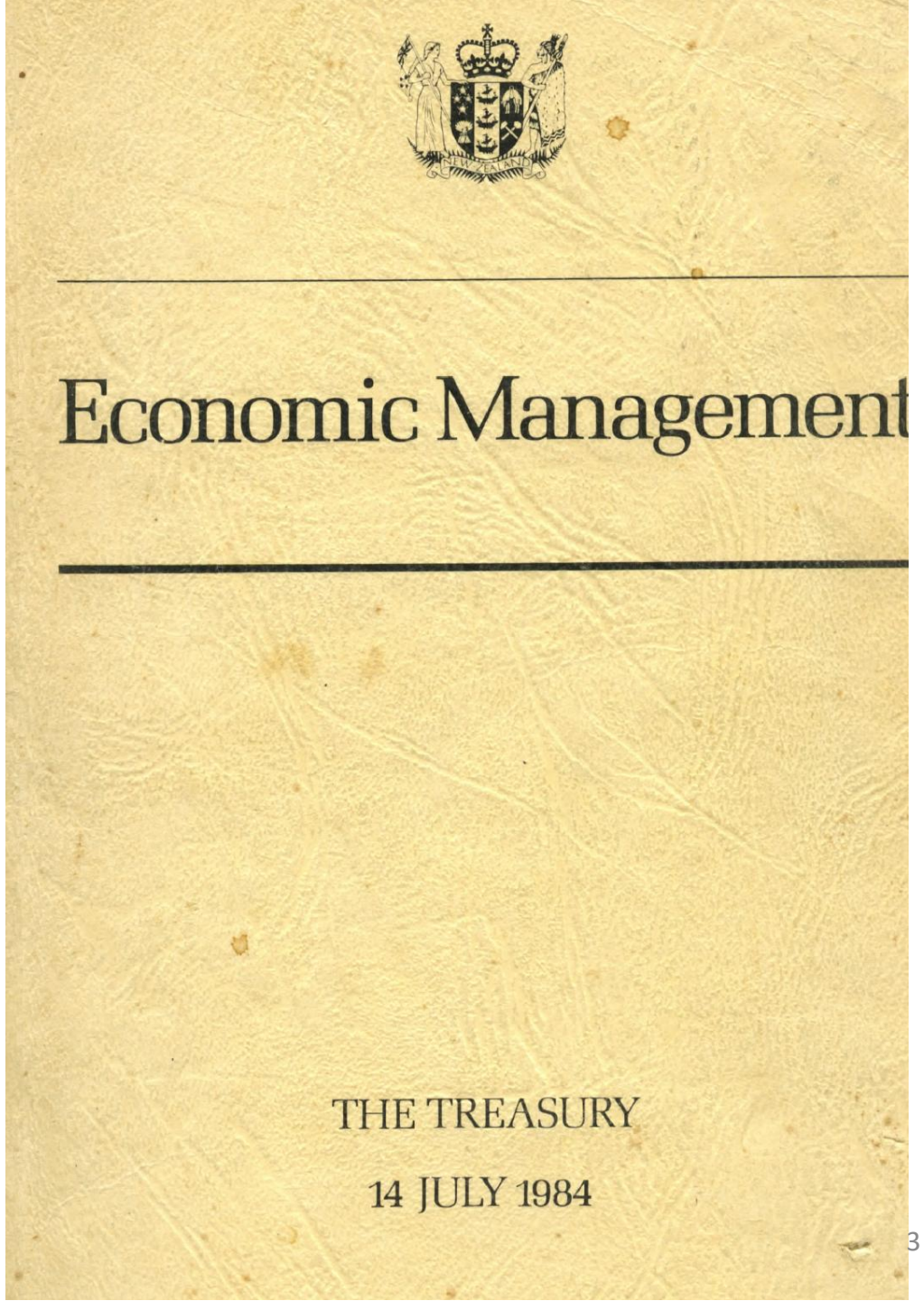
Geoff Bertram

May 31 2019

Electricity history up to the mid-1980s made a great book:



But in 1984 a dull-looking official paper changed everything:



Before 1984

- An “essential service” collectively provided
- Priced as cheaply as possible to households (average cost)
- Run by civil engineers committed to optimal planned outcomes
- Integrated monopoly with non-profit objectives

Since 1984

- A commodity allegedly like any other supplied by corporates
- Priced to recover the full cost of the marginal producer (marginal cost)
- Run by corporate managers and financial engineers maximising profit and “shareholder value”
- Multiple players in a complicated institutional landscape of some [allegedly] “competitive” and some [allegedly] “regulated” markets

1987 Corporatisation => profit-driven SOE (ECNZ)

1988 Transpower grid separated from generation stations (finally divested 1994)

1989 Taskforce recommends privatisation, “light handed regulation”

1994 Local electricity supply authorities corporatised and stripped of their retail franchise monopolies

1996 Wholesale spot market set up, Contact Energy spun off from ECNZ

1999 ECNZ broken up => SOEs Meridian, Genesis, Mighty River and private Trustpower and Todd

1999 Local lines/energy split enforced and generators allowed to buy up retail businesses

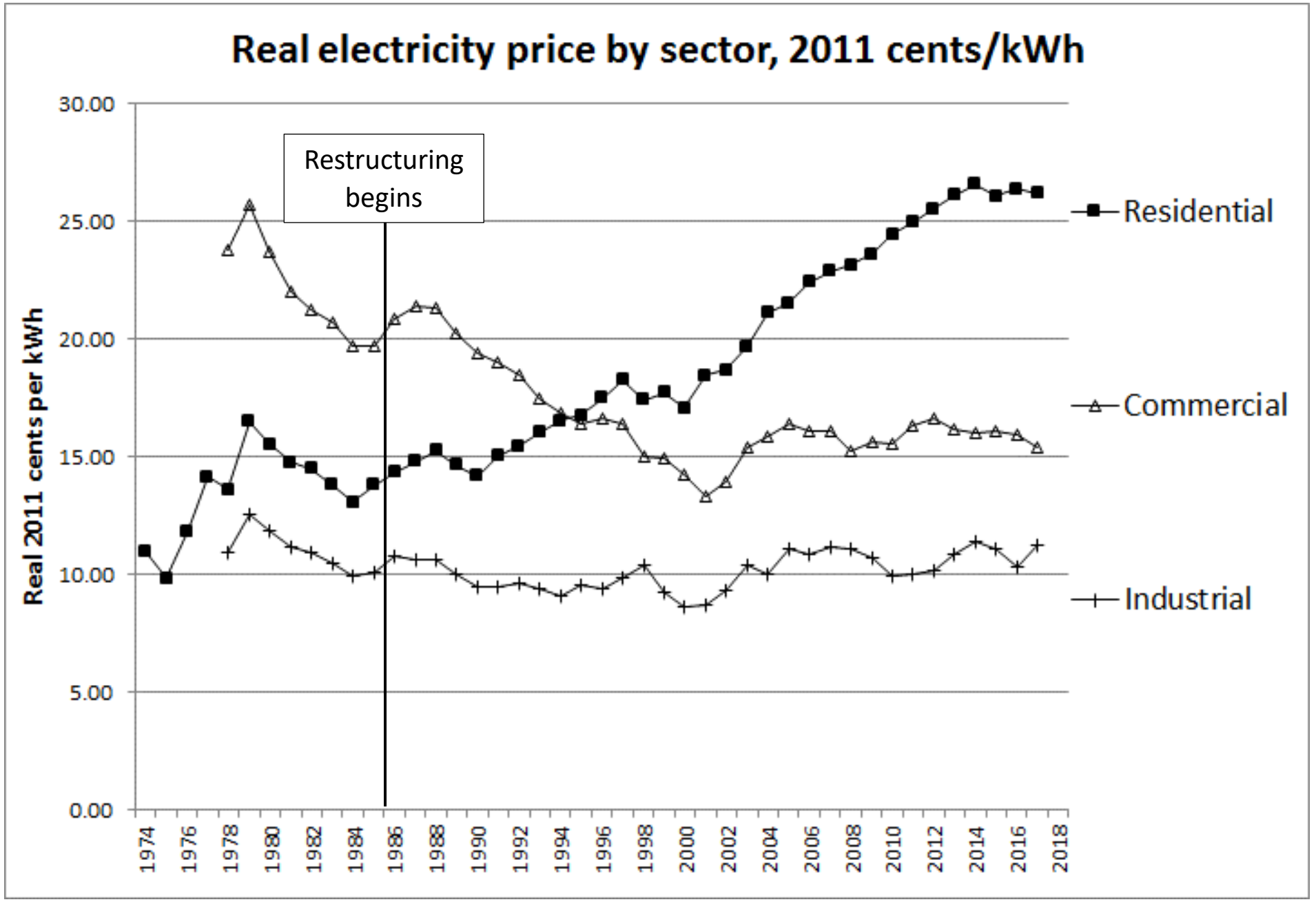
2008 Commerce Commission begins “regulating” lines companies

2013-14 Part-privatisation of the SOE gentailers

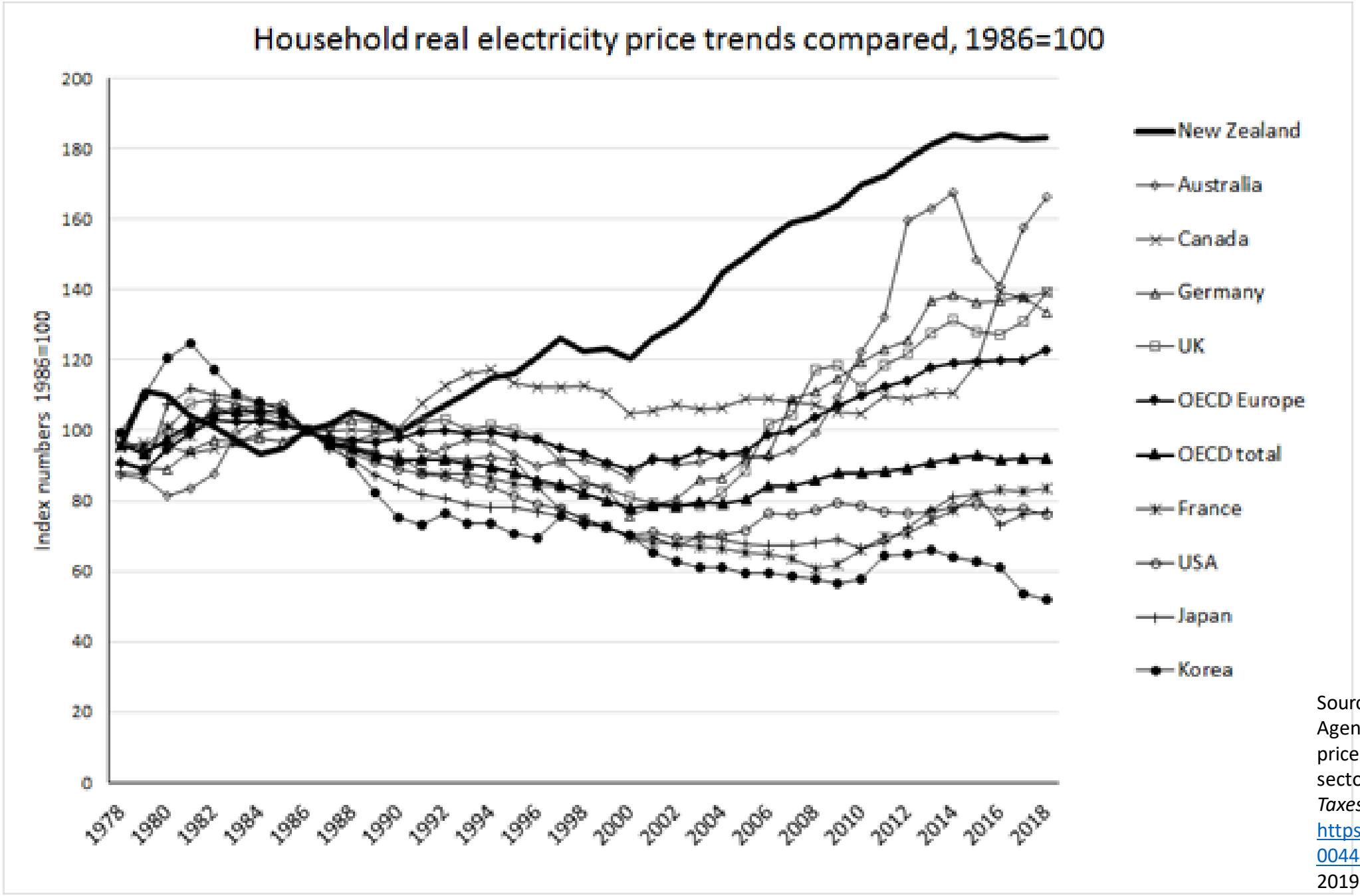
Central claim of reformers: a more-market set-up would raise productivity and bring prices down

So how did the great experiment work out?

First, prices…….



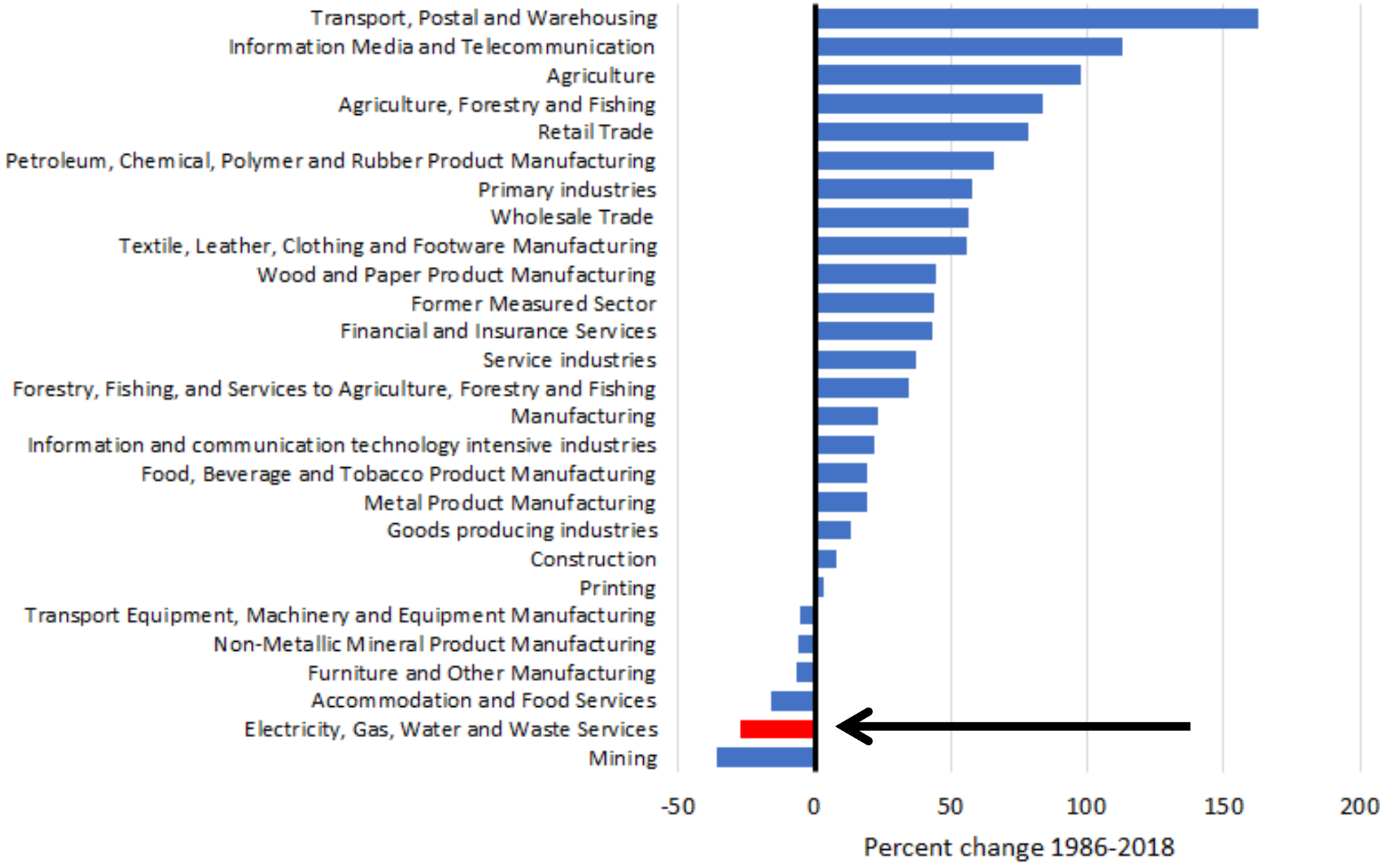
Source: MBIE data from https://www.mbie.govt.nz/assets/Data-Files/Energy/energy-quarterly-statistics/a0285022ed/prices-statistics.xlsx downloaded 20 May 2019, deflated to 2011 values using CPI for residential and PPI Inputs for commercial and industrial.



