Electricity Prices, Profits and Productivity

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The big promise of reform

- Back in the 1980s the proposition was that corporatizing, reorganising, and where possible privatising electricity, would bring gains for consumers because

  - Commercial, profit-driven management would raise efficiency and cut costs
  - Competition (or appropriate regulation) would force efficiency and productivity gains to be passed through to prices
  - Consumers would therefore enjoy better service and lower prices, while profits could rise under an SOE or private model – sharing the gains from more productive use of resources

The outcome 1986-2018

- Productivity is down 30% over three decades
- Prices for residential consumers have doubled in real terms
- Prices for industry are up just a couple of percent
- Prices for commercial users are down by a quarter
- Gross profits are up 80%

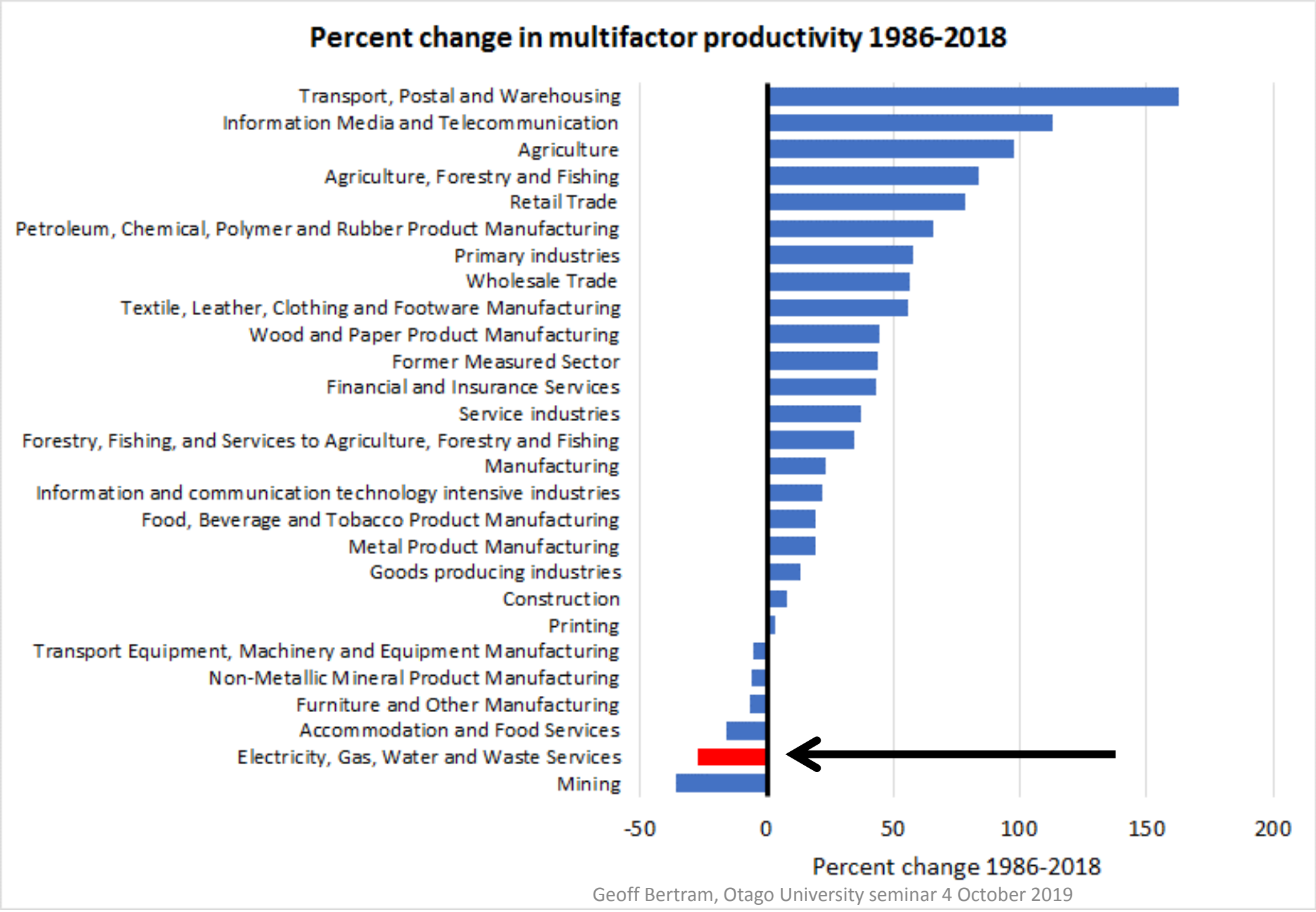
My interpretation of these outcomes

High profits have come not from efficiency gains but from price-gouging residential consumers, under cover of entrenched market power, while the countervailing power of big business has protected industrial and commercial users.

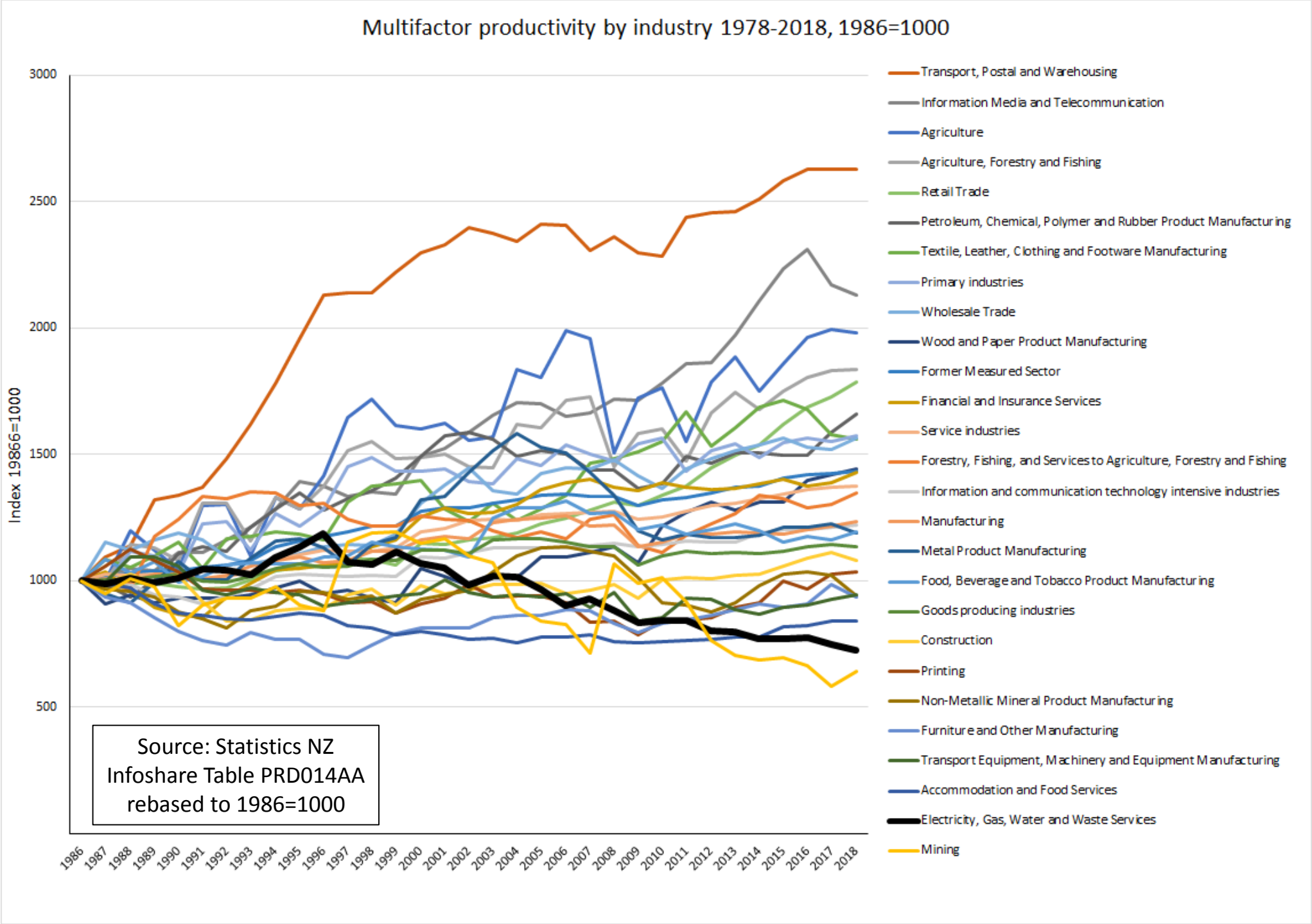
In other words, the big promise was hollow.

First, the data, starting with productivity

- Productivity is recorded in the national accounts produced by Statistics New Zealand
- We have to work with the aggregated data for “electricity, gas, water and waste services” because electricity is not reported separately.
- But electricity is the dominant component (70-80 percent) of that sector



Source: Statistics New Zealand Infoshare Table PRD014AA (updated February 2019)


Multifactor productivity by industry 1978-2018, 1986=1000
Index 19866=1000
3000
2500
2000
1500
1000
500
1986
1987
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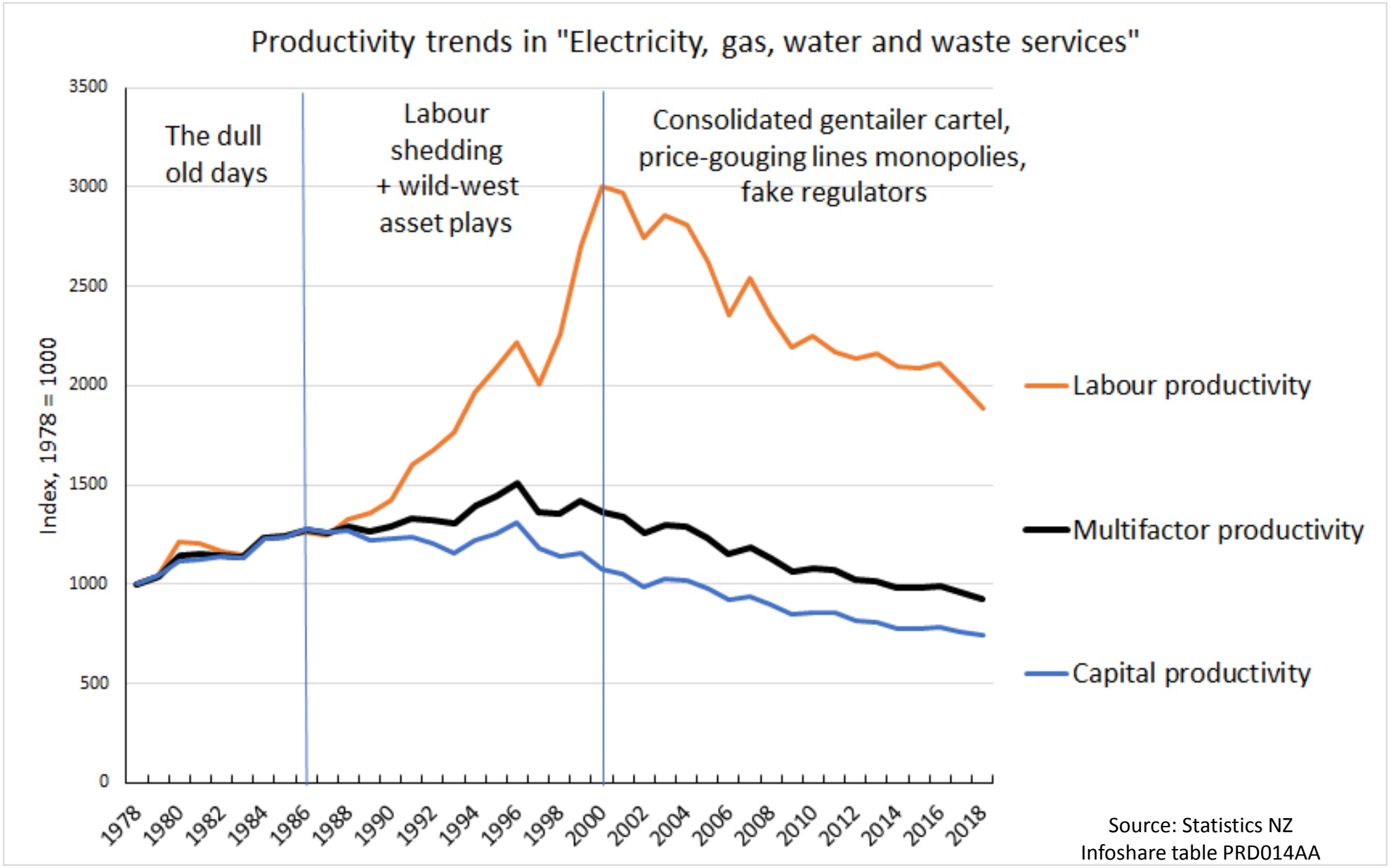
2013
2014
2015
2016
2017
2018
Source: Statistics NZ
Infoshare Table PRD014AA
rebased to 1986=1000
Transport, Postal and Warehousing
Information Media and Telecommunication
Agriculture
Agriculture, Forestry and Fishing
Retail Trade
Petroleum, Chemical, Polymer and Rubber Product Manufacturing
Textile, Leather, Clothing and Footware Manufacturing
Primary industries
Wholesale Trade
Wood and Paper Product Manufacturing
Former Measured Sector
Financial and Insurance Services
Service industries
Forestry, Fishing, and Services to Agriculture, Forestry and Fishing
Information and communication technology intensive industries
Manufacturing
Metal Product Manufacturing
Food, Beverage and Tobacco Product Manufacturing
Goods producing industries
Construction
Printing
Non-Metallic Mineral Product Manufacturing
Furniture and Other Manufacturing
Transport Equipment, Machinery and Equipment Manufacturing
Accommodation and Food Services
Electricity, Gas, Water and Waste Services
Mining


Productivity trends in "Electricity, gas, water and waste services"
The dull old days
Labour shedding + wild-west asset plays
Consolidated gentailer cartel, price-gouging lines monopolies, fake regulators
Index, 1978 = 1000
3500
3000
2500
2000
1500
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500
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1978
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1982
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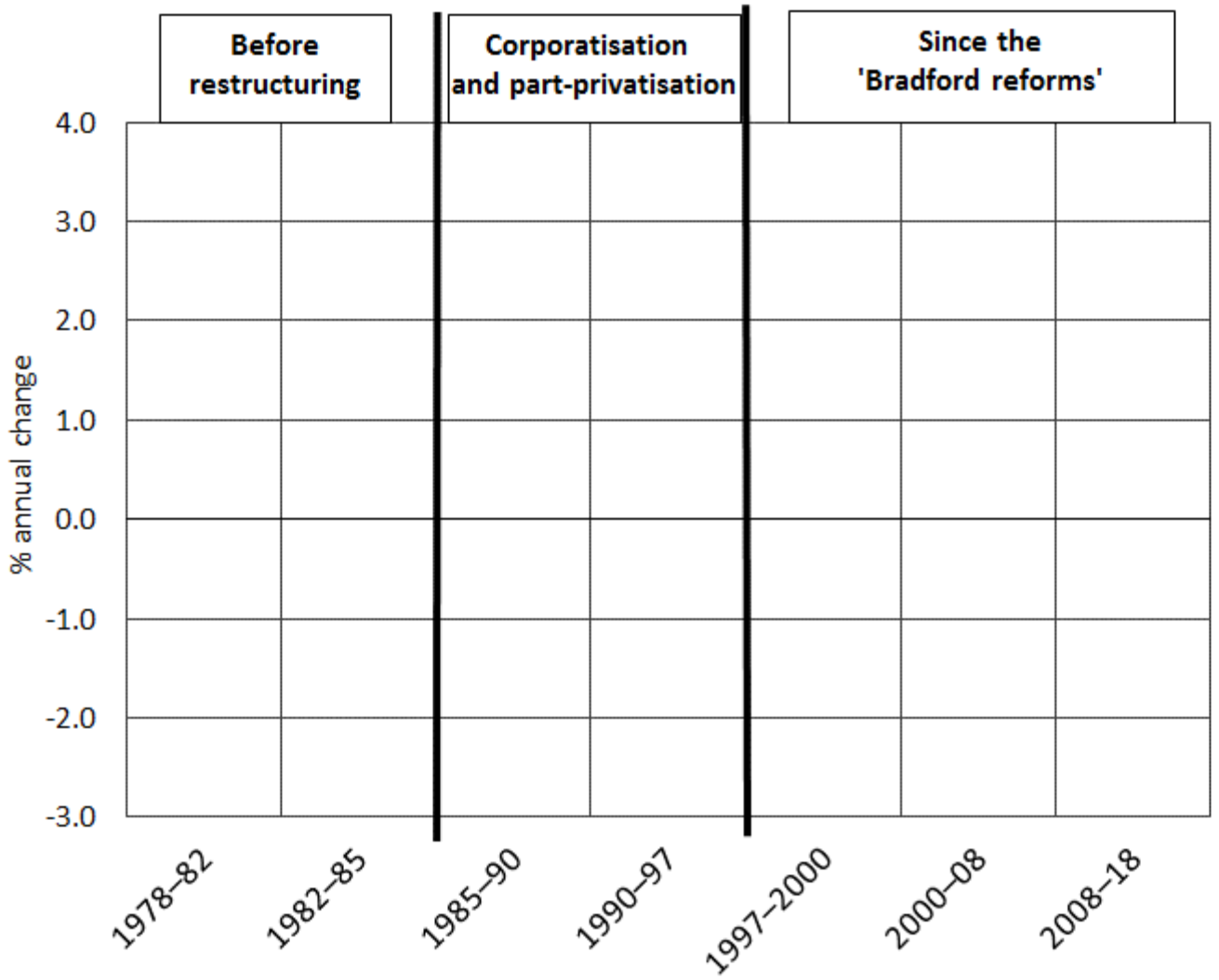
Labour productivity
Multifactor productivity
Capital productivity
Source: Statistics NZ
Infoshare table PRD014AA

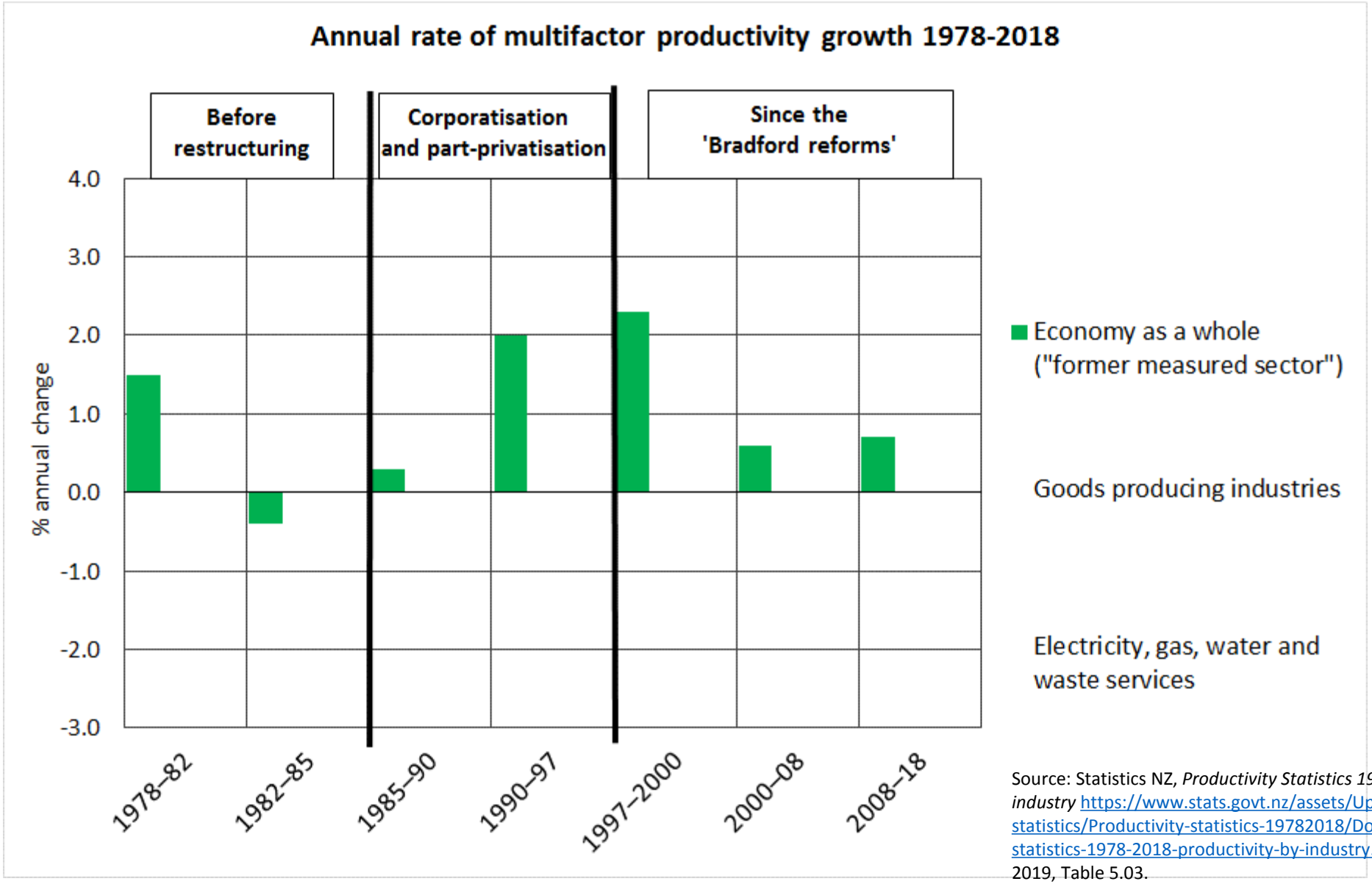
Annual rate of multifactor productivity growth 1978-2018



Economy as a whole ("former measured sector")