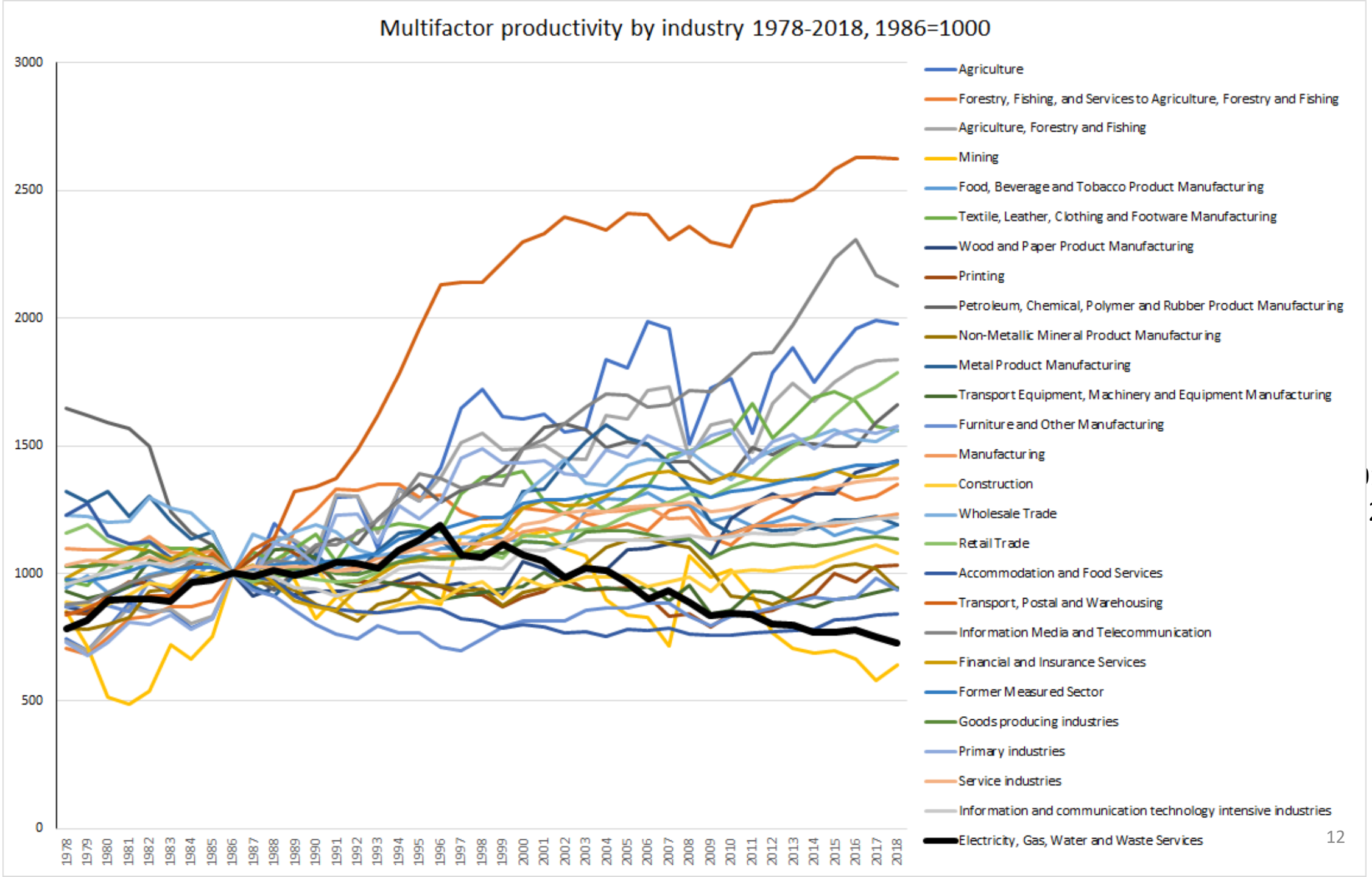
Source: International Energy Agency (2019), "End-use prices: Indices of energy prices by sector", *IEA Energy Prices and Taxes Statistics* (database), https://doi.org/10.1787/data-00444-en (accessed on 20 May 2019). Series rebased by author to 1986=100.

Productivity?

Percent change in multifactor productivity 1986-2018



Source: Statistics New Zealand
Infoshare table PRD014AA
updated February 2019


Multifactor productivity by industry 1978-2018, 1986=1000
3000
2500
2000
1500
1000
500
0
1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018
Agriculture
Forestry, Fishing, and Services to Agriculture, Forestry and Fishing
Agriculture, Forestry and Fishing
Mining
Food, Beverage and Tobacco Product Manufacturing
Textile, Leather, Clothing and Footware Manufacturing
Wood and Paper Product Manufacturing
Printing
Petroleum, Chemical, Polymer and Rubber Product Manufacturing
Non-Metallic Mineral Product Manufacturing
Metal Product Manufacturing
Transport Equipment, Machinery and Equipment Manufacturing
Furniture and Other Manufacturing
Manufacturing
Construction
Wholesale Trade
Retail Trade
Accommodation and Food Services
Transport, Postal and Warehousing
Information Media and Telecommunication
Financial and Insurance Services
Former Measured Sector
Goods producing industries
Primary industries
Service industries
Information and communication technology intensive industries
Electricity, Gas, Water and Waste Services

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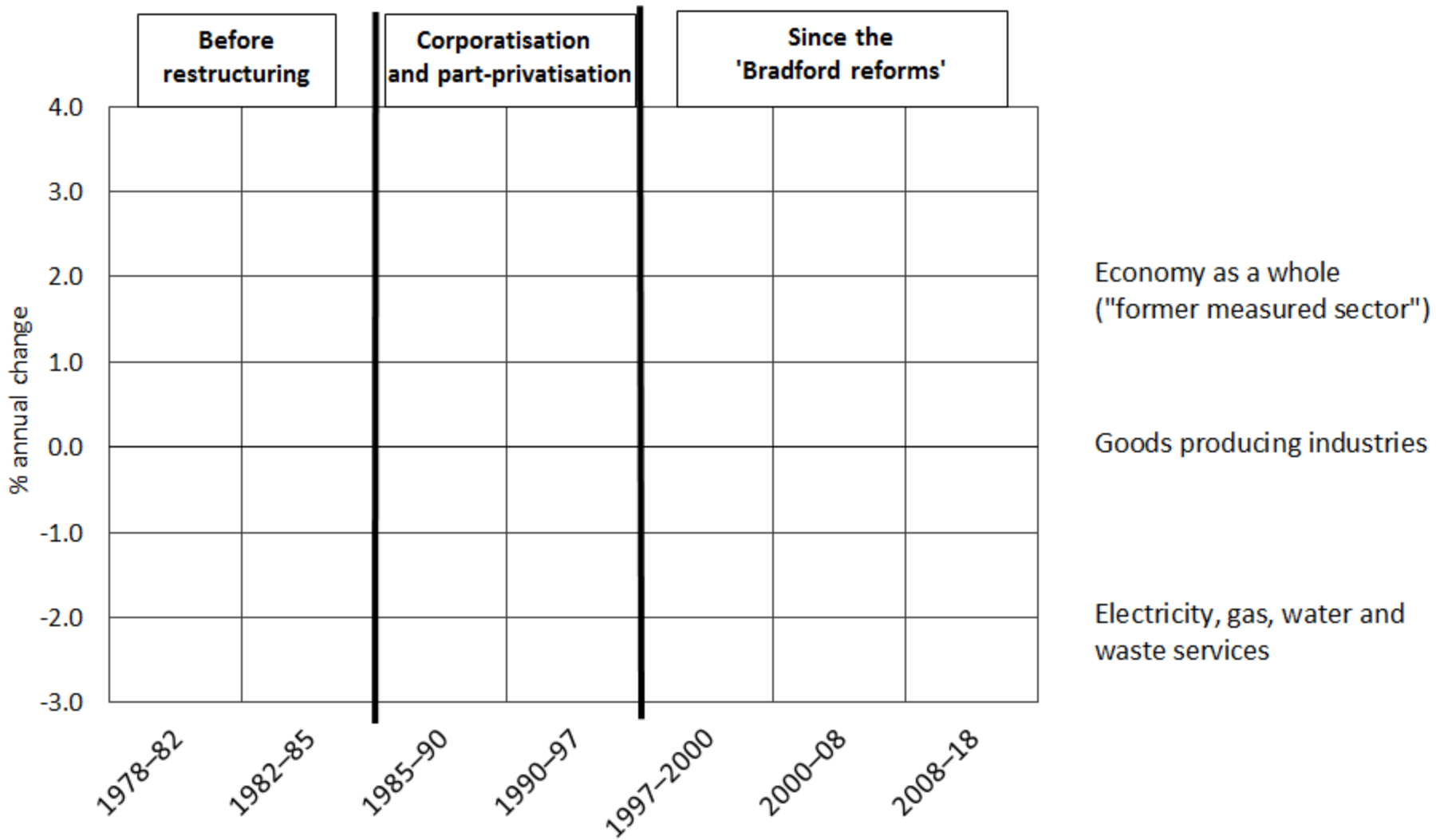
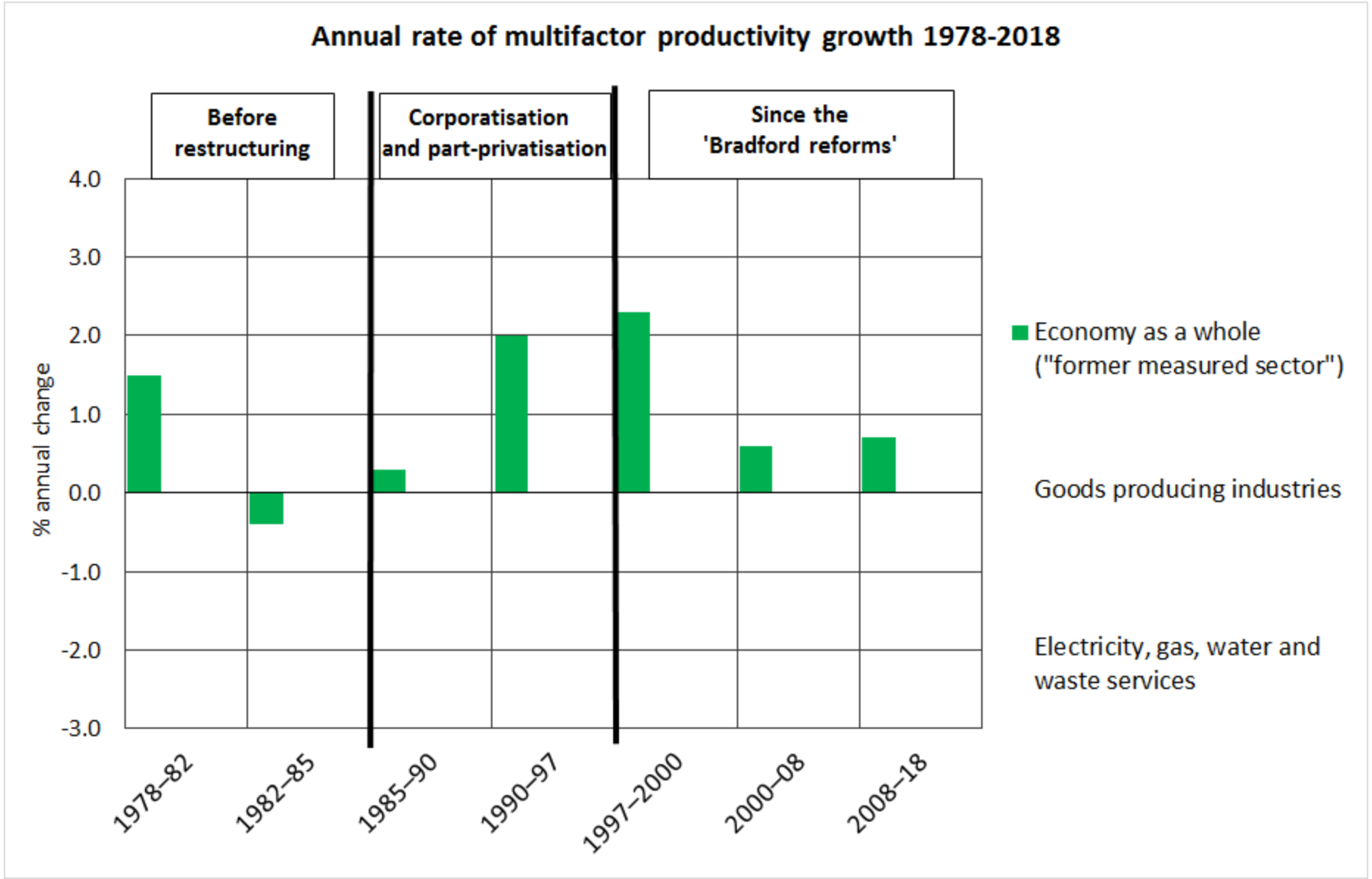
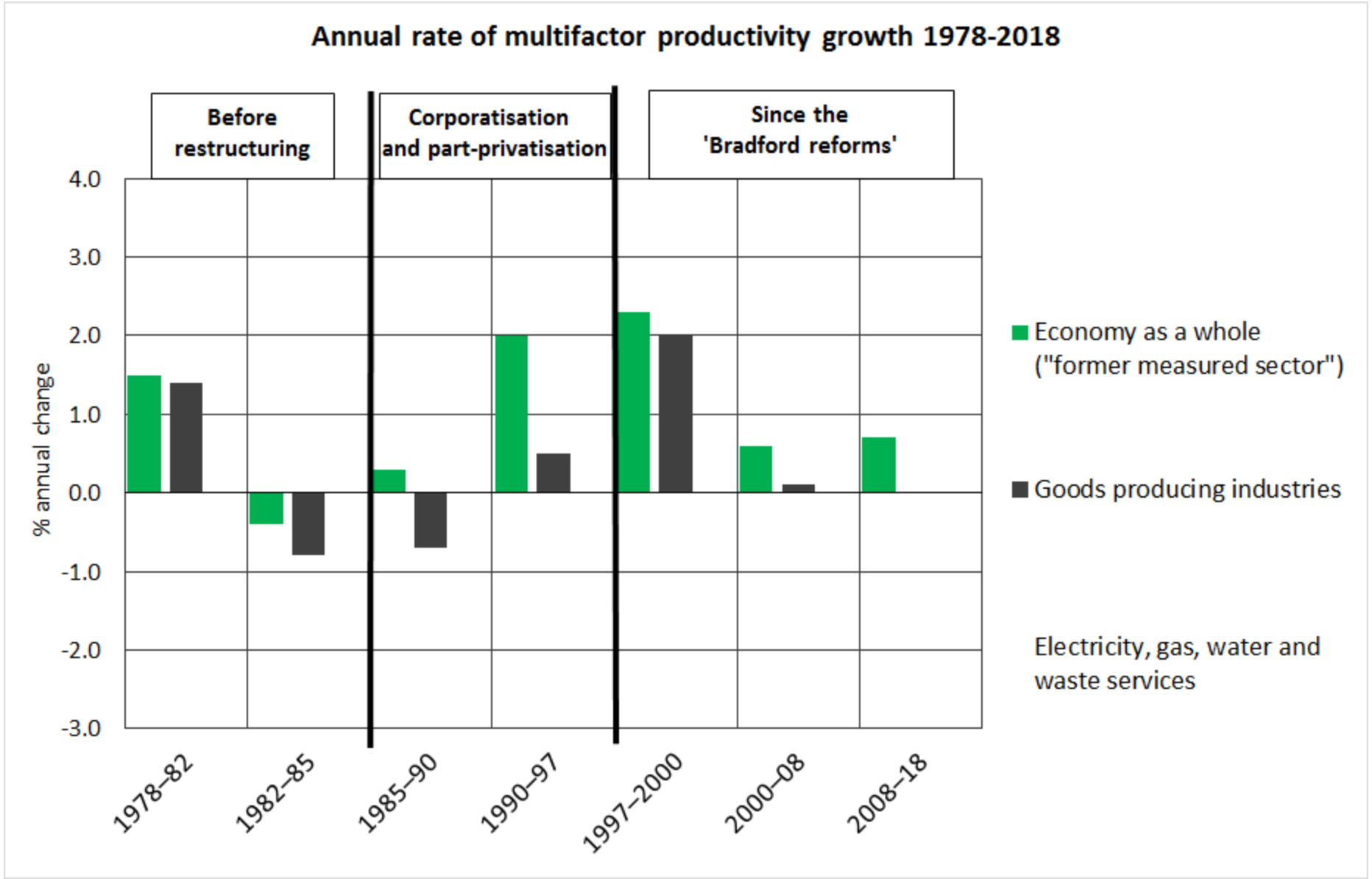
2019