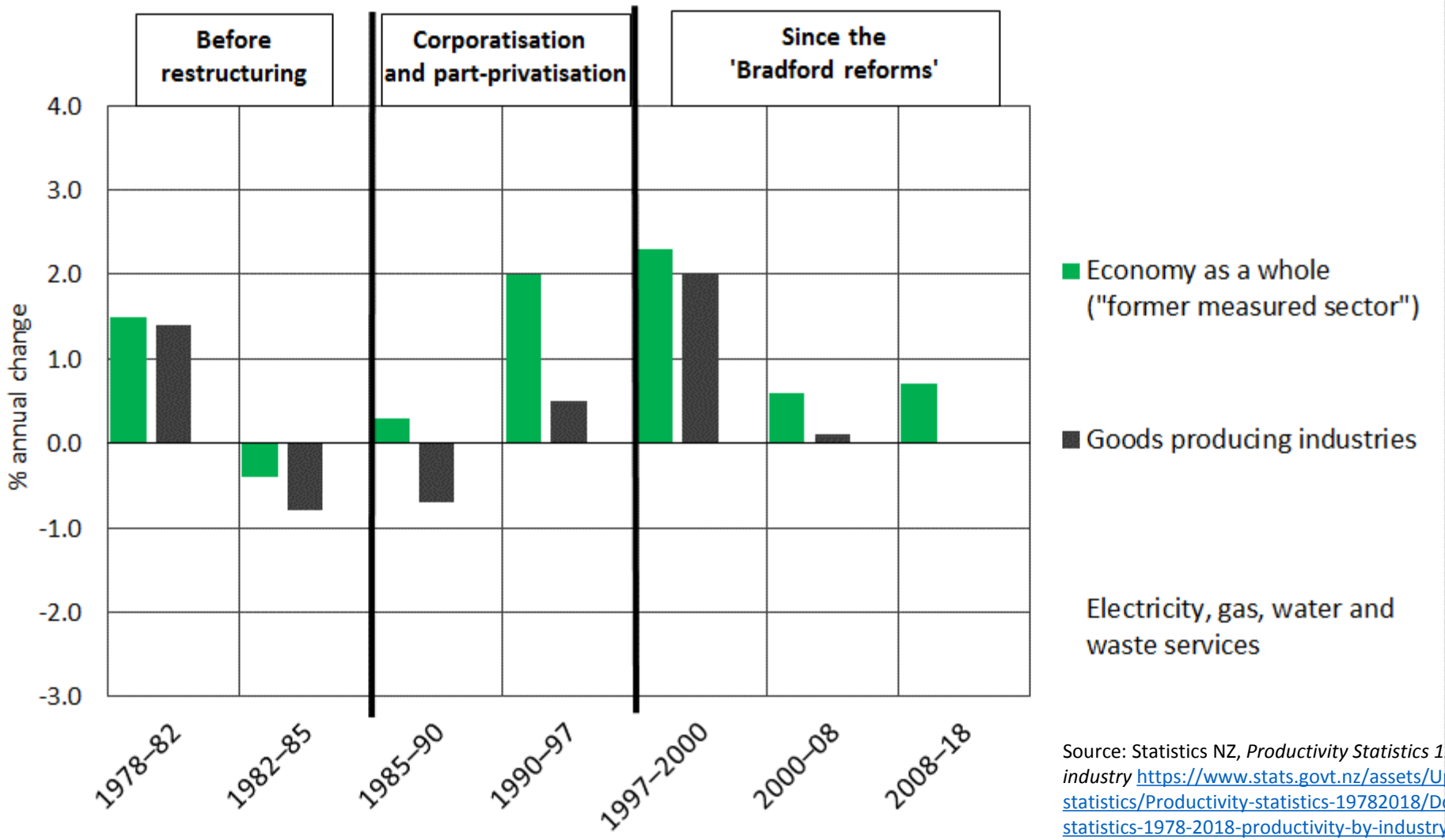
Goods producing industries

Electricity, gas, water and waste services

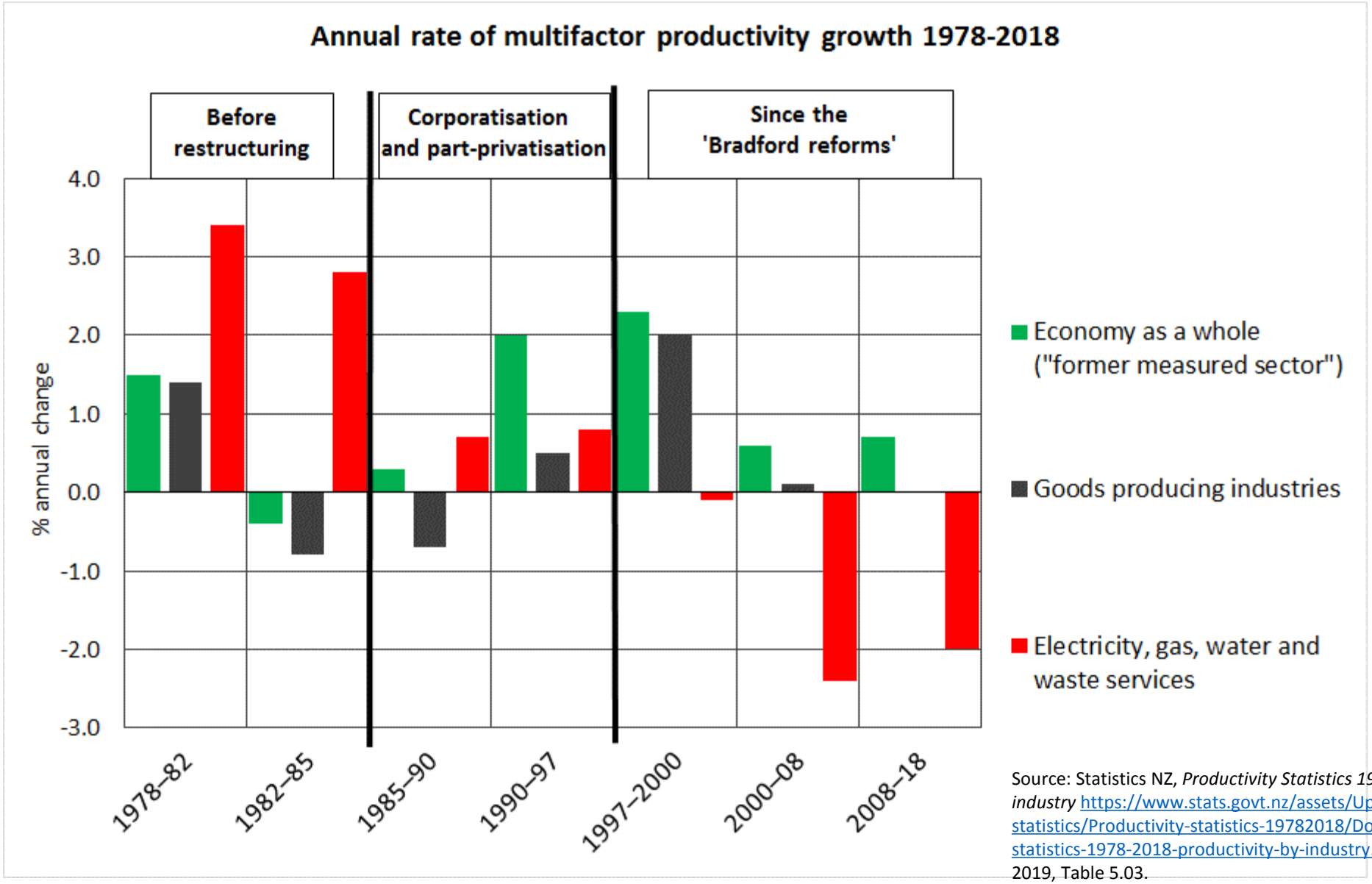


Source: Statistics NZ, *Productivity Statistics 1978-2018 – productivity by industry* https://www.stats.govt.nz/assets/Uploads/Productivity-statistics/Productivity-statistics-19782018/Download-data/productivity-statistics-1978-2018-productivity-by-industry.xlsx accessed 20 May 2019, Table 5.03.

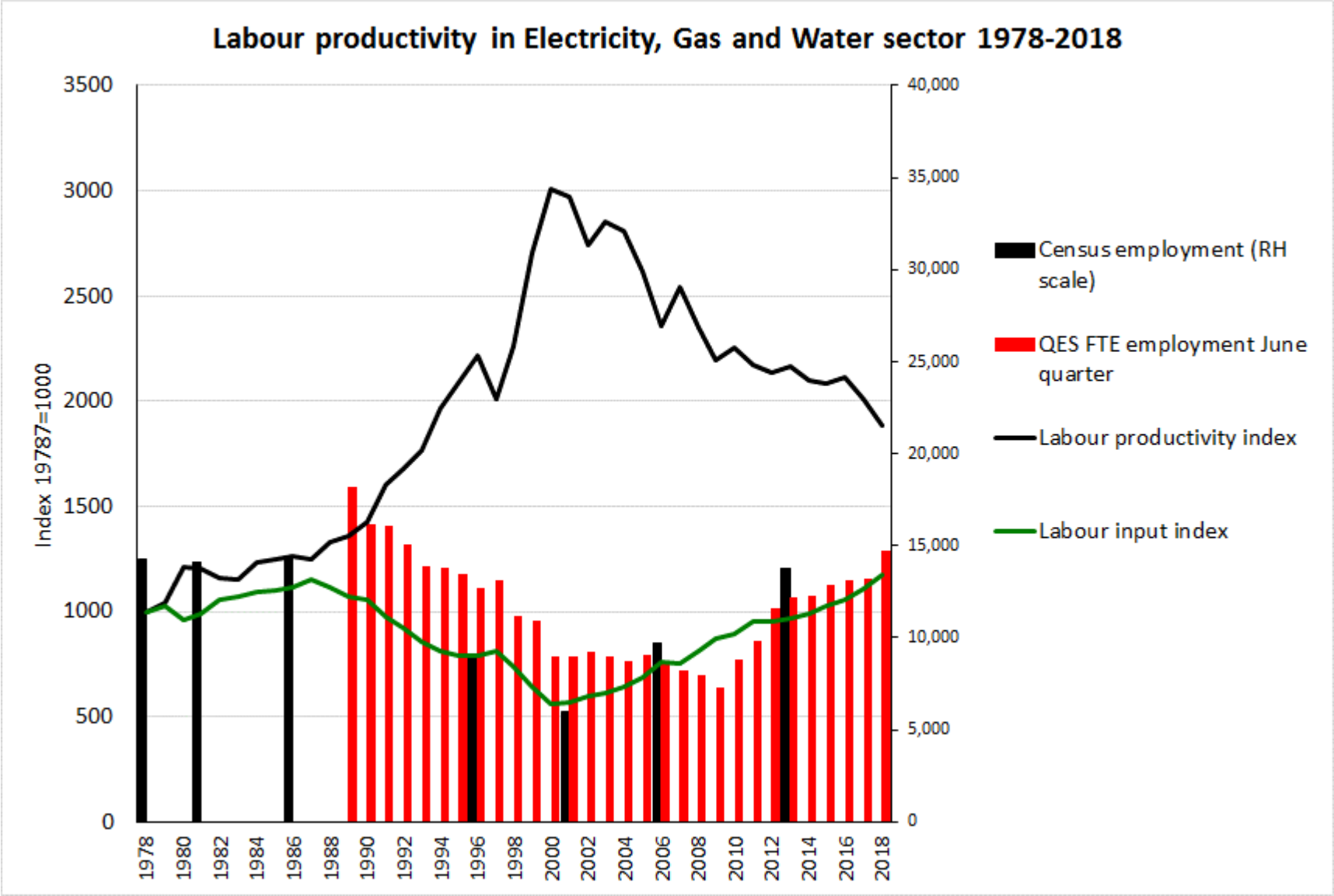
Annual rate of multifactor productivity growth 1978-2018



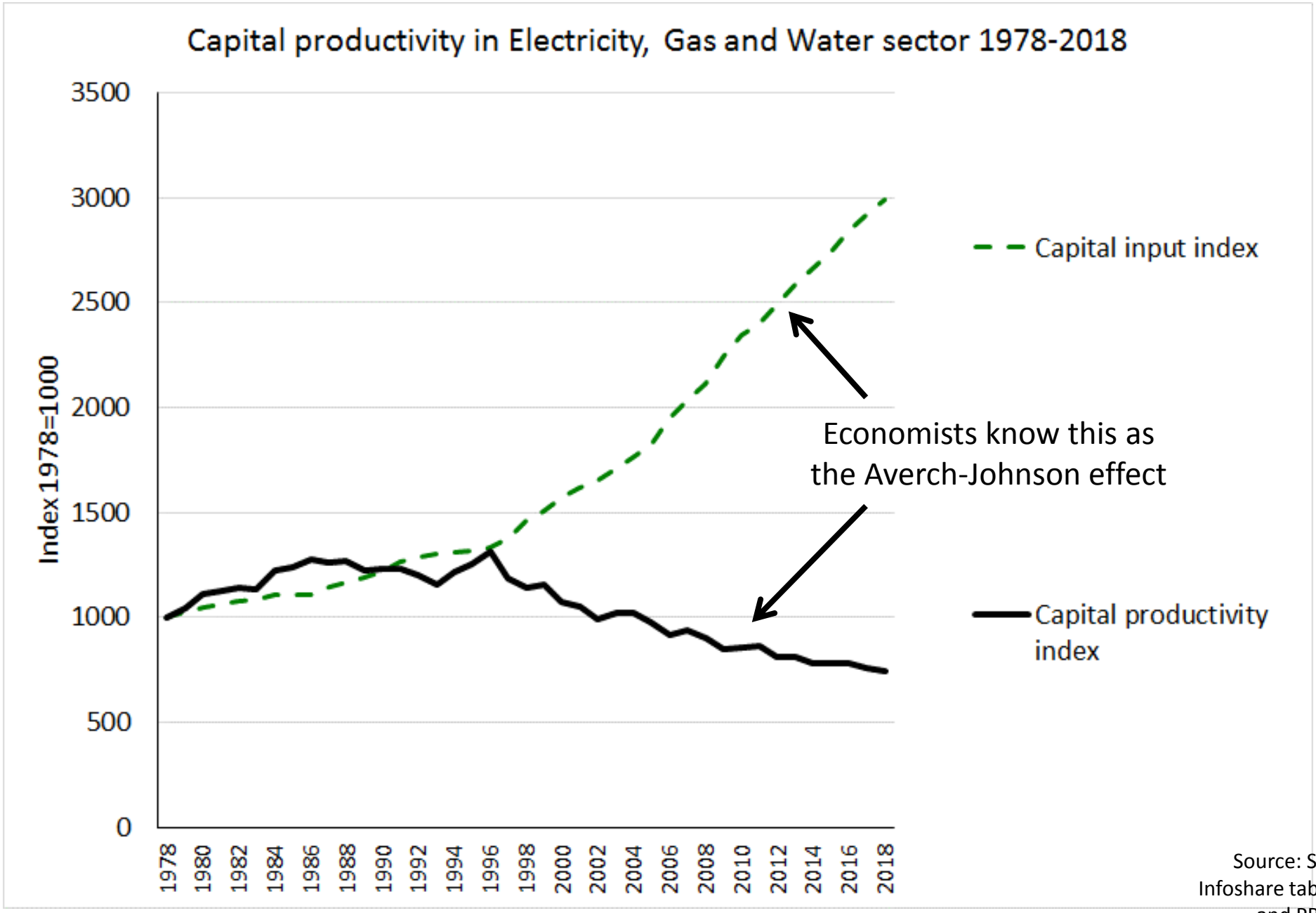
Source: Statistics NZ, *Productivity Statistics 1978-2018 – productivity by industry* https://www.stats.govt.nz/assets/Uploads/Productivity-statistics/Productivity-statistics-19782018/Download-data/productivity-statistics-1978-2018-productivity-by-industry.xlsx accessed 20 May 2019, Table 5.03.



Source: Statistics NZ, *Productivity Statistics 1978-2018 – productivity by industry* https://www.stats.govt.nz/assets/Uploads/Productivity-statistics/Productivity-statistics-19782018/Download-data/productivity-statistics-1978-2018-productivity-by-industry.xlsx accessed 20 May 2019, Table 5.03.



Sources: Statistics NXZ
Infoshare tables PRD016AA
and PRD014AA.
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.



Source: Statistics NZ Infoshare tables PRD016AA and PRD014AA

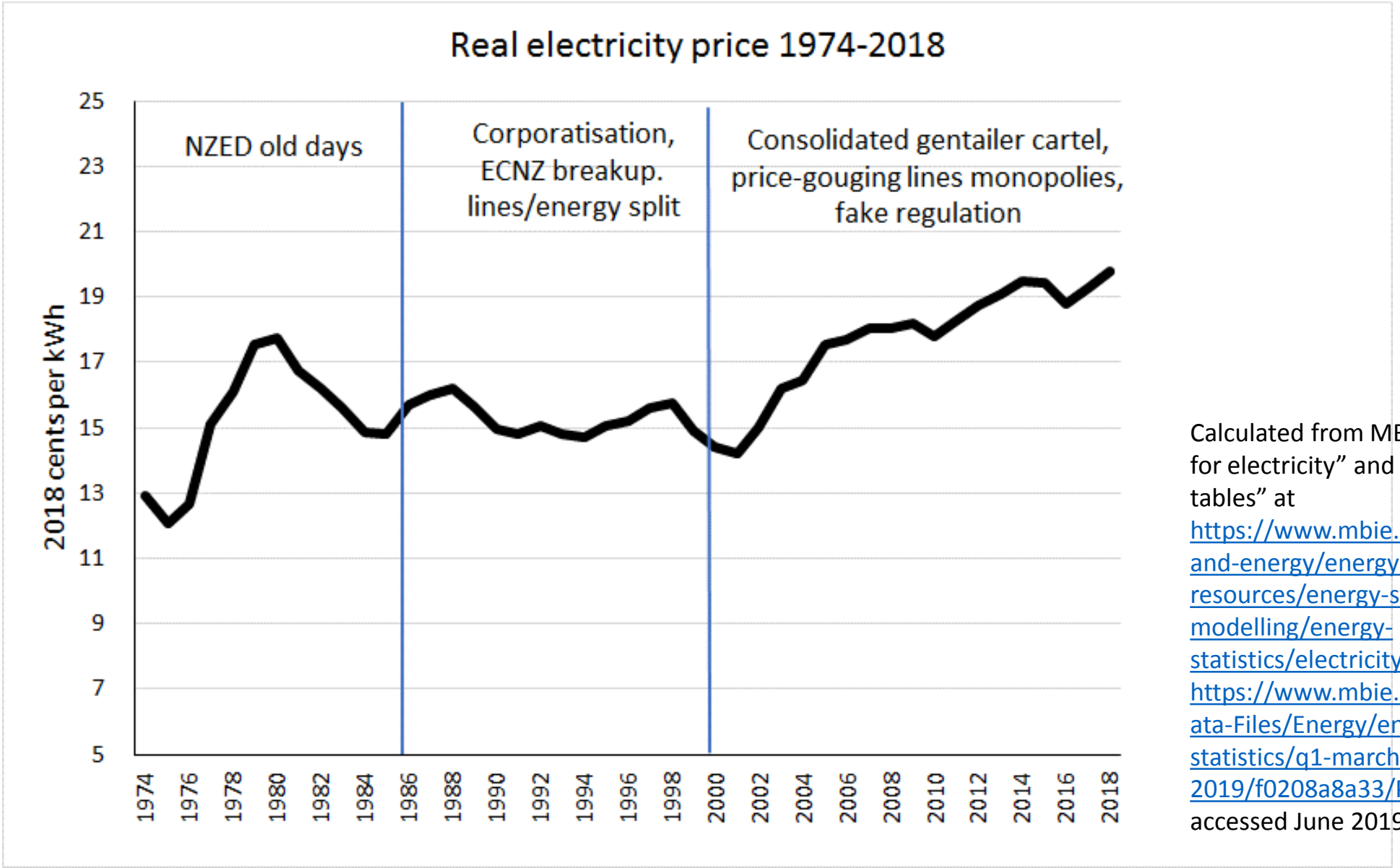
Bottom line: over the past two decades this sector has been loaded up with labour and capital engaged in unproductive activities