Annual rate of multifactor productivity growth 1978-2018




Annual rate of multifactor productivity growth 1978-2018
Before restructuring
Corporatisation and part-privatisation
Since the 'Bradford reforms'
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
% annual change
1978–82
1982–85
1985–90
1990–97
1997–2000
2000–08
2008–18
Economy as a whole ("former measured sector")
Goods producing industries
Electricity, gas, water and waste services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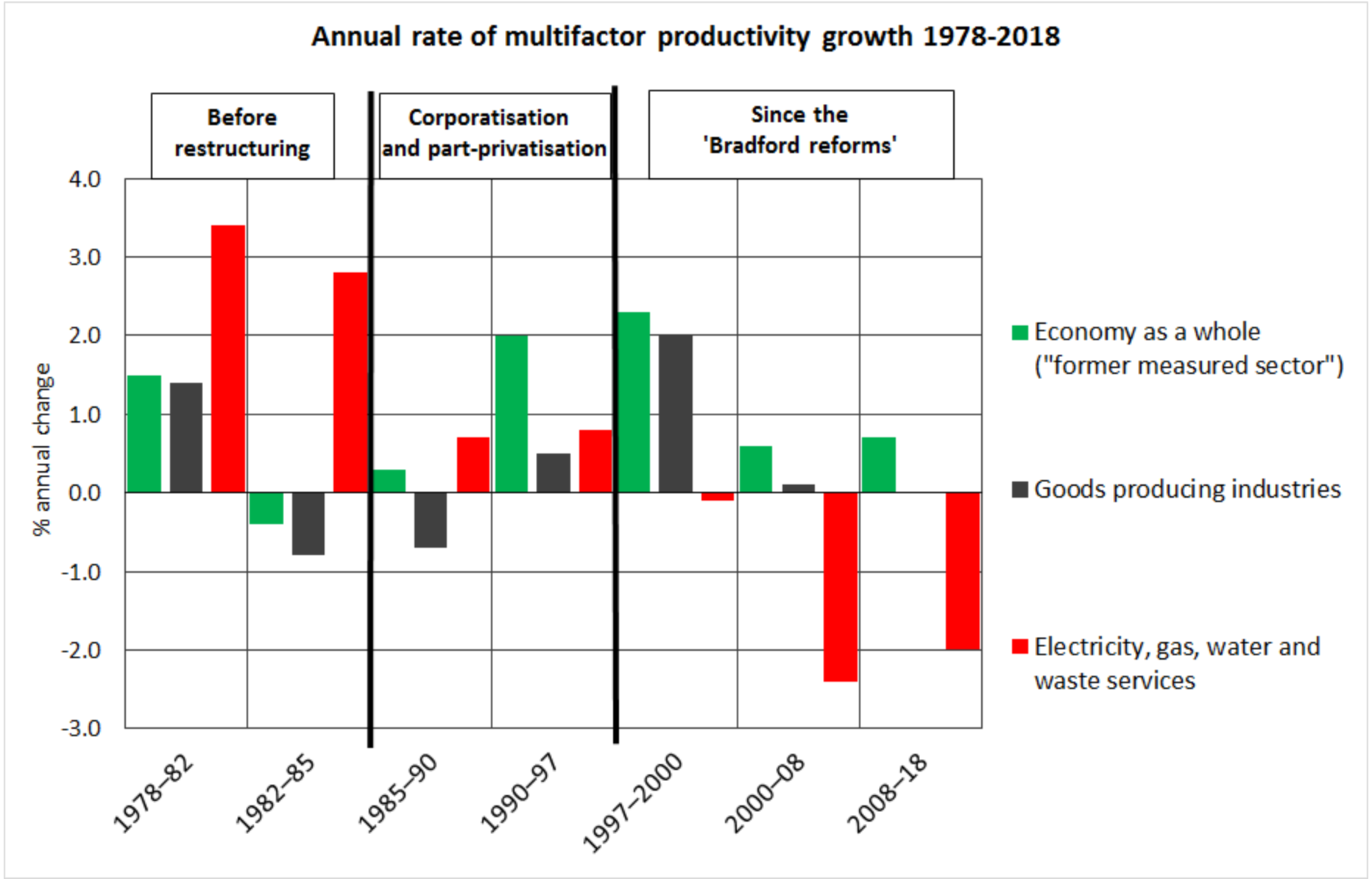
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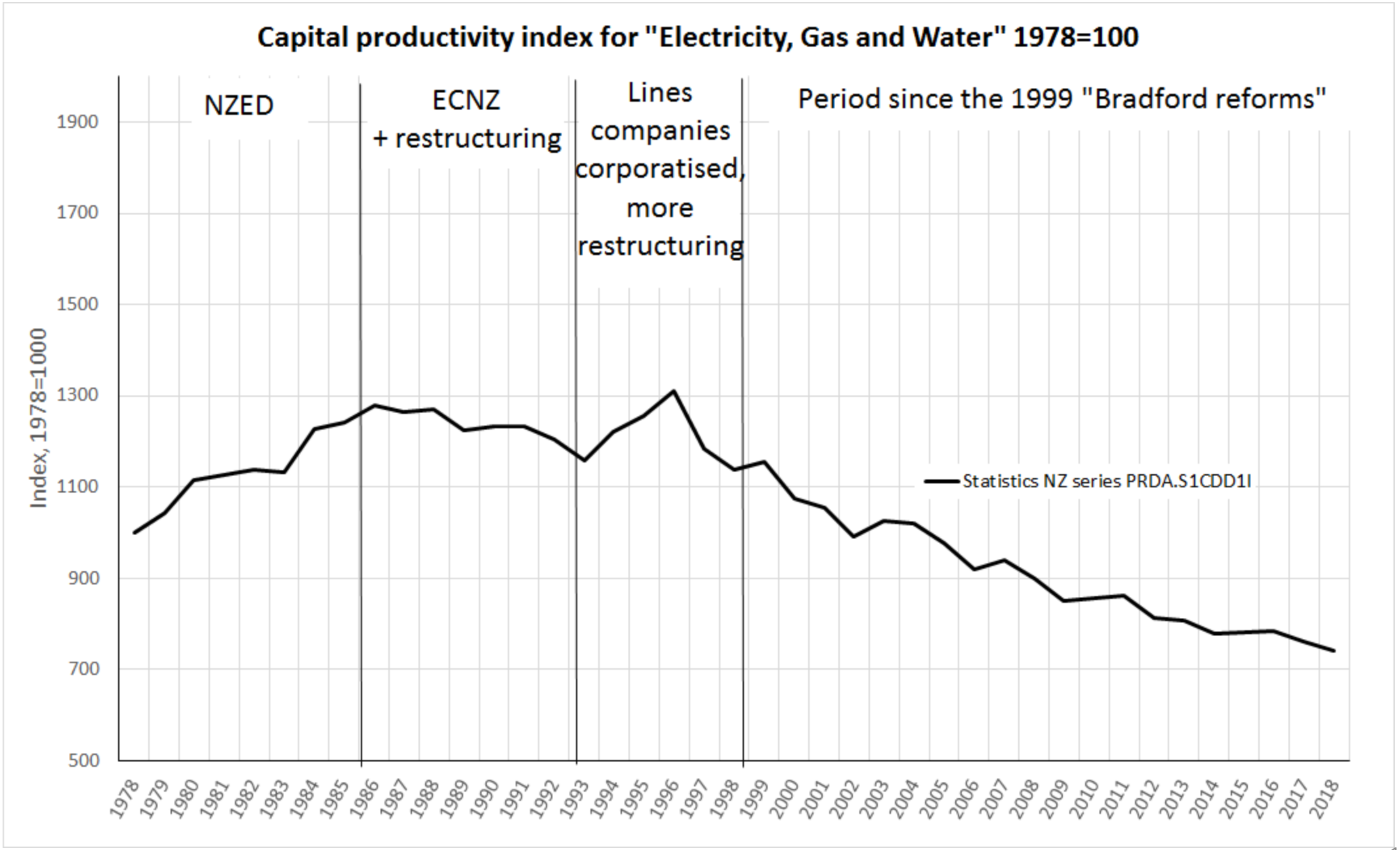
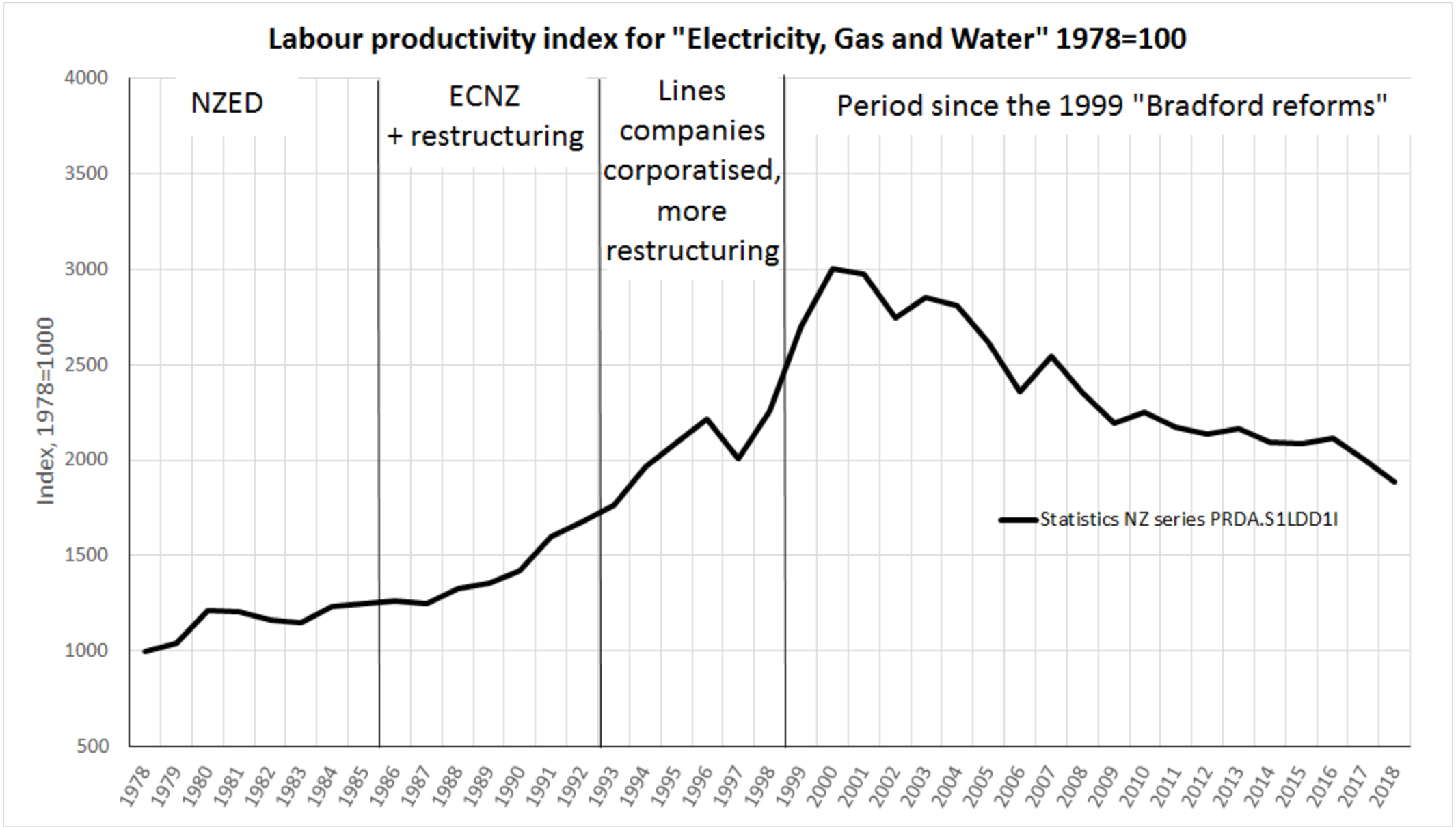
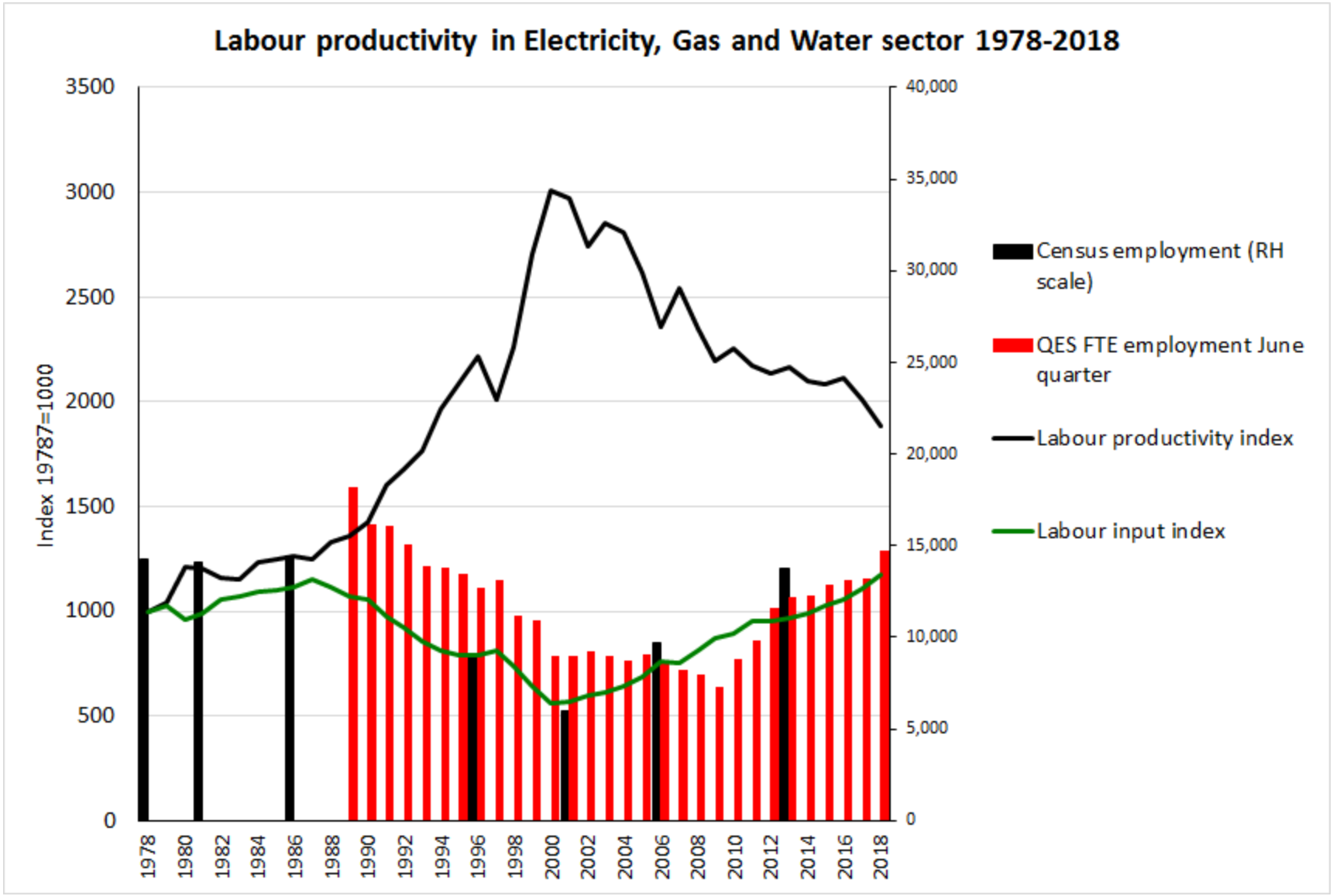

Capital productivity index for "Electricity, Gas and Water" 1978=100
NZED
ECNZ
+ restructuring
Lines companies corporatised, more restructuring
Period since the 1999 "Bradford reforms"
Index, 1978=1000
1900
1700
1500
1300
1100
900
700
500
Statistics NZ series PRDA.S1CDD1I
1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018


Labour productivity index for "Electricity, Gas and Water" 1978=100
NZED
ECNZ
+ restructuring
Lines companies corporatised, more restructuring
Period since the 1999 "Bradford reforms"
Index, 1978=1000
4000
3500
3000
2500
2000
1500
1000
500
Statistics NZ series PRDA.S1LDD1I
1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018



Sources: Quarterly Employment Survey data from Statistics New Zealand Infoshare table QEX019AA. Census data 1996 on from http://nzdotstat.stats.govt.nz/WBOS/Index.aspx?DataSetCode=TABLECODE8212 downloaded 15 May 2019. Earlier census data from published volumes.

Bottom line here: Over the past two decades this sector has been loaded up with labour and capital engaged in unproductive activities

- Pursuit of profit combined with complicated “competition” games and financial engineering has meant that increasing amounts of labour and capital have been allocated to high-paid sales, marketing, financial management and administrative work that adds nothing to the volume or quality of the electricity reaching consumers

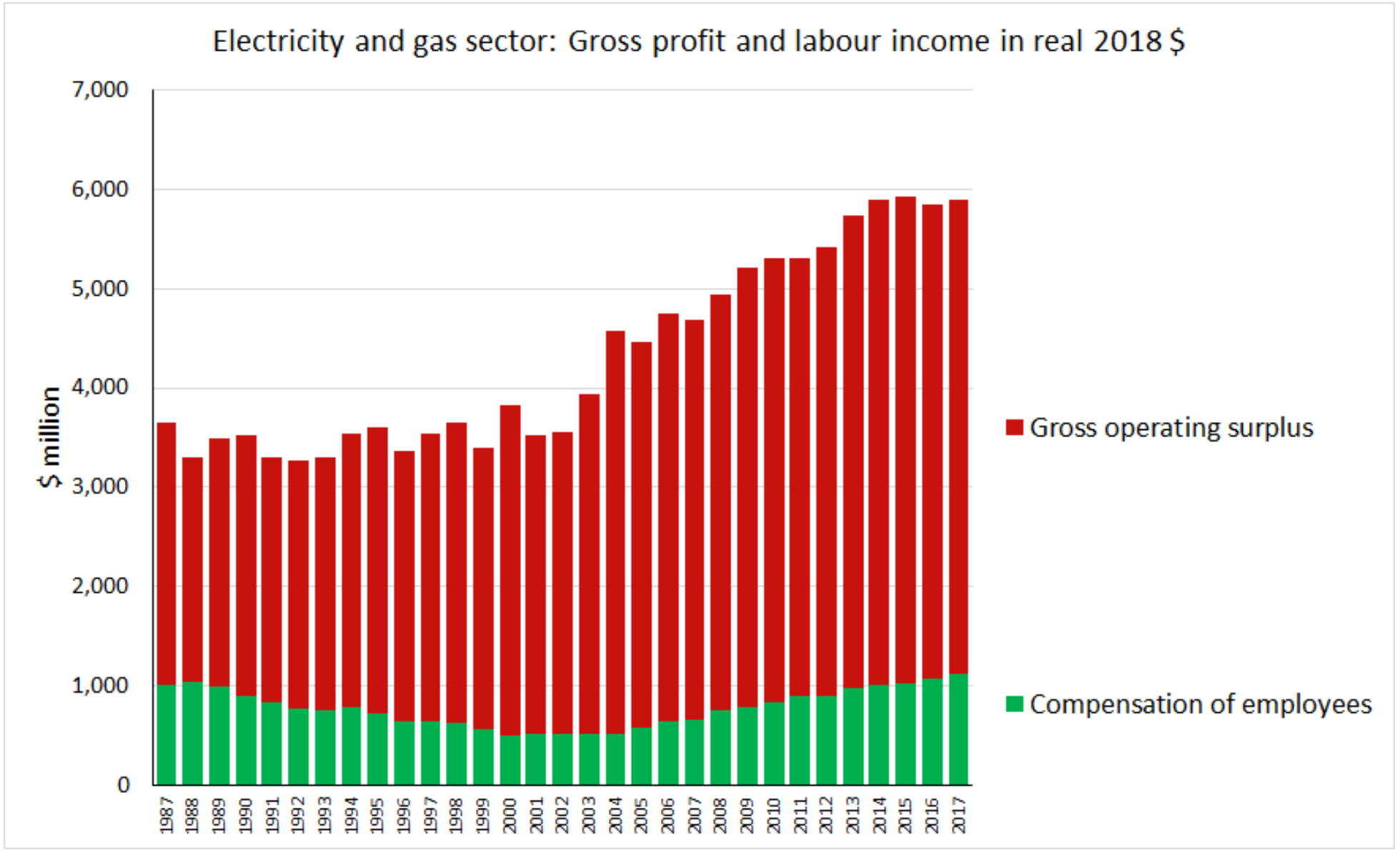
- Corporatisation and privatisation seem to have been a gigantic exercise in waste generated by rent-seeking

We were not alone…

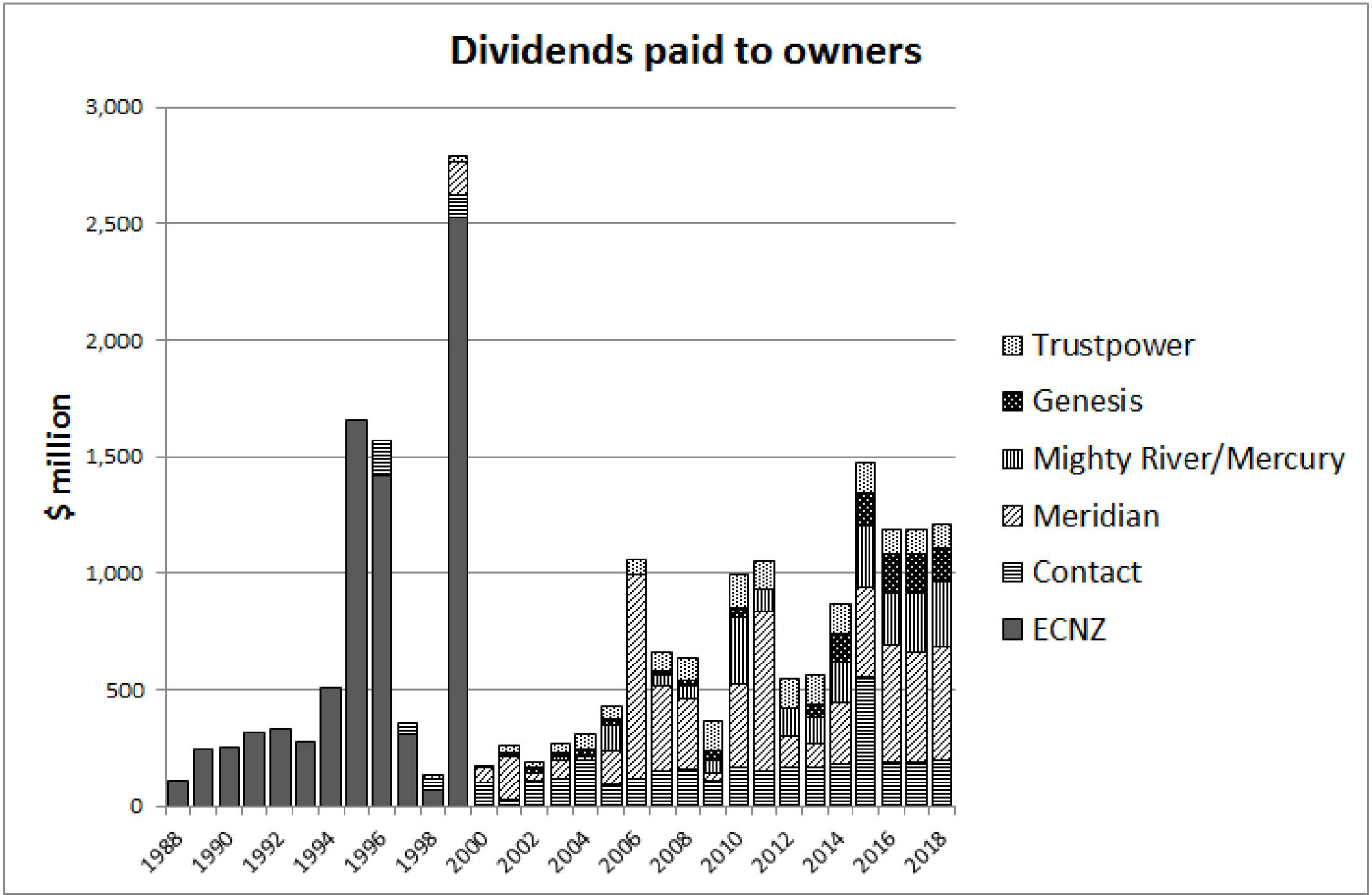
> "For the past generation, the electricity industry has been a key testing ground for neoliberal economic philosophy: namely, the idea that industries function most efficiently, and can best meet the needs of consumers, when the role of government is minimised, and key decisions regarding investment, technology, and pricing are left up to private, for-profit companies. Given the radical extent of the market-driven policy experiments … one would think the sector would today be a paragon of efficiency, stability and consumer well-being. But in fact, the reverse has been true. Prices for electricity have soared faster than almost any other major consumer item. The core economic efficiency of electricity production and distribution has performed worse than any other industry since these market experiments began. … In short, the electricity industry seems to provide a textbook study in how not to manage the economy.
>
> …
>
> This grand experiment in privatisation, competition and marketization, inspired by faith in the supposedly all-knowing efficiency of market forces, has in fact created an industrial structure marked by fragmentation, duplication, and waste."

David Richardson, *The Costs of Market Experiments: electricity consumers pay the price for competition, privatisation, corporatisation and marketization*, Canberra: The Australia Institute, January 2019, http://www.tai.org.au/sites/default/files/P470%20Electricty%20Consumers%20Pay%20the%20Price%20%5BWEB%5D.pdf , pp.2-3.

But profits have been healthy!