- 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

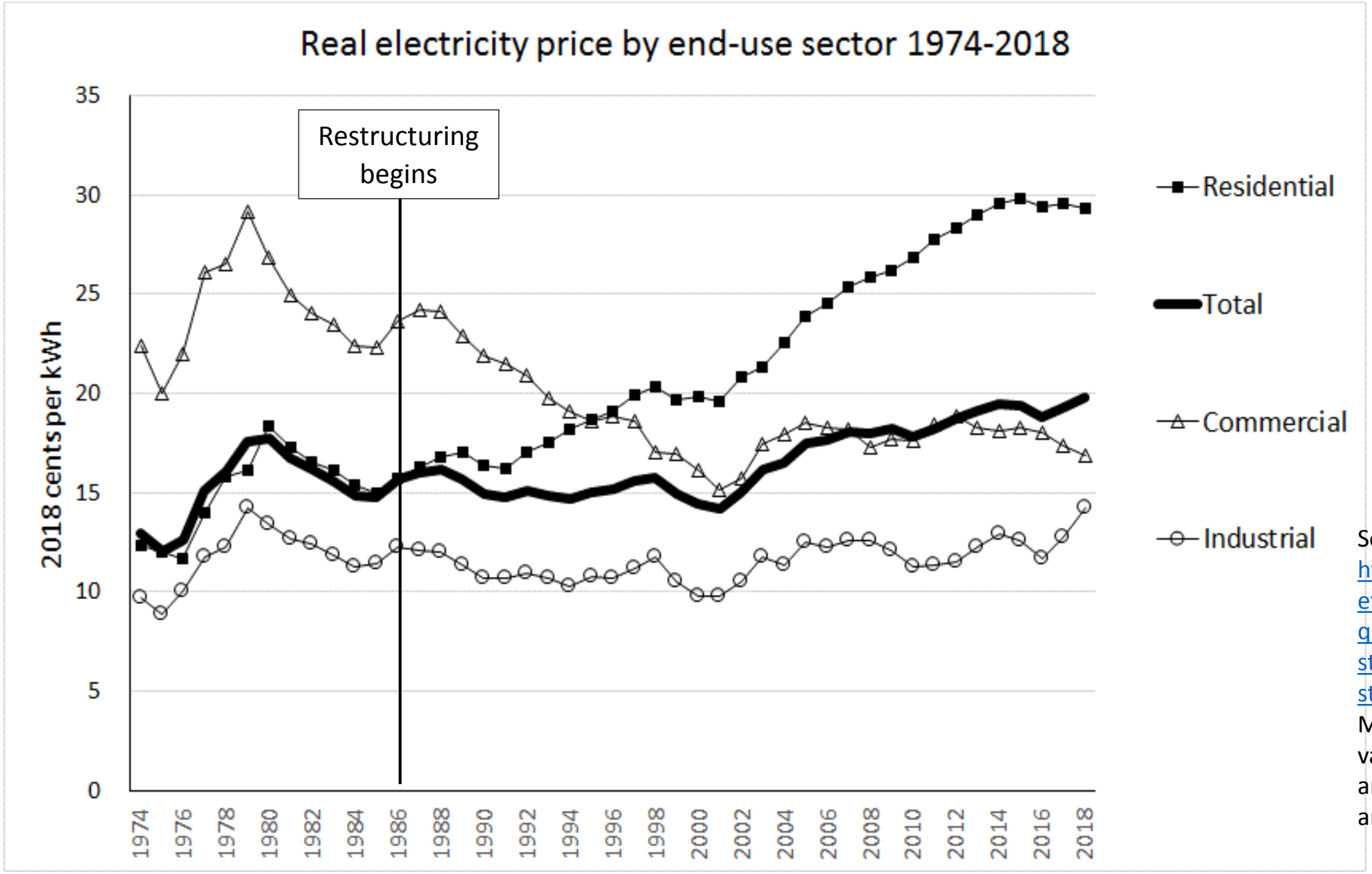
- Corporatisation and privatisation have culminated in a gigantic exercise in rent-seeking waste

Turn now to price

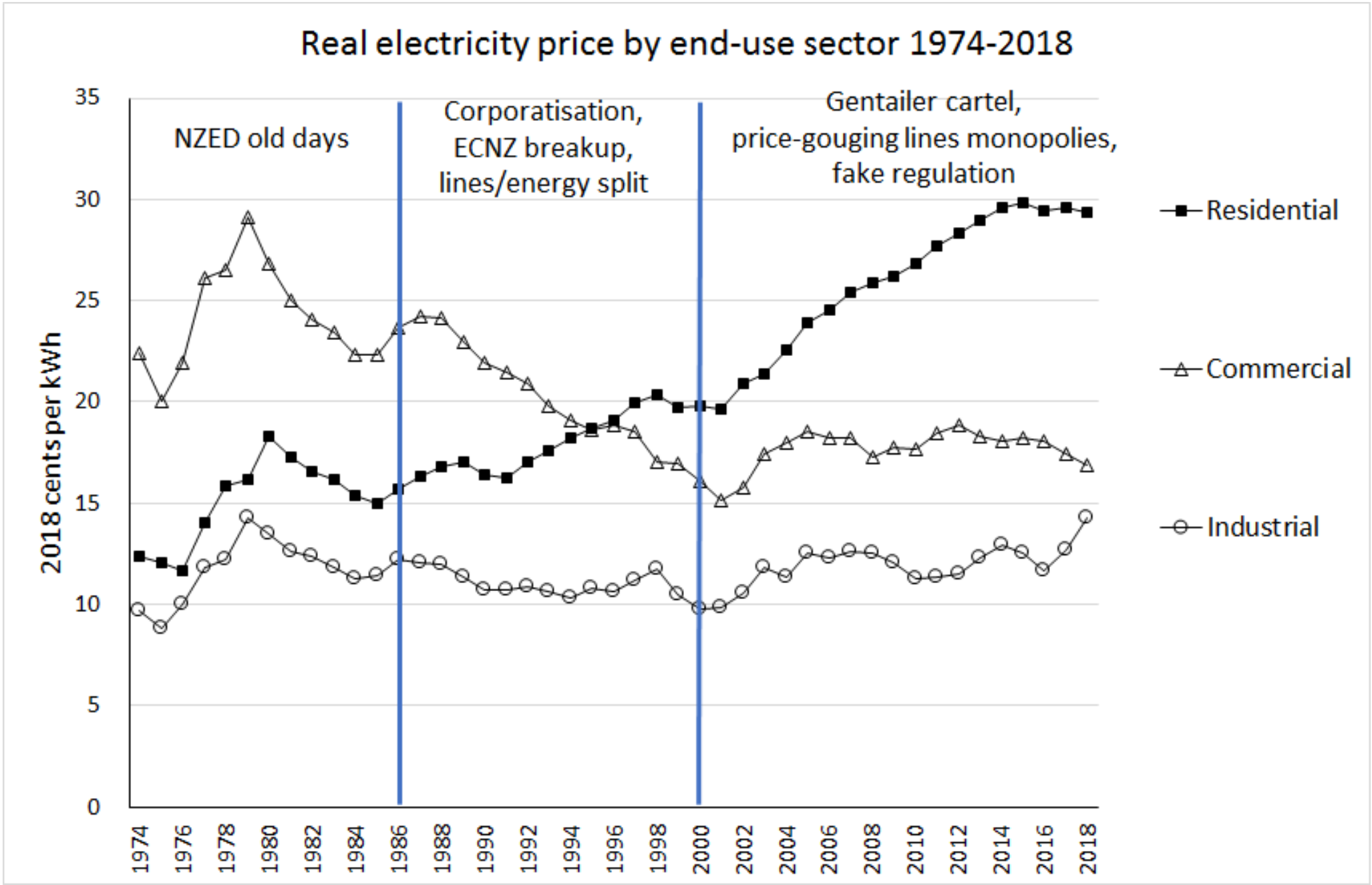
- First the average across all users
- Then the specific changes by sector



Calculated from MBIE 'Data tables for electricity" and "energy price tables" at https://www.mbie.govt.nz/building-and-energy/energy-and-natural-resources/energy-statistics-and-modelling/energy-statistics/electricity-statistics/ and https://www.mbie.govt.nz/assets/Data-Files/Energy/energy-quarterly-statistics/q1-march-2019/f0208a8a33/Prices.xlsx accessed June 2019.



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 2018 values using CPI for residential and PPI Inputs for commercial and industrial.


Real electricity price by end-use sector 1974-2018
NZED old days
Corporatisation, ECNZ breakup, lines/energy split
Gentailer cartel, price-gouging lines monopolies, fake regulation
2018 cents per kWh
0
5
10
15
20
25
30
35
1974
1976
1978
1980
1982
1984
1986
1988
1990
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1998
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2002
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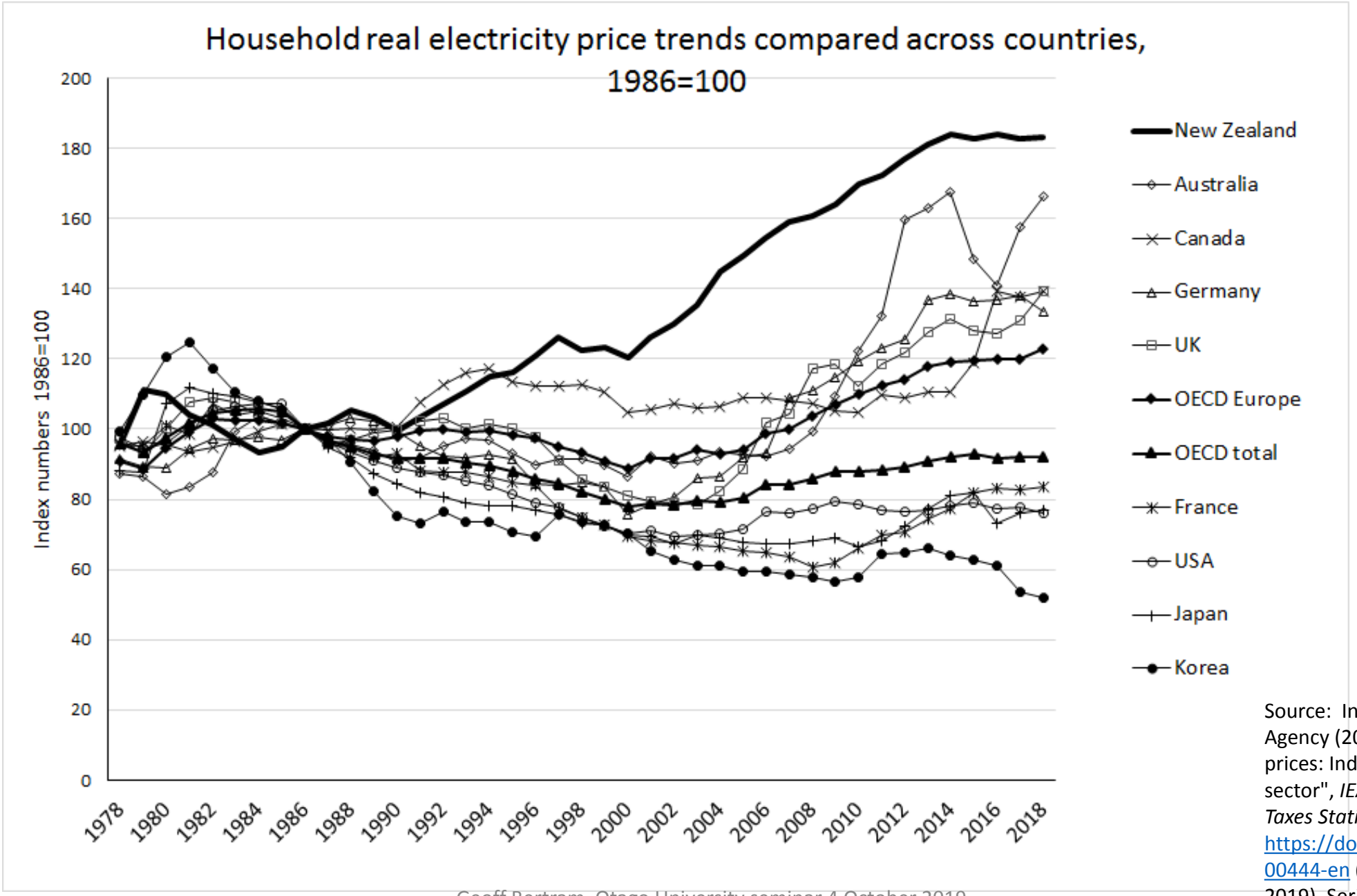
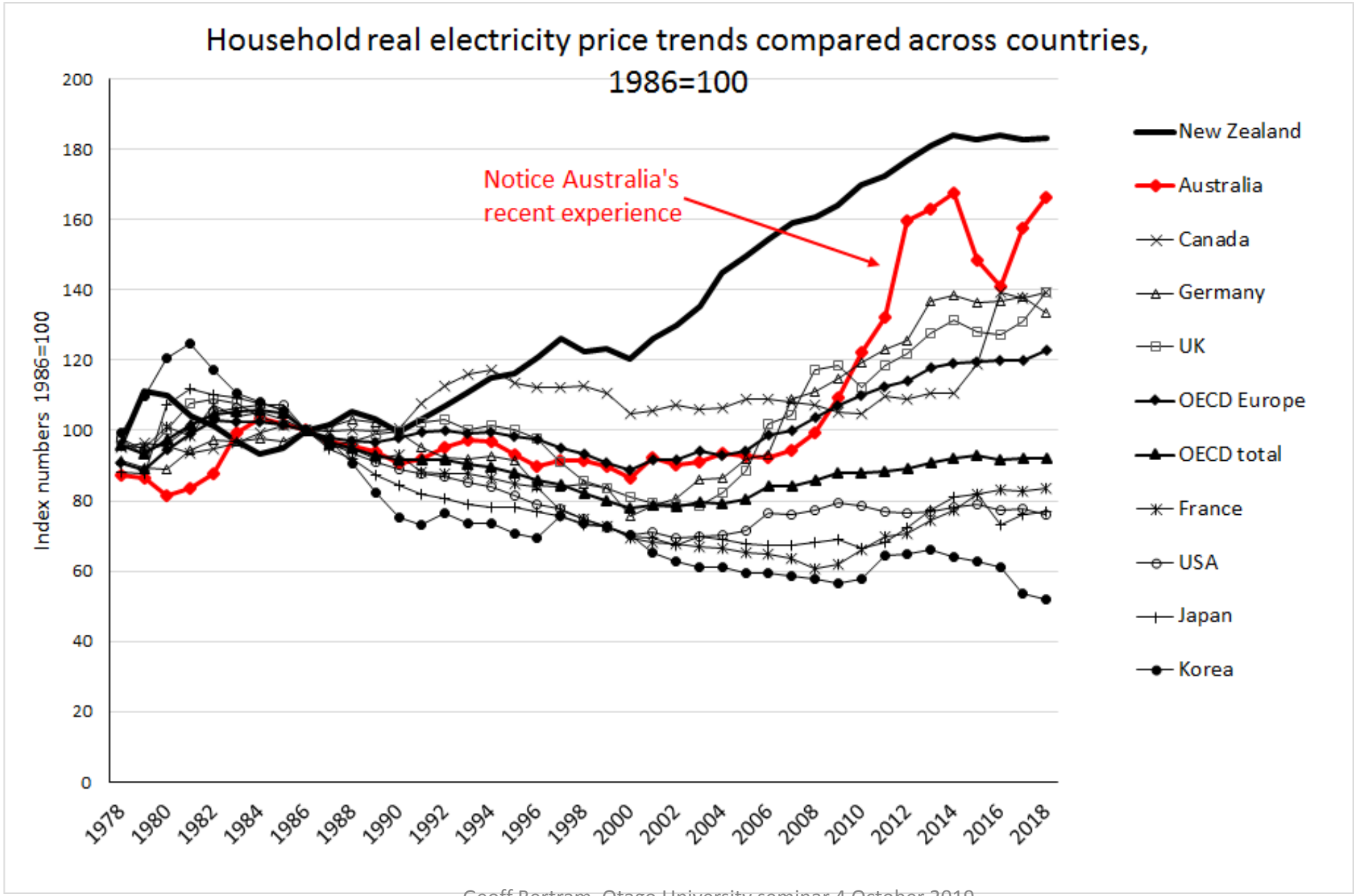
2008
2010
2012
2014
2016
2018
Residential
Commercial
Industrial

and comparing with other OECD countries



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.


Household real electricity price trends compared across countries, 1986=100
Index numbers 1986=100
Notice Australia's recent experience
New Zealand
Australia
Canada
Germany
UK
OECD Europe
OECD total
France
USA
Japan
Korea
200
180
160
140
120
100
80
60
40
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Moving on from index numbers, compare different countries' residential prices

OECD data show residential prices in US dollars per MWh at purchasing power parity

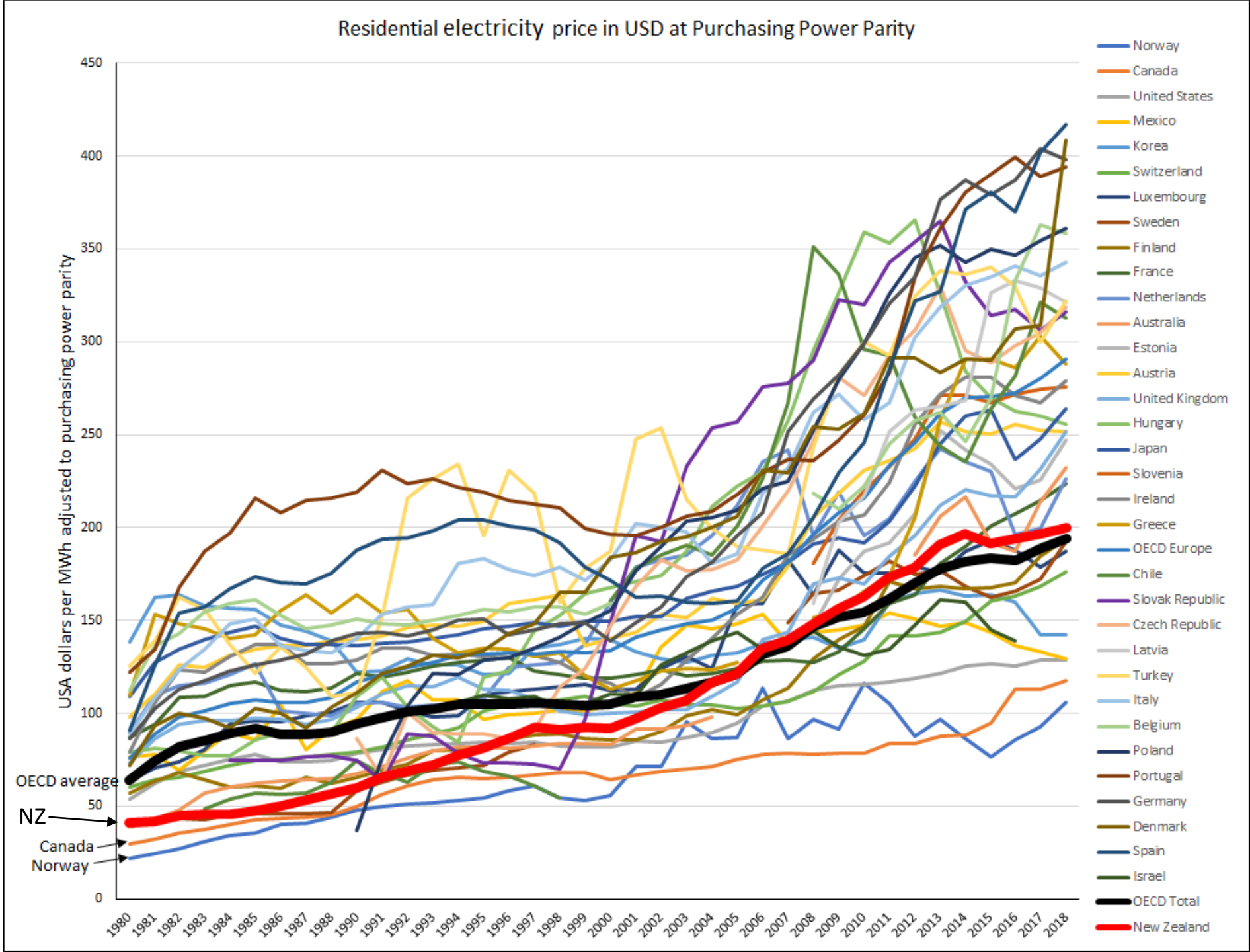
This is of interest because the Electricity Price Inquiry and MBIE are talking loudly about "10th lowest residential prices in the OECD".

That was 2017 – in 2018 New Zealand had dropped another place, to 11^{th}.

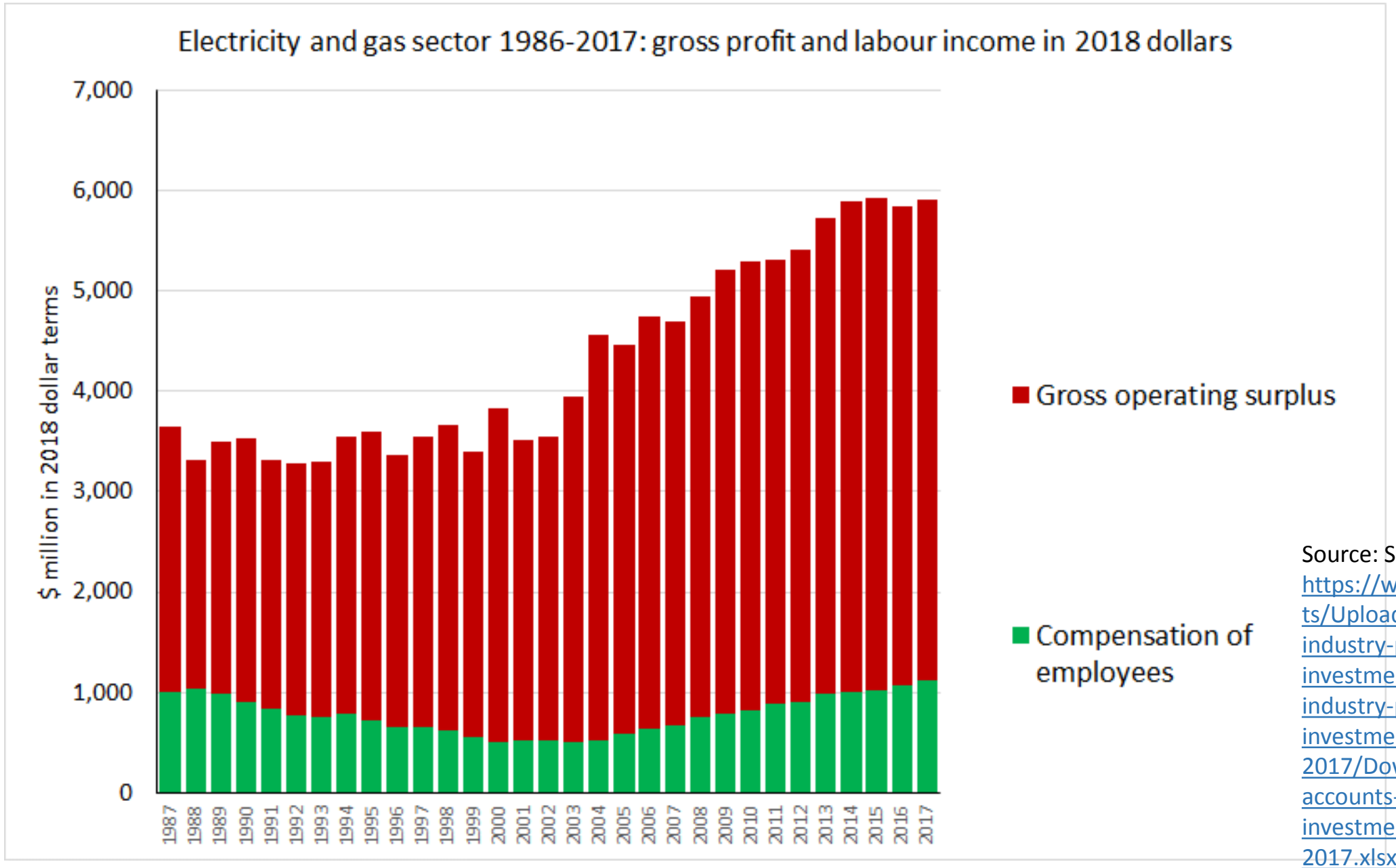
The key point here is that New Zealand used to be the third lowest, at 64% of the OECD average price.

In 2018 NZ was eleventh lowest, at 103% of the OECD average.

Source: International Energy Agency database accessed 3 October 2019.