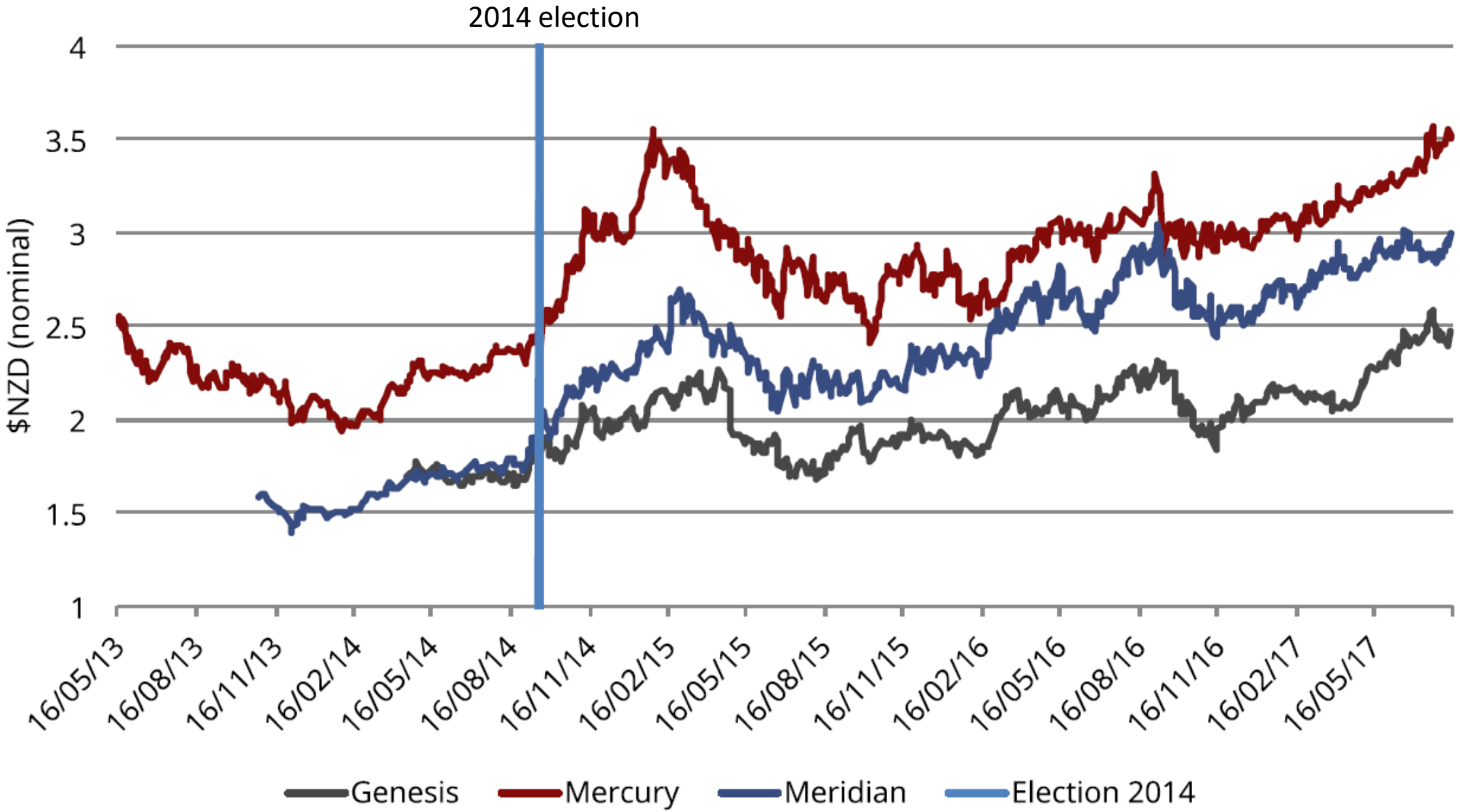


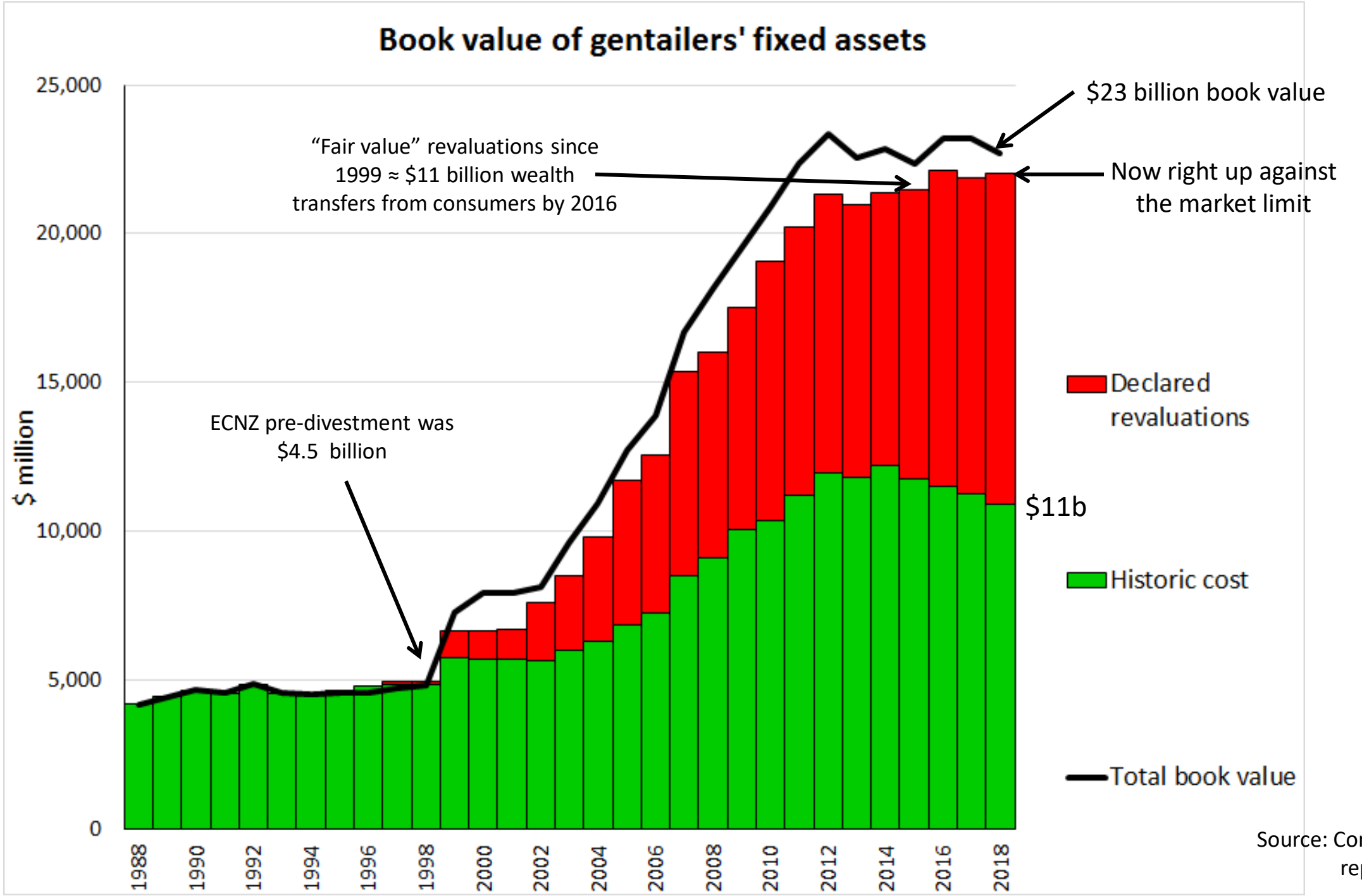
Source: Statistics NZ https://www.stats.govt.nz/assets/Uploads/National-accounts-industry-production-and-investment/National-accounts-industry-production-and-investment-Year-ended-March-2017/Download-data/national-accounts-industry-production-investment-year-ended-march-2017.xlsx downloaded 20 May 2019.



Source: company annual reports

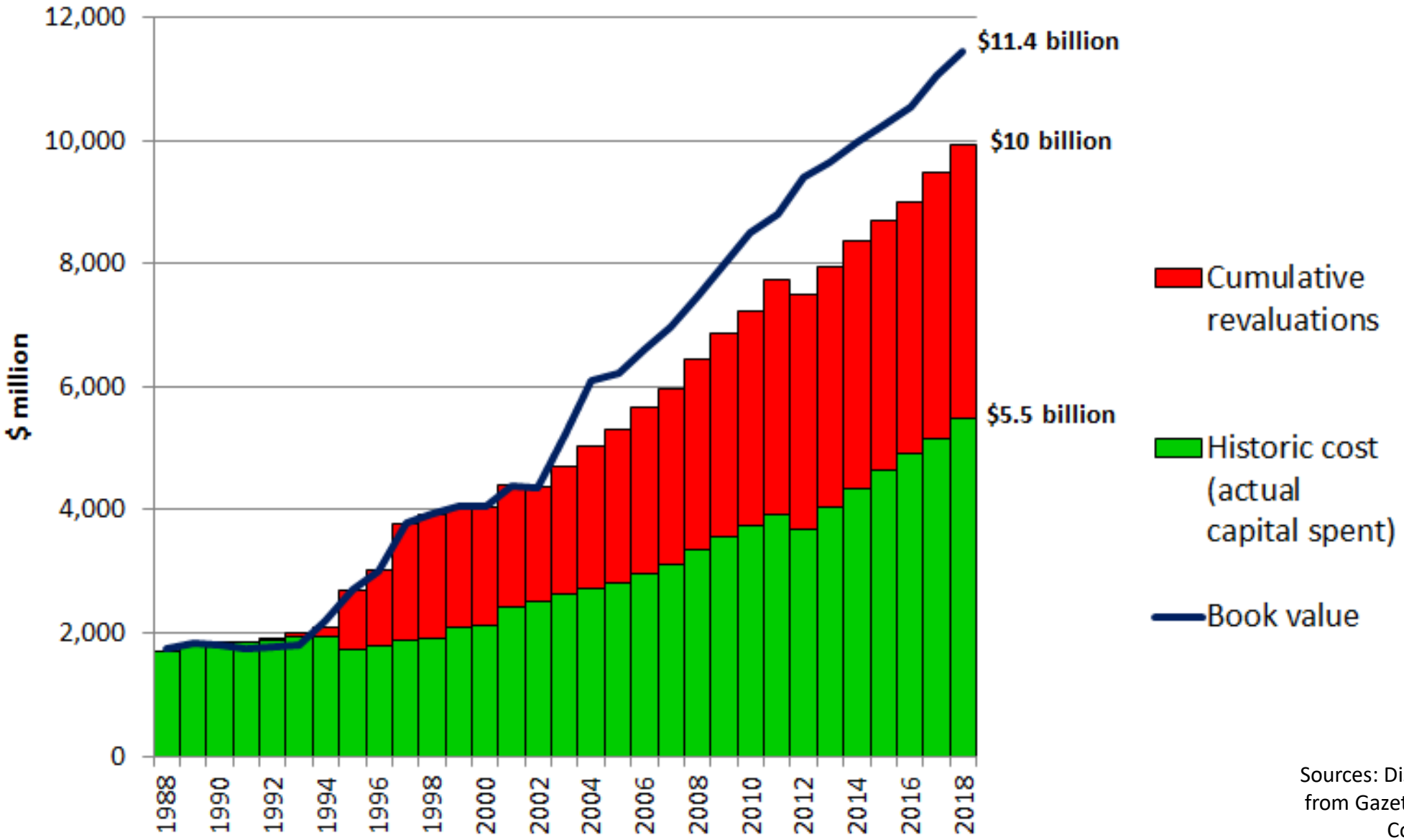
Figure 2: Share price - Mercury, Meridian, Genesis





Source: Company annual reports

Supply authorities/lines companies fixed assets book value

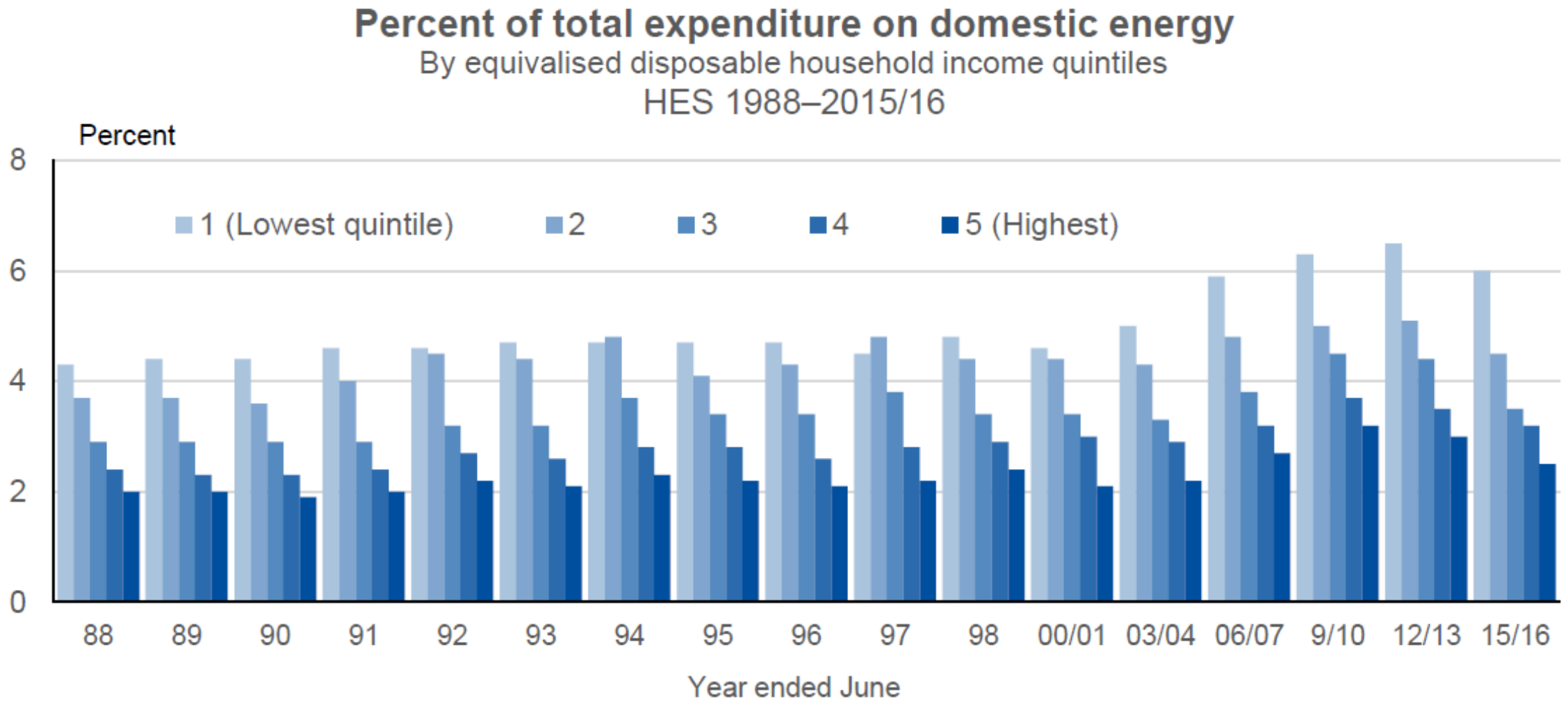


Sources: Disclosed information from Gazettes and Commerce Commission

In summary

- Productivity has gone down 42% since 1986
- Residential prices have gone up 90% since 1986 (while industrial prices hardly changed, and commercial prices fell 25%)
- Gross profit has gone up 81% since 1986 (compared with a 12% real increase in labour income)
- That is the clear footprint of market power being exercised at residential consumers' expense – and one of the key sources of rising inequality and growing poverty (both child poverty and energy poverty in general)