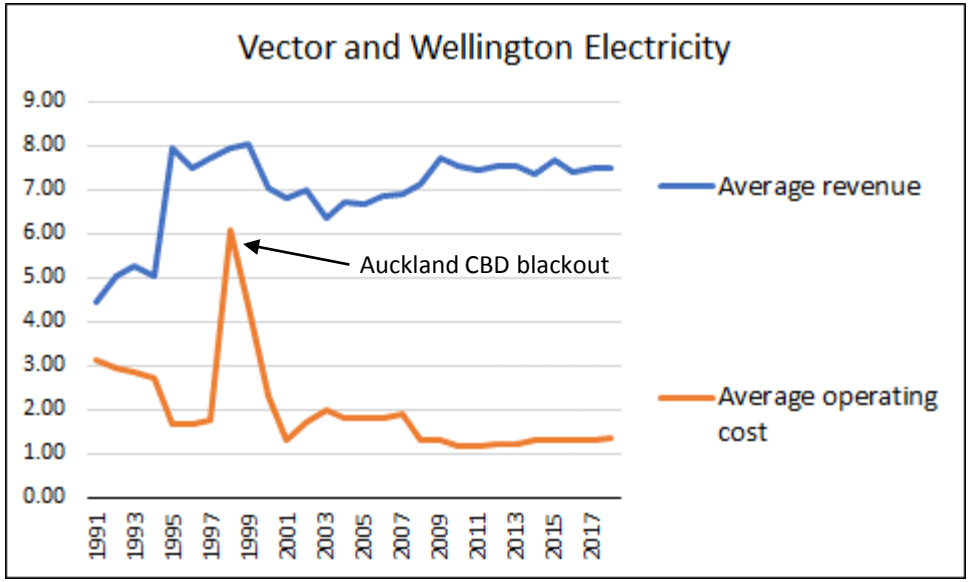
Finally, profits

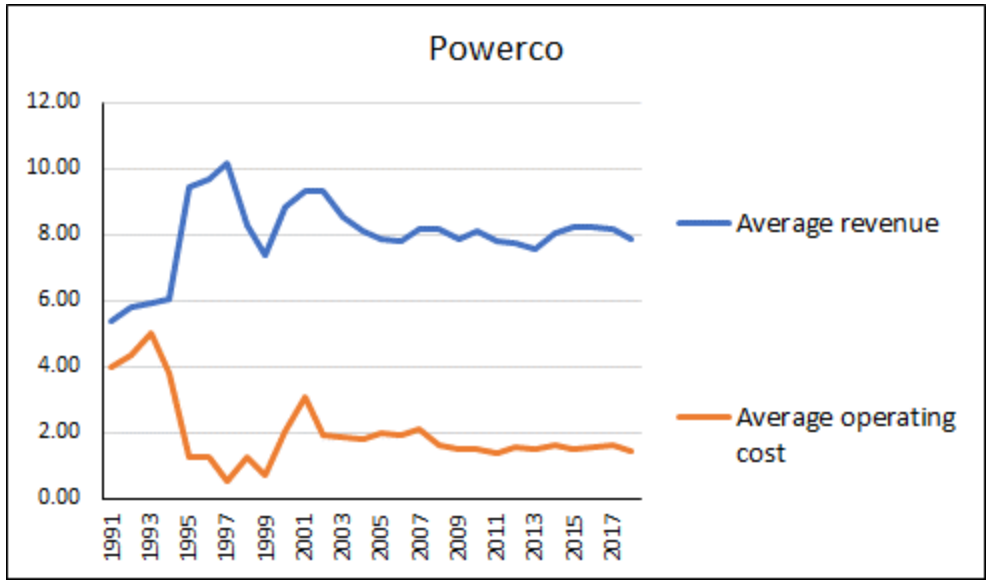


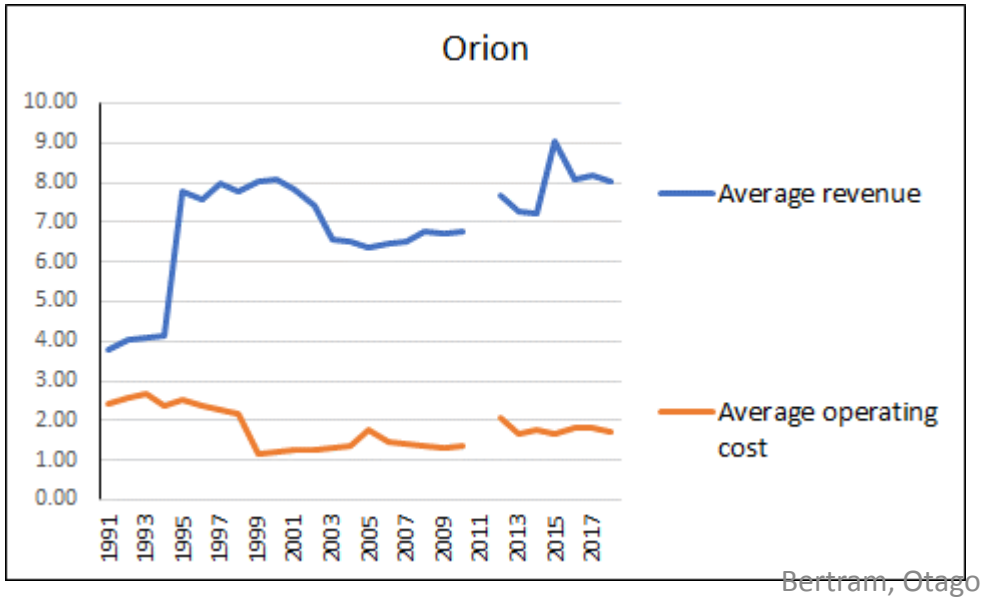
Source: Statistics NZ https://www.stats.govt.nz/assets/Uploads/National-accounts-industry-production-and-investment/National-accounts-industry-production-and-investment-Year-ended-March-2017/Download-data/national-accounts-industry-production-investment-year-ended-march-2017.xlsx downloaded 20 May 2019.

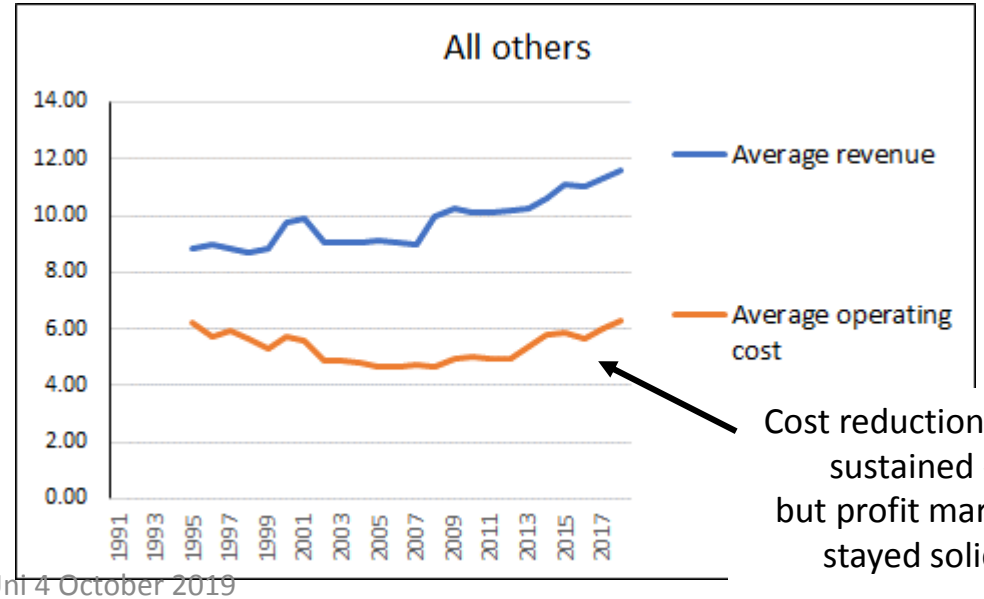
Focusing on the natural-monopoly lines sector, here's the record of increased margins in electricity distribution networks as soon as they were corporatized and partly privatised

All in real terms, 2018 cents per kWh

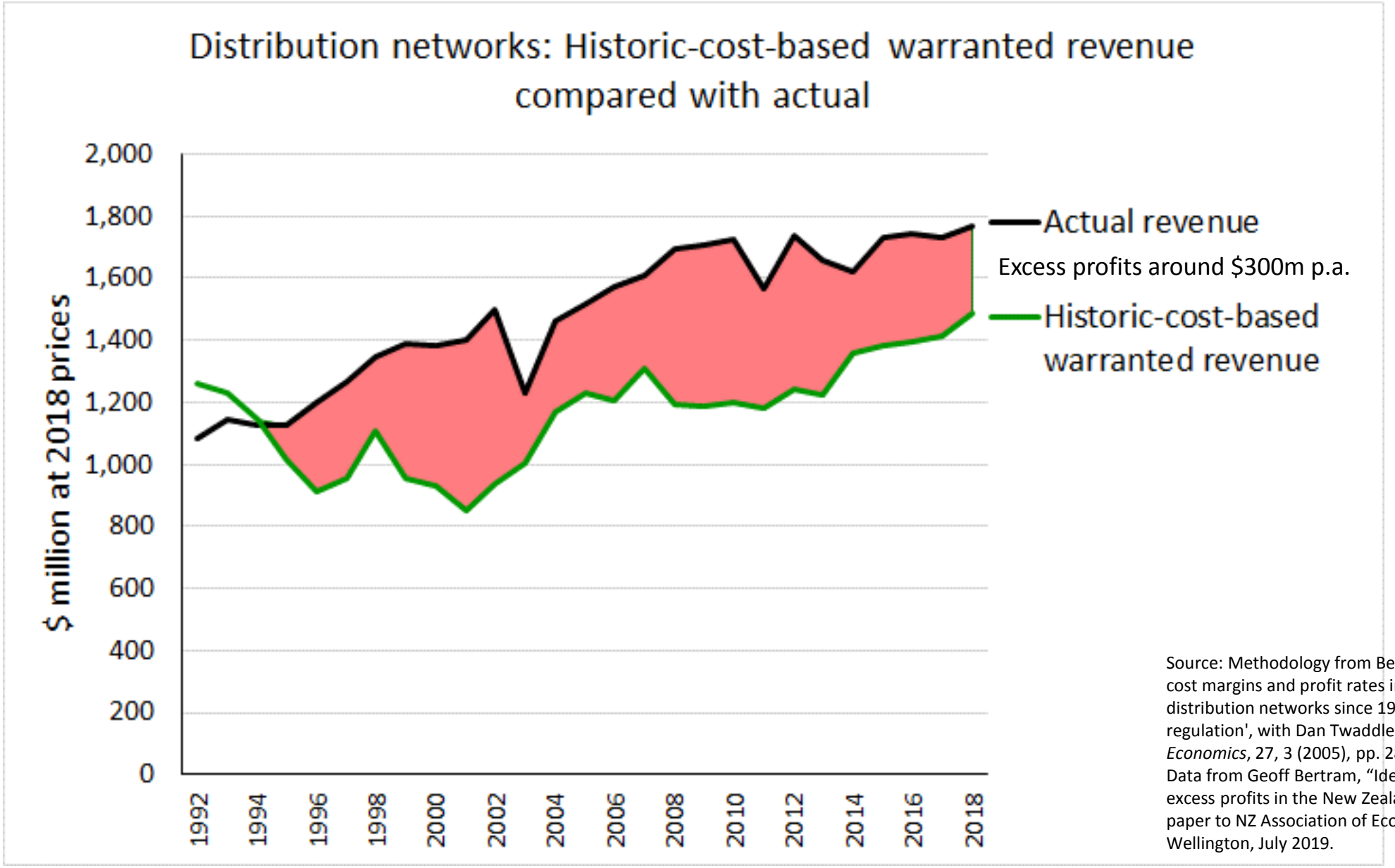








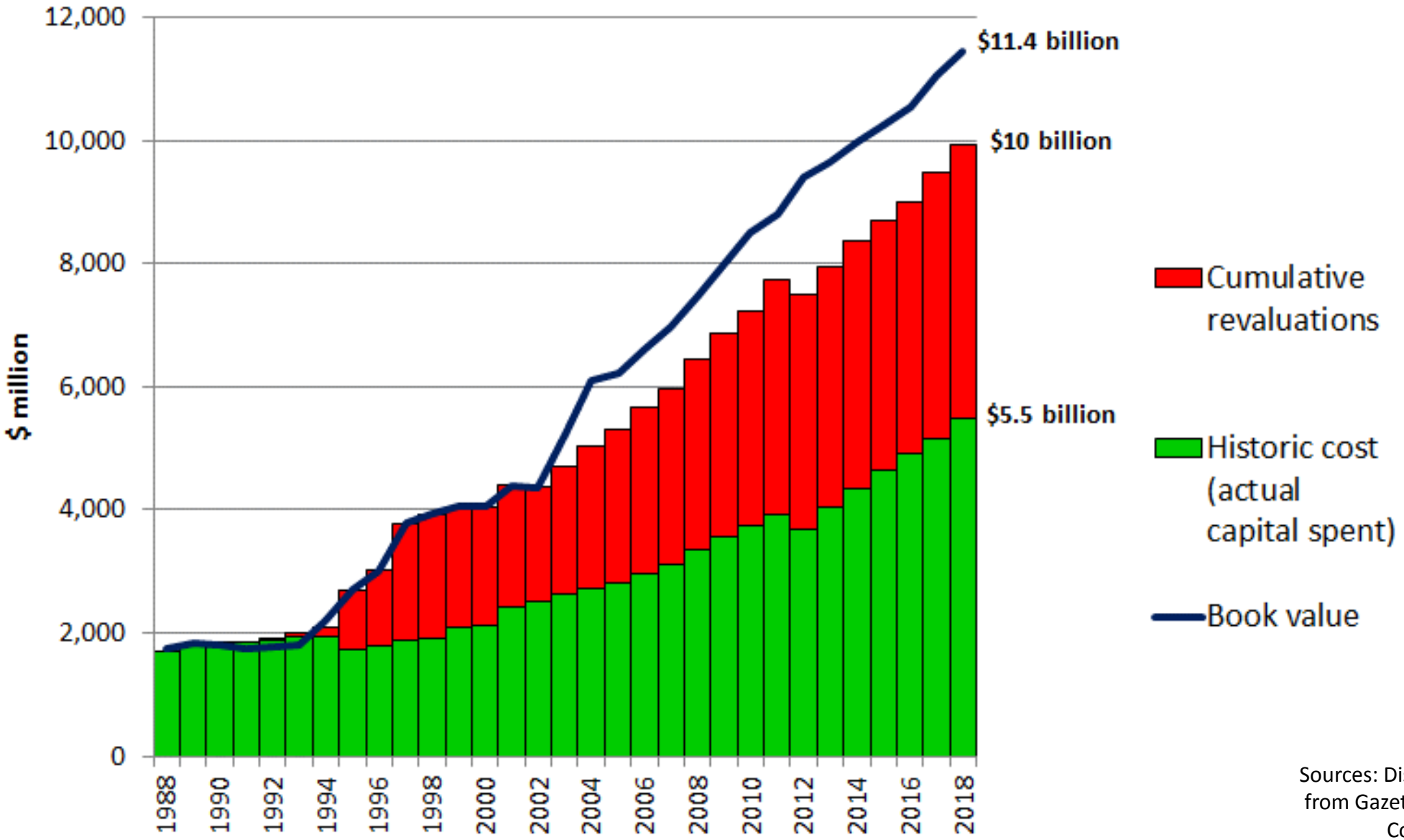
Cost reductions not sustained -
but profit margins stayed solid