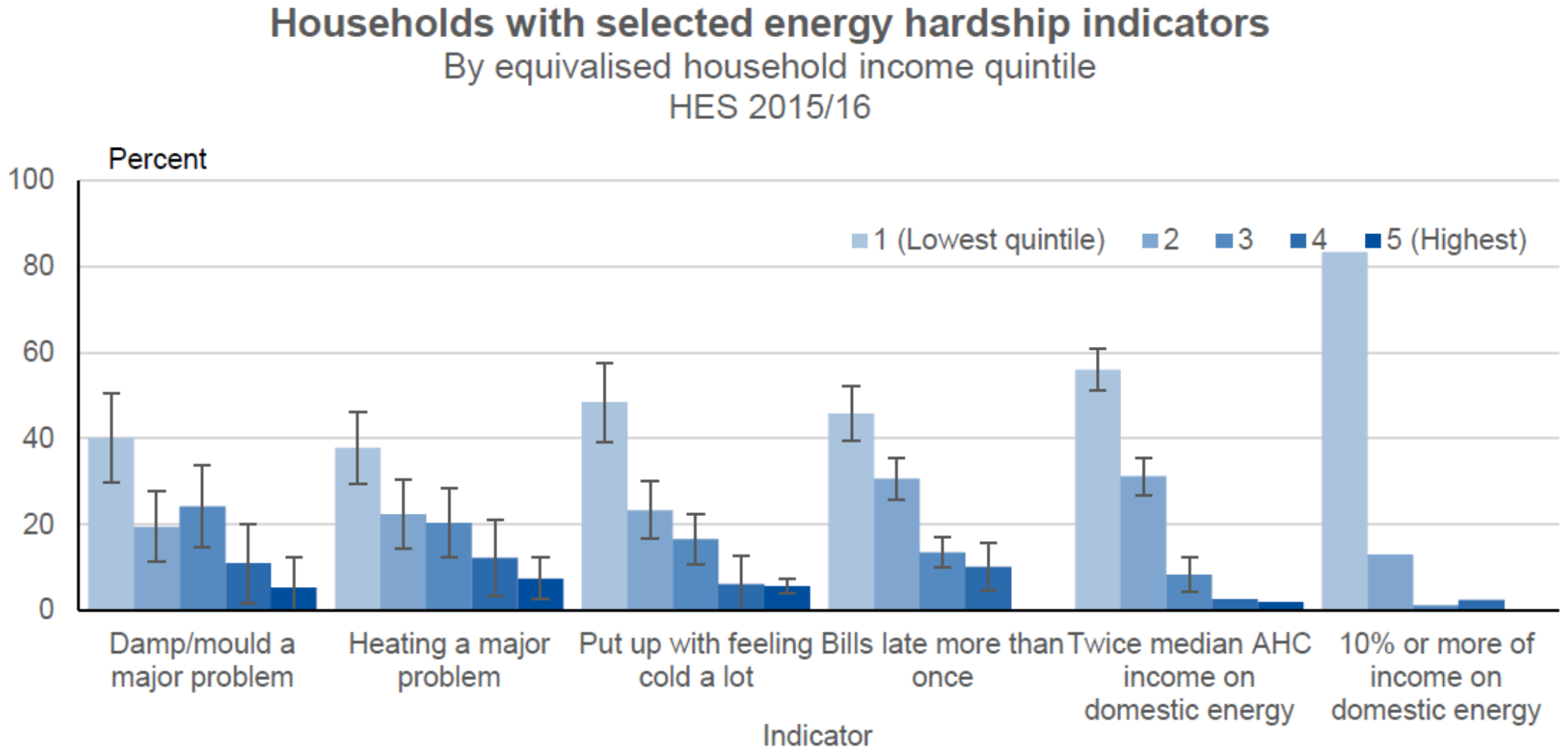
Figure 4



Note: Until 1998, HES collected information on energy costs annually. After 1998, it was collected every three years as part of the full expenditure survey.
Source: Stats NZ

Source: Statistics New Zealand *Investigating different measures of energy hardship in New Zealand* September 2017 http://archive.stats.govt.nz/~/media/Statistics/browse-categories/people-and-communities/households/energy-hardship/Investigating-different-measures-of-energy-hardship-in-New-Zealand.pdf, p.17 .

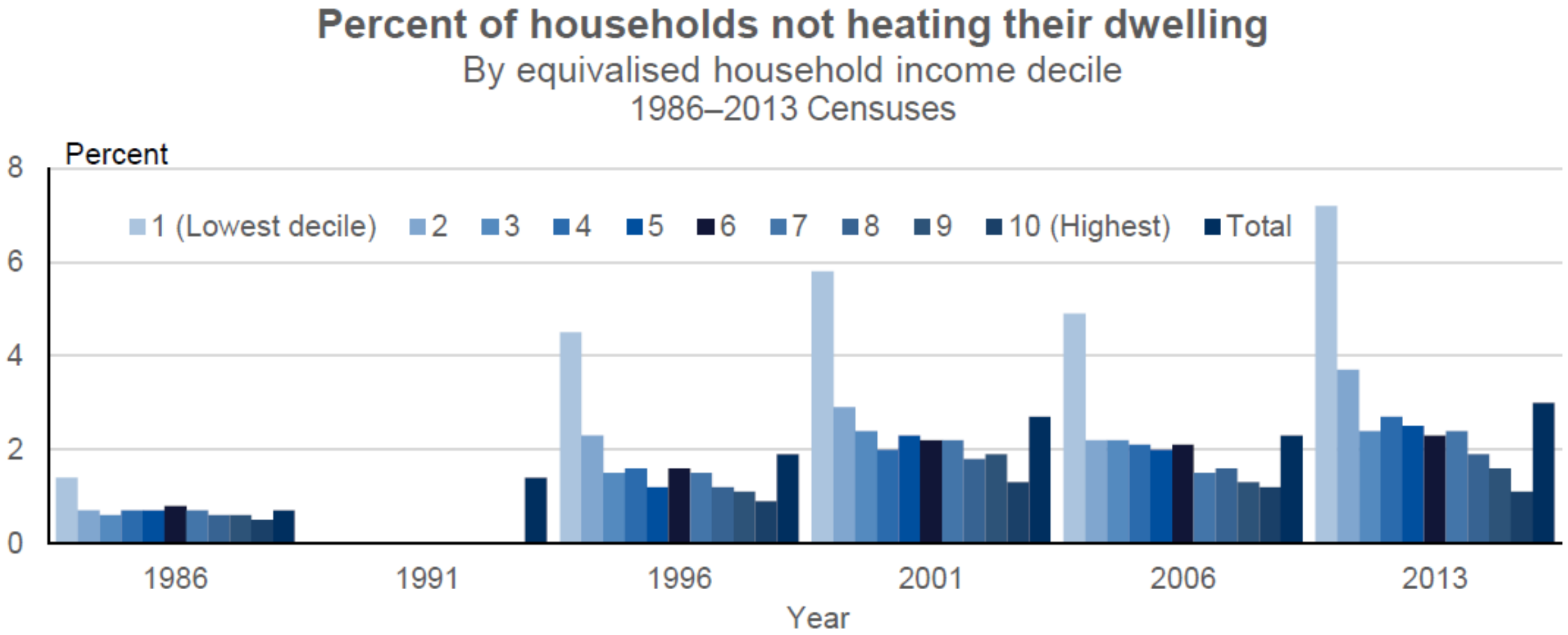
Figure 5



Note: AHC refers to income after housing costs. Error bars show the 95% confidence interval of the estimate.
Source: Stats NZ

Source: Statistics New Zealand *Investigating different measures of energy hardship in New Zealand* September 2017 http://archive.stats.govt.nz/~/media/Statistics/browse-categories/people-and-communities/households/energy-hardship/Investigating-different-measures-of-energy-hardship-in-New-Zealand.pdf, p.21 .

Figure 12



Note: In 1991, not all data was available.
Source: Stats NZ

Source: Statistics New Zealand *Investigating different measures of energy hardship in New Zealand* September 2017 http://archive.stats.govt.nz/~/media/Statistics/browse-categories/people-and-communities/households/energy-hardship/Investigating-different-measures-of-energy-hardship-in-New-Zealand.pdf, p.38 .

For residential consumers

- From having no choice in a low—priced market to having lots of “choice” in a high-price market
- The idea that “more market”, “more choice” and “sharp-eyed business practices” would bring prices down or hold them down was unfounded from the start
- But ministers clearly had advice from somewhere that consumers would benefit via lower prices: Butcher, Luxton, Kidd, Bradford and Hodgson
- Electricity Authority remains focused on “competition for the long-term benefit of consumers”

Quick diagnosis of 7 problems (not an exhaustive list!)

- Breaking up an integrated tightly-planned system loses synergies (there is an efficient minimum size for a "firm" – Coase) => separating "lines" from "energy" killed off both local-level integrated supply and national-level planned operation
- Gentailer "competition" is not what the economics textbooks mean by competition, and vertical integration of generation and retailing has foreclosed competitive entry to retail
- Financial engineering took out cash up front leaving high ongoing "finance costs"
- If you price wholesale electricity (generation) in an increasing-cost industry at marginal cost (what Treasury calls "true cost") in place of average cost, price must rise
- Allowing natural monopoly lines networks to price up to the limit of "contestability", and to value their assets accordingly, incentivises price-gouging and asset write-ups the story of the 1990s
- Applying "building-block" regulation in 2008 after monopolists' asset values had been driven up meant putting a floor, not a cap, on lines charges ("regulatory capture")
- Regulating lines company revenue but not price leaves allocation across customer classes wide open to exploitation of the most vulnerable captive customers ("Ramsey pricing")

Ronald Coase 1937*:

Outside the firm, price movements direct production, which is co-ordinated through a series of exchange transactions on the market. Within a firm, these market transactions are eliminated and in place of the complicated market structure with exchange transactions is substituted the entrepreneur-co-ordinator, who directs production.[2] It is clear that these are alternative methods of co-ordinating production.

- Within the firm scarce resources are allocated by planning (that's what "management" means)
- Outside the firm, in the market economy, resources are allocated by the price mechanism
- Each mechanism has its appropriate sphere: a firm should expand to the point where it is cheaper to buy its inputs from outside than to make them itself
- So NZED and ECNZ had higher productivity than their replacements

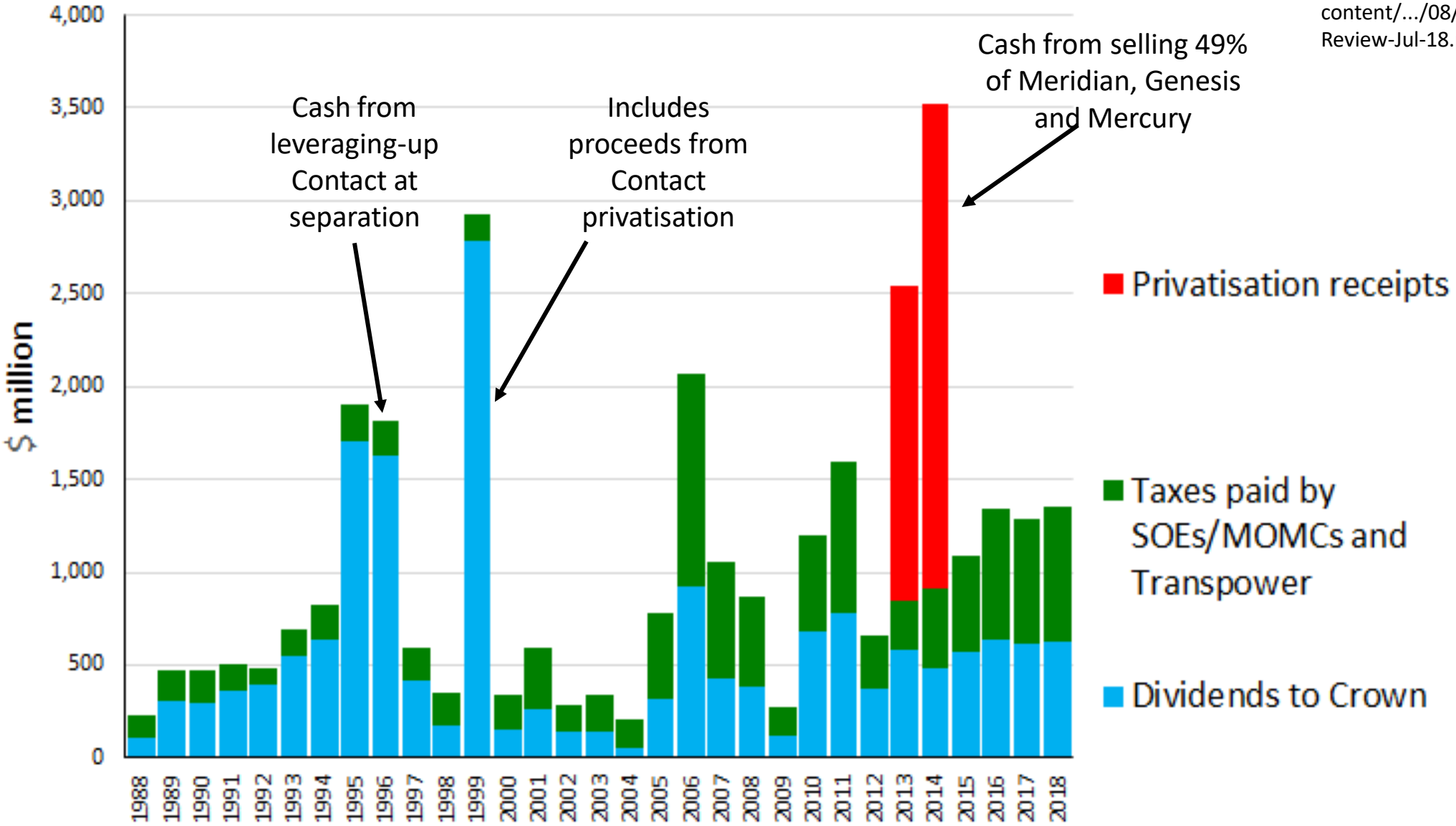
* R.H. Coase "The nature of the firm" *Economica*, New Series, Vol. 4, No. 16 (Nov., 1937), pp. 386-405, at p.388.

But the efficiency benefits of integration do not necessarily translate to lower prices for consumers

- Integration and synergies were a strength of NZED as a not-for-profit, and passed through to customers as low average-cost prices
- But once ECNZ was an SOE with a profit margin, its incentive (and its managers' duty) was to exploit its monopoly position at customers' expense if left free to do so
- So what was a strength under public ownership and zero-profit, public benefit goals, became a problem under public ownership with SOE rules
- This was not privatisation (a change in ownership and control): it was a change in the flavour of control and the purposes for which it was exercised
- From the "welfare state" to the "predator state"?