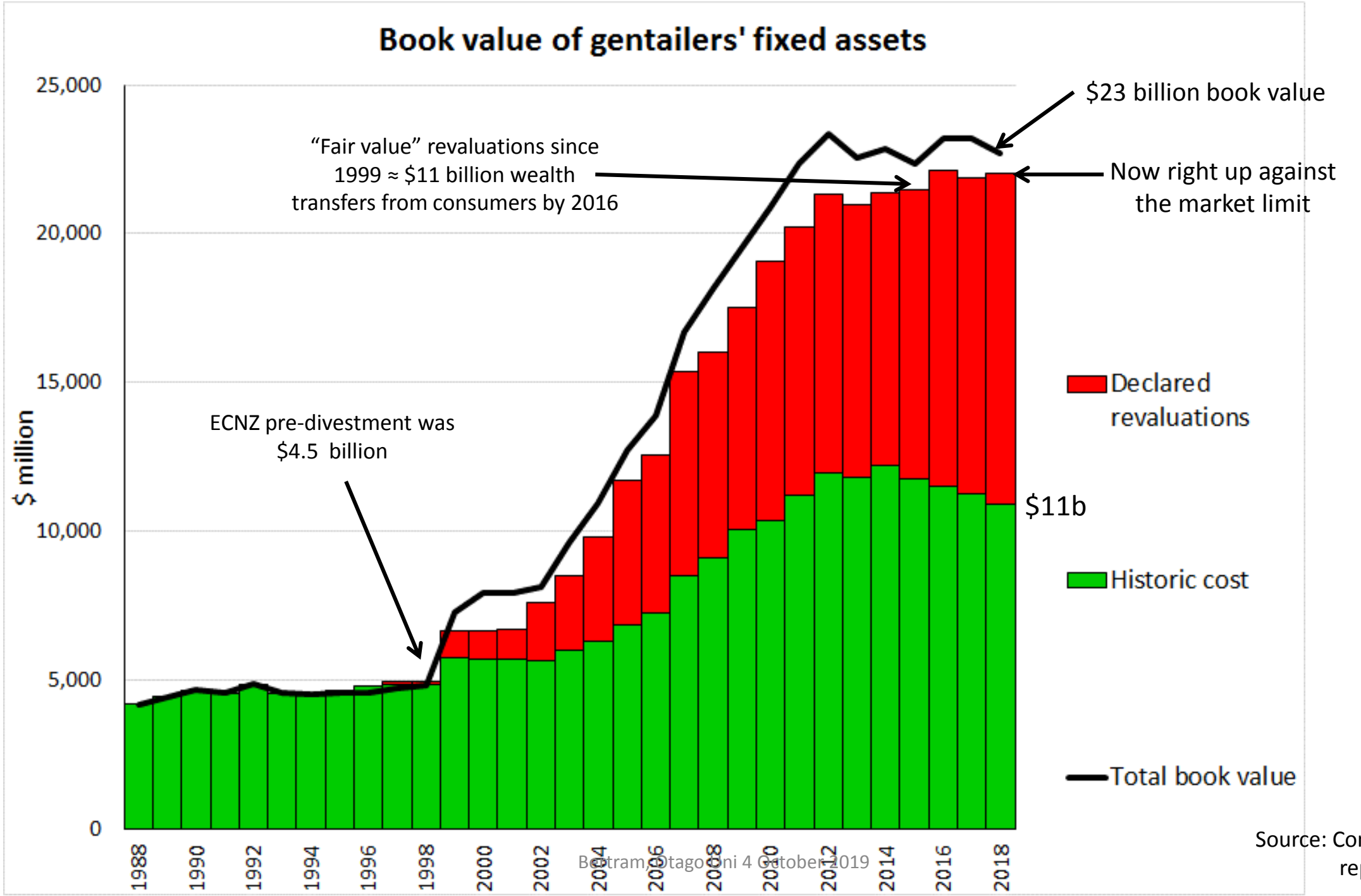
Source: Methodology from Bertram and Twaddle'Price-cost margins and profit rates in New Zealand electricity distribution networks since 1994: the cost of light handed regulation', with Dan Twaddle, *Journal of Regulatory Economics*, 27, 3 (2005), pp. 281-307.
Data from Geoff Bertram, "Identifying and estimating excess profits in the New Zealand electricity industry", paper to NZ Association of Economists Conference, Wellington, July 2019.

High and rising profits show up as asset revaluations under the “fair value” accounting doctrine

Supply authorities/lines companies fixed assets book value

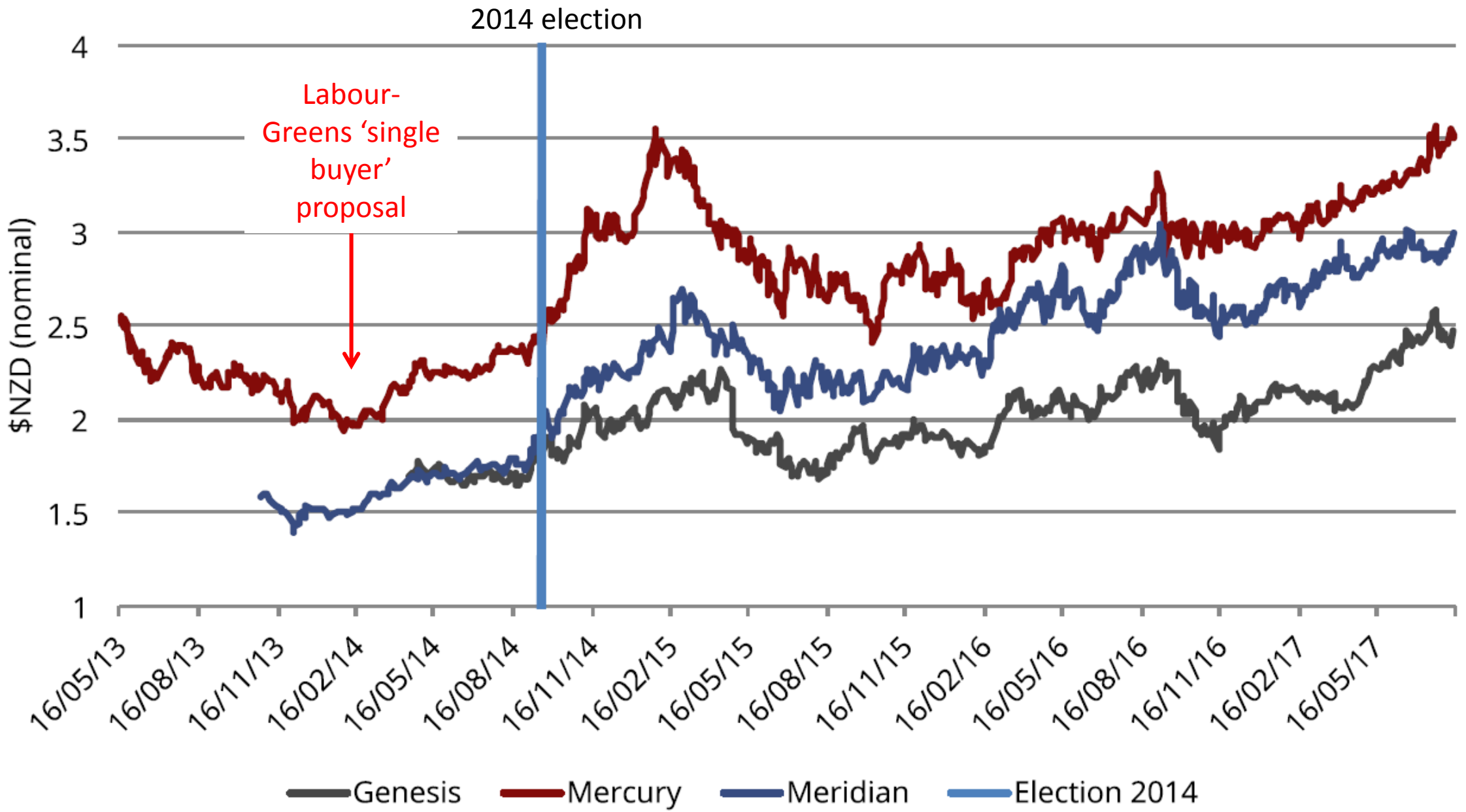


Sources: Disclosed information from Gazettes and Commerce Commission



Source: Company annual reports

Figure 2: Share price - Mercury, Meridian, Genesis



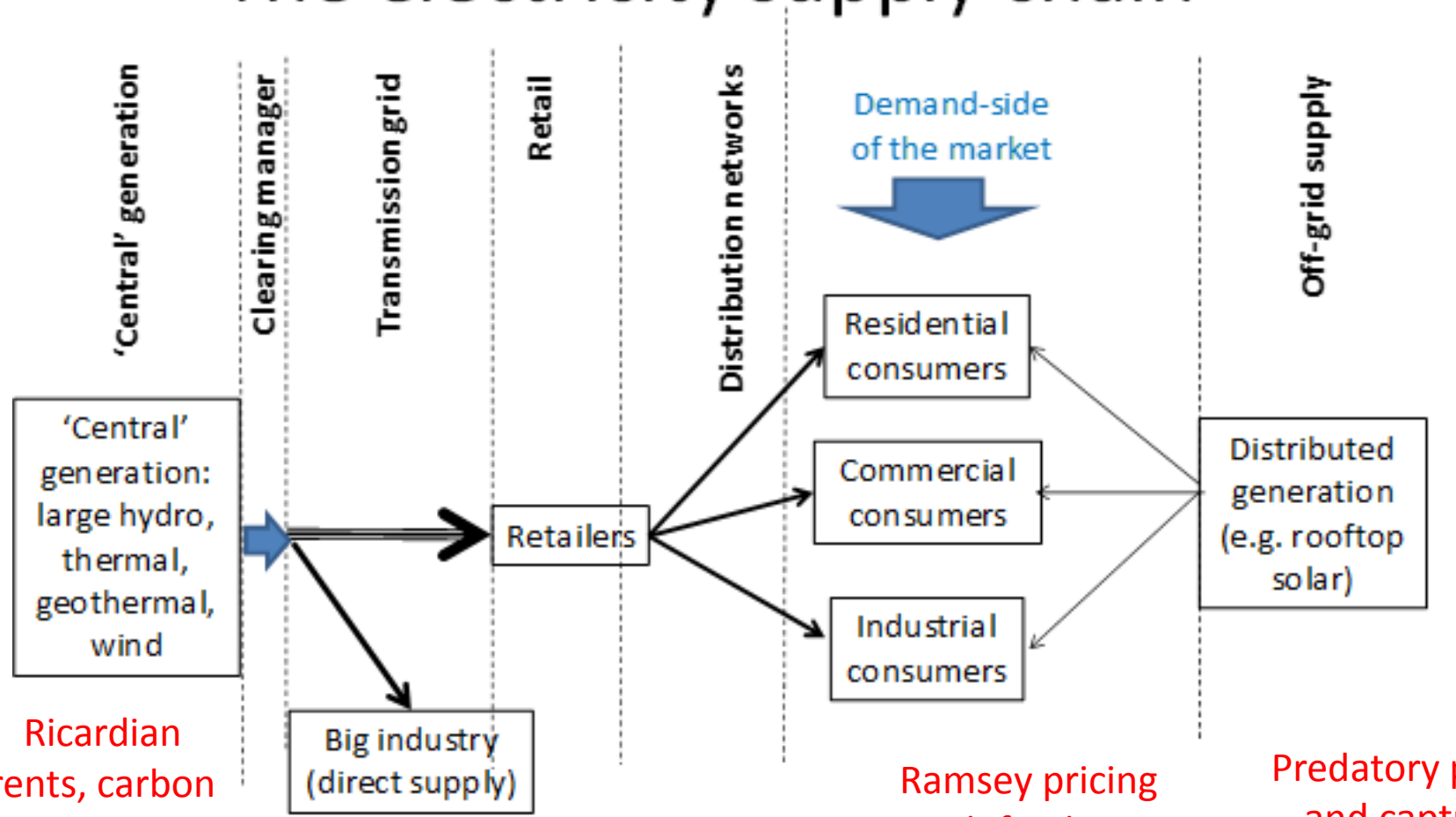
These are the sort of data that the Electricity Price Review could have looked at

- There's plenty more, too, to suggest that the sector is underperforming, over-rewarded, and focused in gouging its revenue from the most defenceless group of electricity customers – residentials, and especially low-income residentials

- None of this made it to the May 2019 Review report though, nor the Government's response yesterday. The review claimed to have found "no evidence" of excessive profits, though admitting they didn't have enough information to reach a firm conclusion

Where can excess profits arise?

The electricity supply chain



Ricardian rents, carbon rents, market manipulation rents

Natural monopoly rents

Vertical integration rents

Natural monopoly (revaluation) rents

Ramsey pricing shifts the burden onto residential consumers

Predatory pricing and captured regulators combine to obstruct rooftop solar etc

In summary

- Multifactor productivity has gone down 30% (and capital productivity down 42%) since 1986
- Residential prices have gone up 90% since 1986 (while industrial prices hardly changed, and commercial prices fell 25%)
- Operating surplus has gone up 81% in real dollars since 1986 (compared with a 12% real increase in labour income)
- Redistribution of wealth from residential consumers to electricity asset owners and commercial users has been massive => increasing inequality and poverty (both child poverty and energy poverty in general)
- Residential consumers have gone from having no choice in a low-priced market to having lots of so-called “choice” [but no voice] in a high-priced market

We are, alas, 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."