Financial engineering involves taking over “undervalued” assets, writing them up to ”fair (market) value”, then selling-off the assets or raising loans against the new company value, and walking away with the cash.

Crown income from state-owned electricity operations

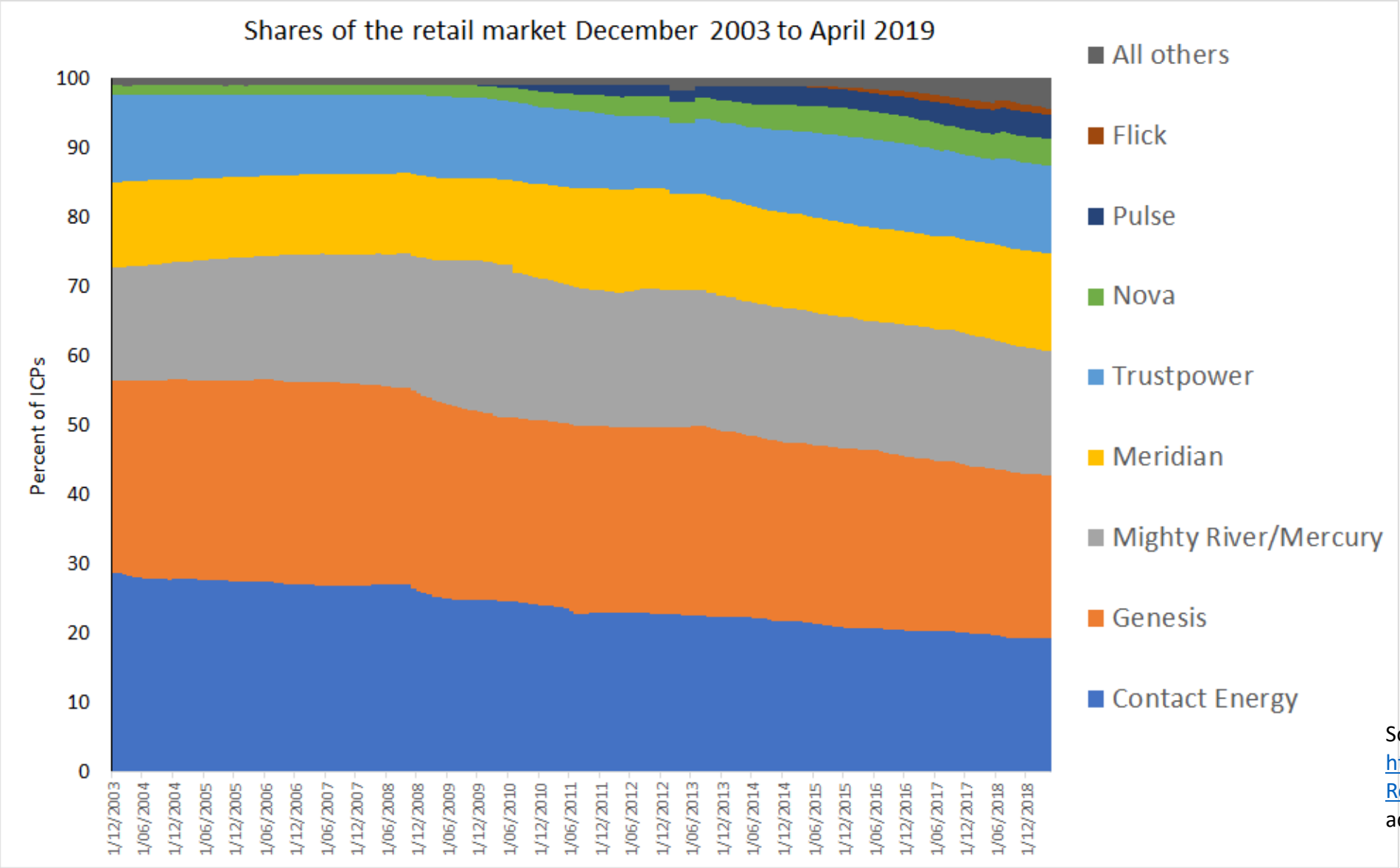


Sources company annual reports, plus TDB Review of Mixed Ownership Model July 2018 https://www.tdb.co.nz/wp-content/.../08/TDB-Mixed-Ownership-Review-Jul-18.pdf

Talking loudly about “competition” does not mean there is real competition

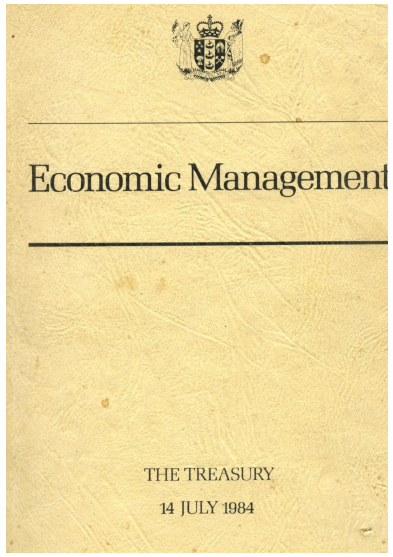
- The market share of each gentailer is tied tightly to the amount of generating capacity it owns, and nobody without generation plant of their own can win much retail market share
- That’s because
  - generation plant is specific to just one use and has no alternative to which it can be bid away; and
  - In a situation of supply insecurity, owning your own generation is far better insurance than relying on a contract with a generator

In 2003 the big five held 97.7% of market connections. In 2019 they hold 87.4%. In volume terms, the big-five share is larger. Transformative that is not.



Source: https://www.emi.ea.govt.nz/Retail/Reports/R_MST_C?_si=v|3#tabs-2 accessed 30 May 2019.

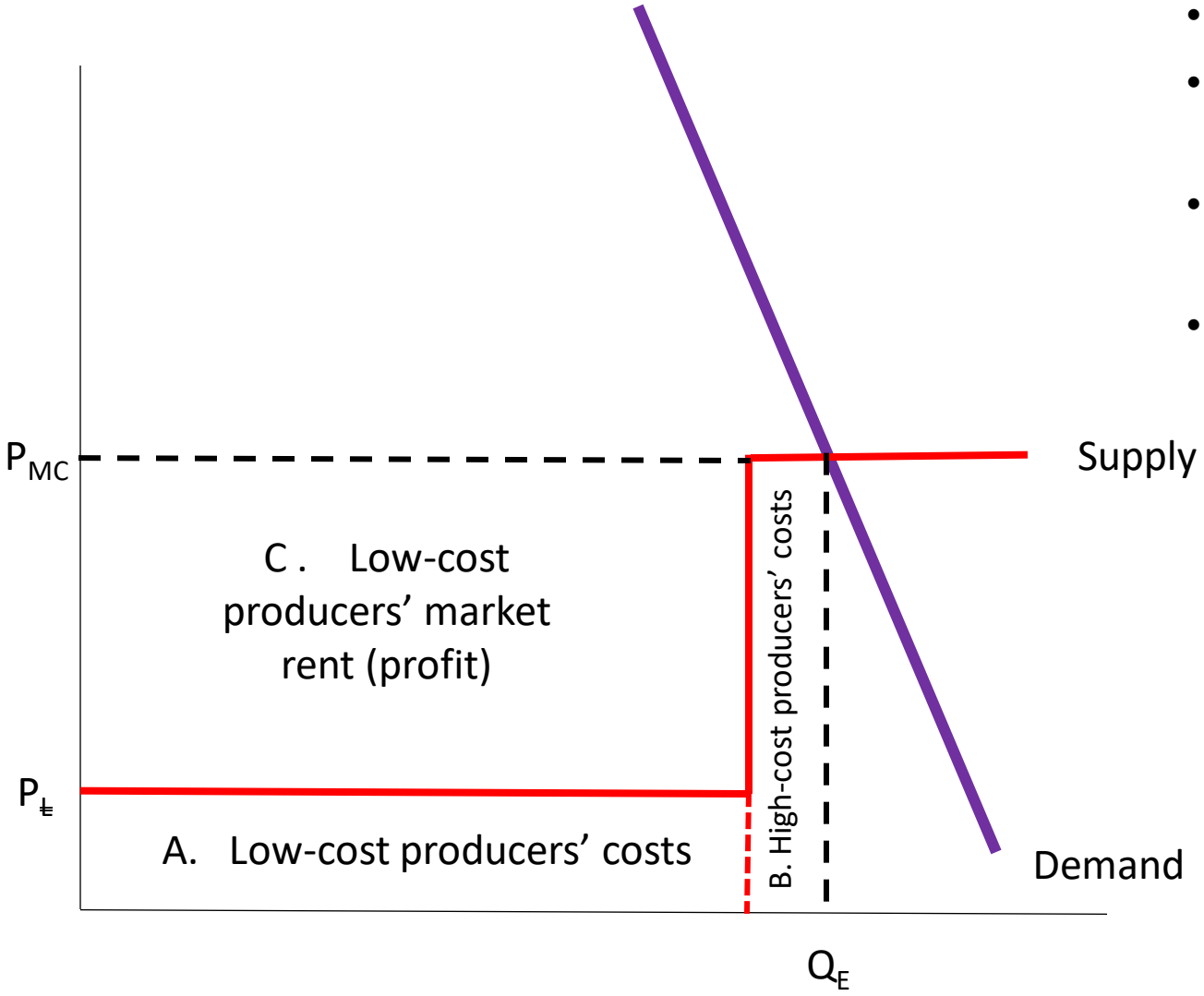
"True cost..."



"The prices of goods and services produced by State owned enterprises (particularly coal and electricity prices) are sometime held below the cost of supply in an attempt to constrain price inflation or to assist users. However, this stimulates the demand for the enterprise's output, squeezes competitors out of the market, and increases the call on government funding as investment increases to meet the stimulated demand…. Holding down individual prices … destroys the important function of prices to convey to users the true cost of supplying goods and services" (p.281).

"Electricity supply faces sharply rising costs for additional supply. This means that marginal costs will greatly exceed average costs, and that marginal cost pricing will yield an excess profit on electricity generation" (Brian Easton and Philip Pryke, "The future pricing of electricity" p.50).

Here's the supply/demand diagram for an increasing-cost industry with low-cost and high-cost producers:

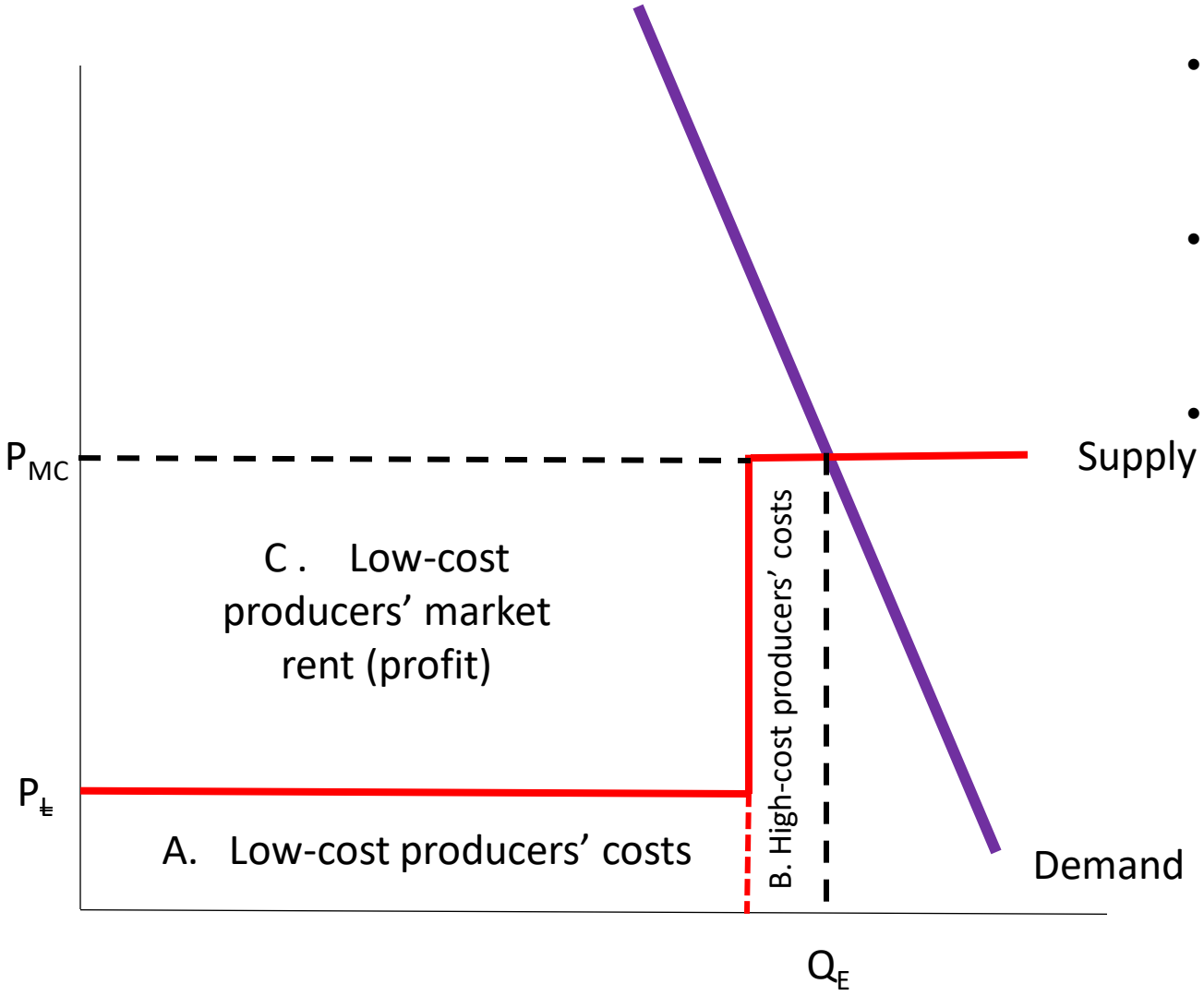


- The total cost of supplying quantity Q_E is (A + B)
- The total revenue from selling this quantity at the marginal-cost price P_{MC} is (A + B + C)
- Area C is pure rent collected by the owners of the low cost plant
- So which is the "true cost" - (A+B) or (A+B+C)?

Average-cost pricing (NZED) → Happier consumers

Marginal-cost pricing (Treasury) → Less happy consumers

Here's the supply/demand diagram for an increasing-cost industry with low-cost and high-cost producers:

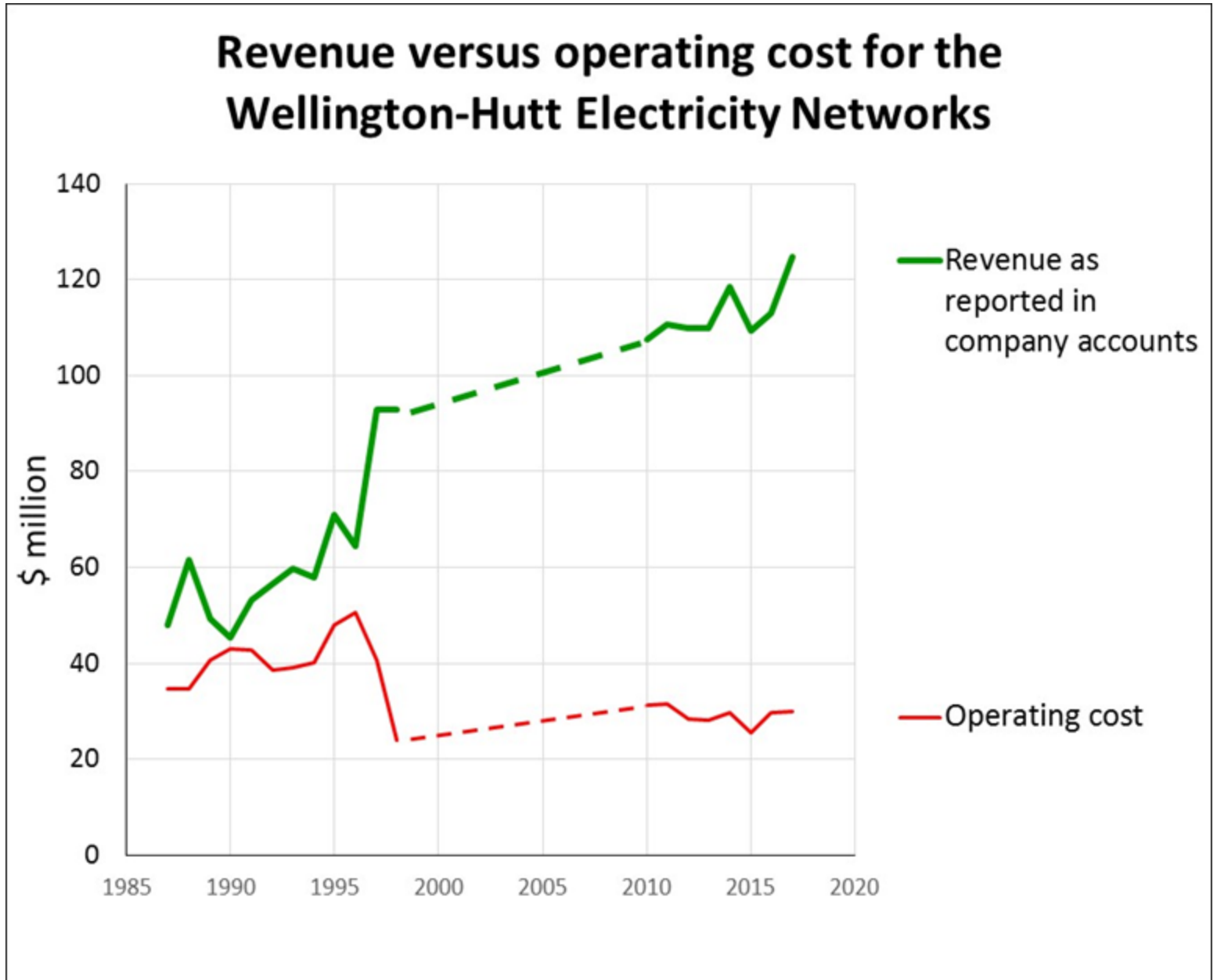


- Those big profits C rely entirely on having high-cost supply at the margin
- Shift the demand curve left (e.g. close the Tiwai Point smelter) and the price drops radically – and so do profits
- Add more low-cost supply and push the high-cost guys out (off the margin) and the price drops radically – and so do profits
- Core strategy for Contact, Meridian, Mercury and Genesis is:

Keep demand up (keep the smelter open!)

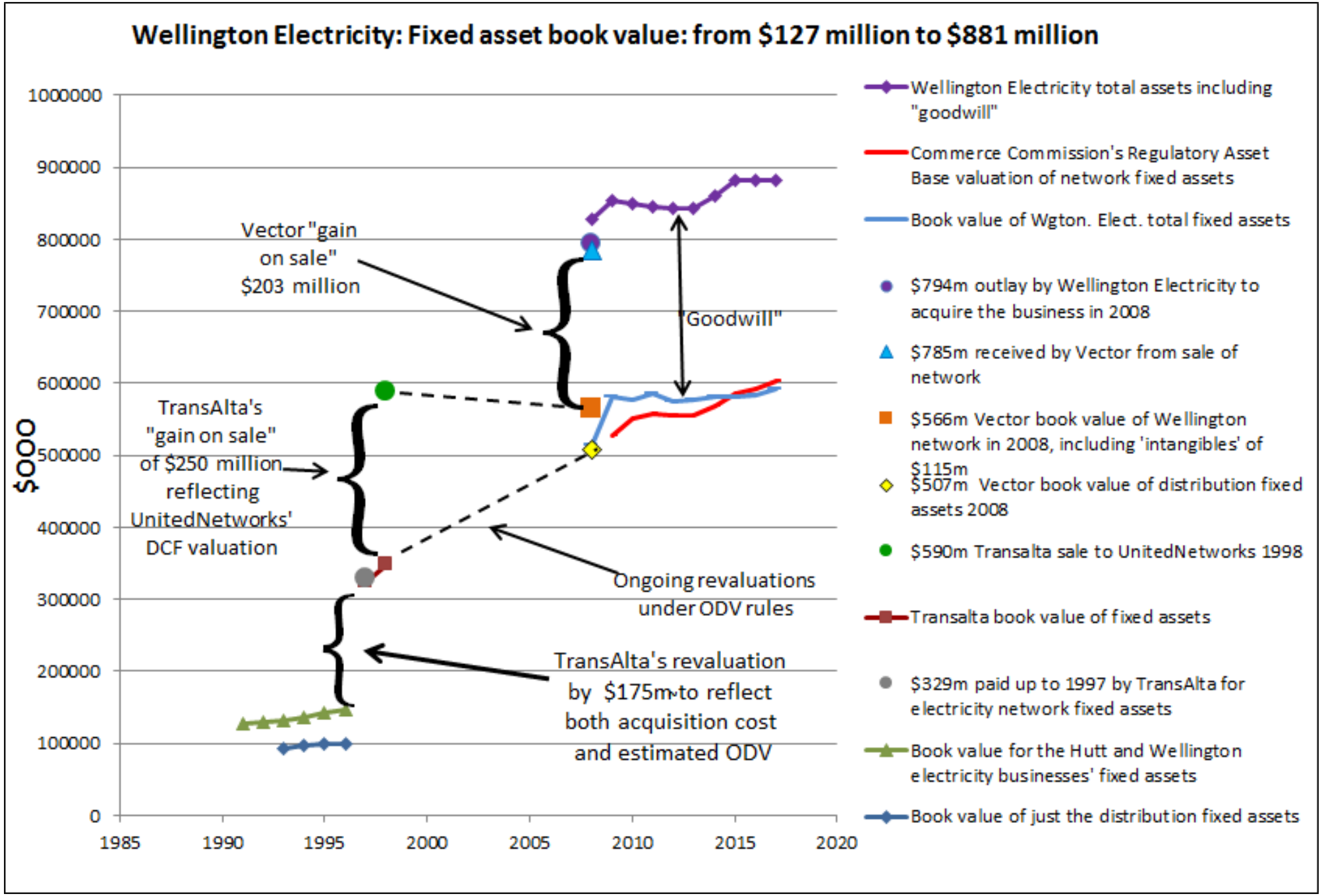
Keep supply constrained (don't build too many windfarms, and block roofstop solar if possible

A typical unregulated lines company story : Wellington Electricity



The big price-gouging, cost-slashing and profit explosion was 1994-1998

Then came the financial engineering….



Sources: Disclosure information from Gazettes and Commerce Commission website; annual reports of Capital Power, Energy Direct, TransAlta, UnitedNetworks, Vector and Wellington Electricity

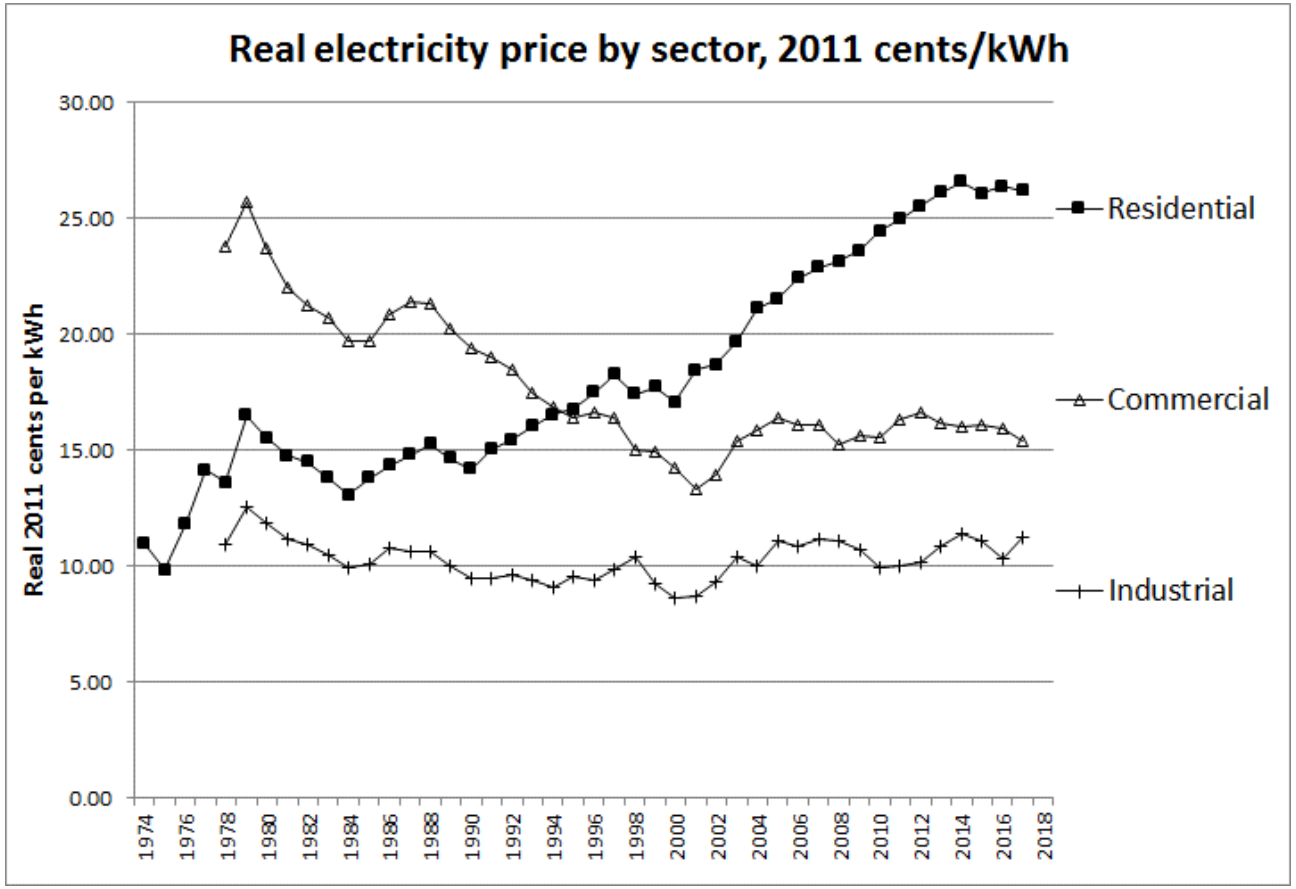
Commerce Commission was finally brought in to “regulate”

- In 2002 it decided to accept, and thereafter protect, protect all the previous decade’s asset revaluations, and the monopoly prices and profits on which they depend
- In 2008 when line company regulation was bring designed, Parliament said the regulated companies should only be “limited in their ability to extract excessive profits”* – not prevented from getting “excessive profits”.
- So the Commission has drawn a “line in the sand” under asset values and regulates lines charges on the basis of “financial capital maintenance” which translates to a floor on lines company total revenue.
- In the economics literature this is often described as “regulatory capture”.

* Commerce Act Amendment 2008 => s.52A of the Commerce Act

Lines companies therefore are guaranteed the right to continue to collect their excess profits on up-valued assets

- But what does this mean for prices? The Commerce Commission leaves the companies free to collect their revenue where they choose.
- Guess who pays the lions' share



So what is to be done?

- Depends on your view of Government
  - Marx: “committee of the bourgeoisie”
  - Buchanan/Friedman/Hayek: predatory, deadweight burden, captured by rent-seekers
  - Social democrats: agent of the people and committed to advancing wellbeing
  - Since 1984 the first two of these have gained a lot of credibility in New Zealand: inequality of income and wealth has been an outcome of deliberate policy passed by Parliament

In an ideal (social-democrat) world

- Reclaim electricity as an essential service and a “commanding height” of the economy, to be controlled by the people for the people
- So scrap the profit-driven market model, re-nationalise the big assets, re-integrate the generation and transmission sectors under efficient planning, return local networks to local control and take the shackles off their ability to build and operate distributed generation, drop the charade of “what’s my number” retail “competition”
- At retail level, ensure that household prices come back down from their current heights, as rents and excess profits are stripped out of the supply chain

  ⇒Either regulate household price, or have a state-owned retailer competing with the other retailers and providing a low-priced option, or go back to community-owned local not-for-profit retailers
- But can you un-scramble an egg?

In the real world as we know it (optimistic)

- Assume some serious willingness to intervene politically [otherwise move to the default below]
- Break up the gentailers by forcing divestment of their retail operations
- Abolish the lines/energy split at distribution level to allow local community-focused energy operations to emerge with secure access to distribution networks and retail customers
- Massively overhaul the Commerce Commission's approach to lines company regulation by switching it from a flor price to a ceiling price, and with a ruthlessly sinking ceiling
- Amend the Commerce Act to prescribe elimination, not just limitation, of excess profits
- Give the Electricity Authority explicit instructions to genuinely advance the interests of consumers and make sure it gets cracking
- Install a single buyer or similar mechanism in the wholesale market and compel generators to offer arms-length hedge contracts

In the real world as we know it (pessimistic)

- Assume Government stays largely paralysed by the vested interests but might do some small-scale fiddling, e.g.
- Insist on a level playing field for distributed generation (rooftop solar, larger solar arrays, independent wind and micro-hydro, local community pools with battery storage
- Ensure that disclosed information is analysed and prominently displayed along the lines of my earlier slides – bring sunlight to bear on the industry
- Appoint more serious regulatory brains to the Commerce Commission, plus measures to reduce industry capture of the regulators and amendments to put some teeth into the Commerce Act
- Impose water royalties on hydro generators and use the money to deliver free or cheap power to low-income households
- Make sure the Tiwai Point power contracts fall into the hands of the state if and when the smelter shuts down, and use these to supply low income households
- Strengthen the grid to enable Tiwai Point power to be diverted north if and when the smelter closes