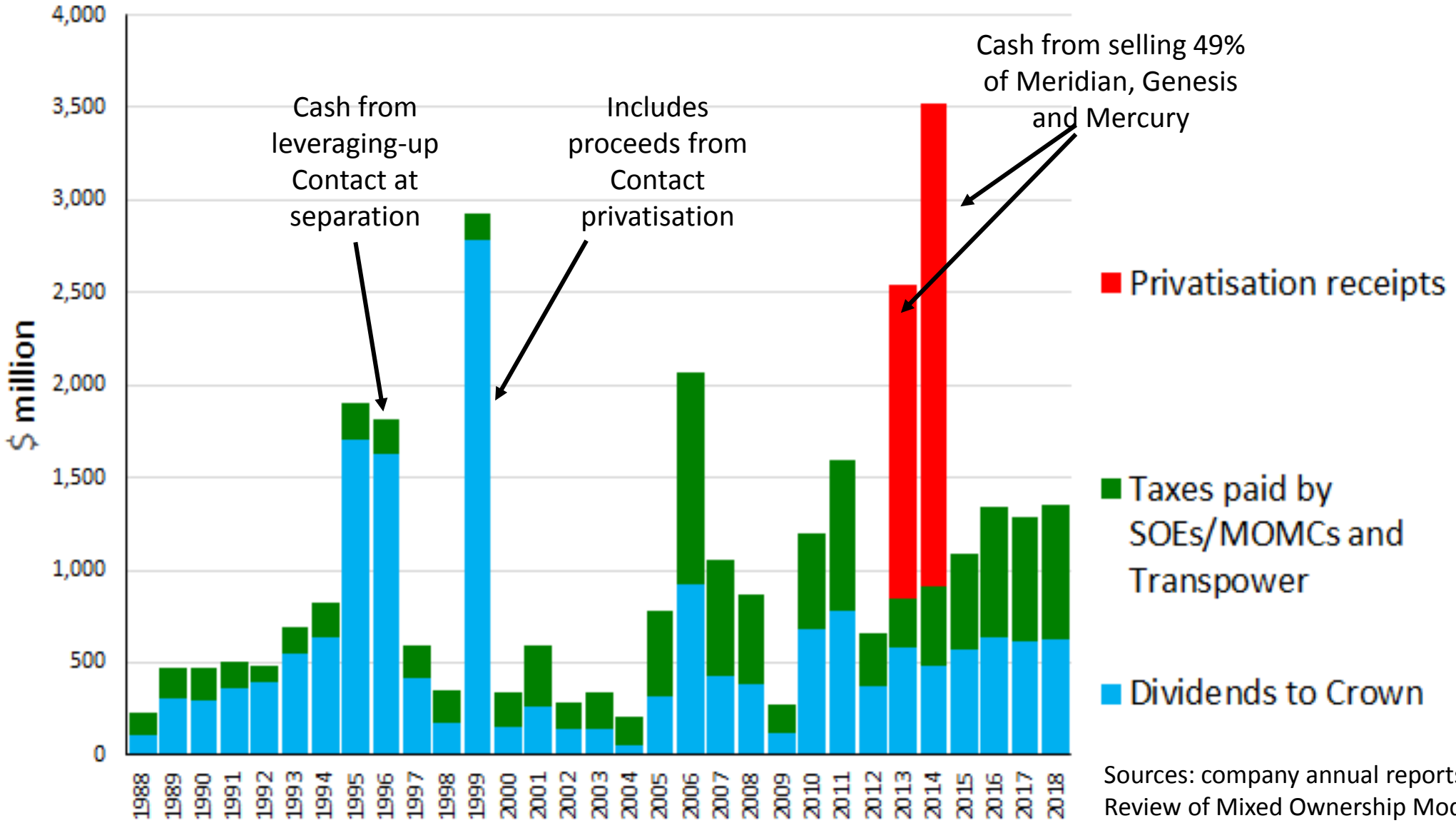
David Richardson, *The Costs of Market Experiments: electricity consumers pay the price for competition, privatisation, corporatisation and marketization*, Canberra: The Australia Institute, January 2019, http://www.tai.org.au/sites/default/files/P470%20Electricty%20Consumers%20Pay%20the%20Price%20%5BWEB%5D.pdf,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

There are two key problems preventing a well-being-focused policy response

1. The industry structure is firmly entrenched by legislation passed by our Parliament over the three decades:
   - Commerce Act 1986
   - SOE Act 1986
   - Energy Companies Act 1992
   - Energy Industry Reform Act 1998
   - Commerce Amendment Act 2008
   - Electricity Act 2010

2. The Government's fiscal surplus depends heavily on a continued flow of profits and taxes from the industry

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

Quick review of 8 problems (not an exhaustive list!)

1. Breaking up an integrated tightly-planned system loses synergies (there is an efficient minimum size for a "firm") => separating "lines" from "energy" killed off local-level integrated supply and hindered national-level planned operation

2. Gentailer "competition" is not what the economics textbooks mean by competition, and vertical integration of generation and retailing has foreclosed all except trivial "fringe" competitive entry into the retail market

3. Financial engineering took out cash (capitalised rents) up front, leaving high ongoing "finance costs". But rent (even when used to service debt obligations) is not an economic cost.

4. 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.

5. Applying “building-block” regulation in 2008 after monopolists had been allowed in 2002 to lock-in their profit-maximising prices and asset values meant putting a floor, not a cap, on lines charges (“regulatory capture”)

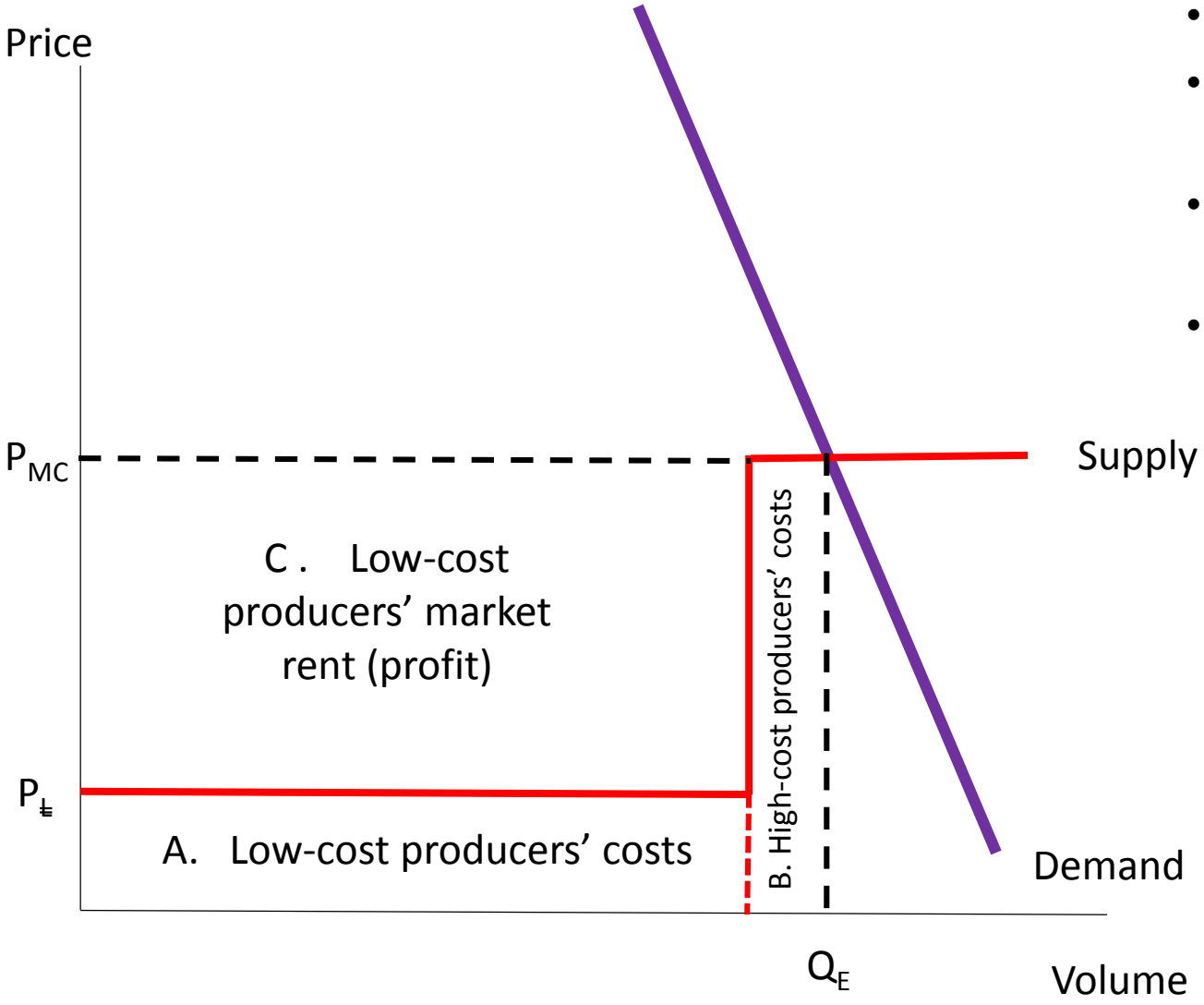
6. Regulating lines company total revenue but not detailed prices leaves allocation across customer classes wide open to exploitation of the most vulnerable captive customers (“Ramsey pricing”)

7. If you price wholesale electricity (generation) in an increasing-cost industry at marginal cost (what Treasury calls “true cost”) in place of average cost, the competitive market drives the wholesale price up, not down

8. The current market design forces consumers to pay more for renewable electricity as the carbon price goes up => windfall profits for hydro and geothermal owners => strong incentives to keep fossil fuels going at the margin

Wholesale market design

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

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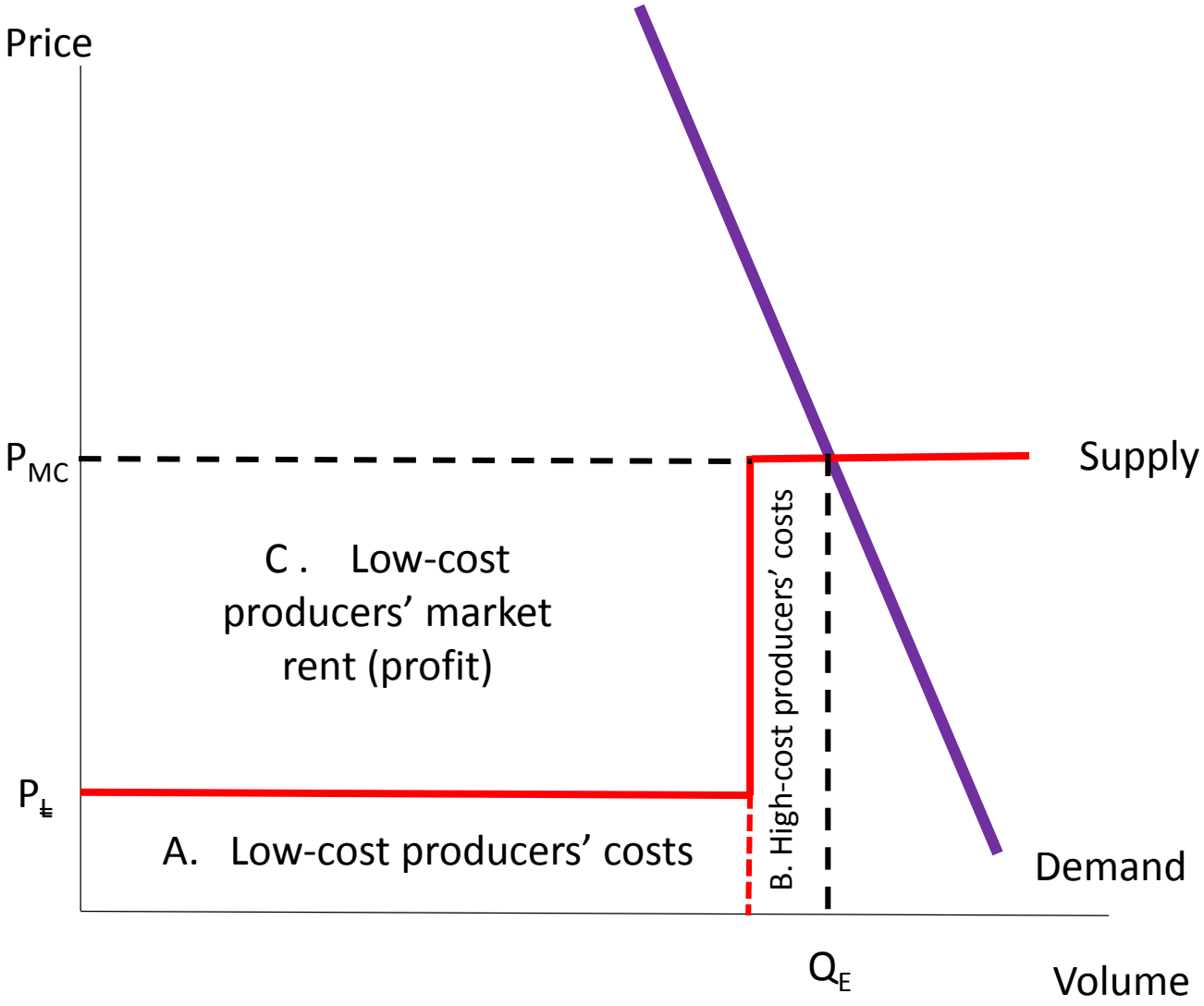

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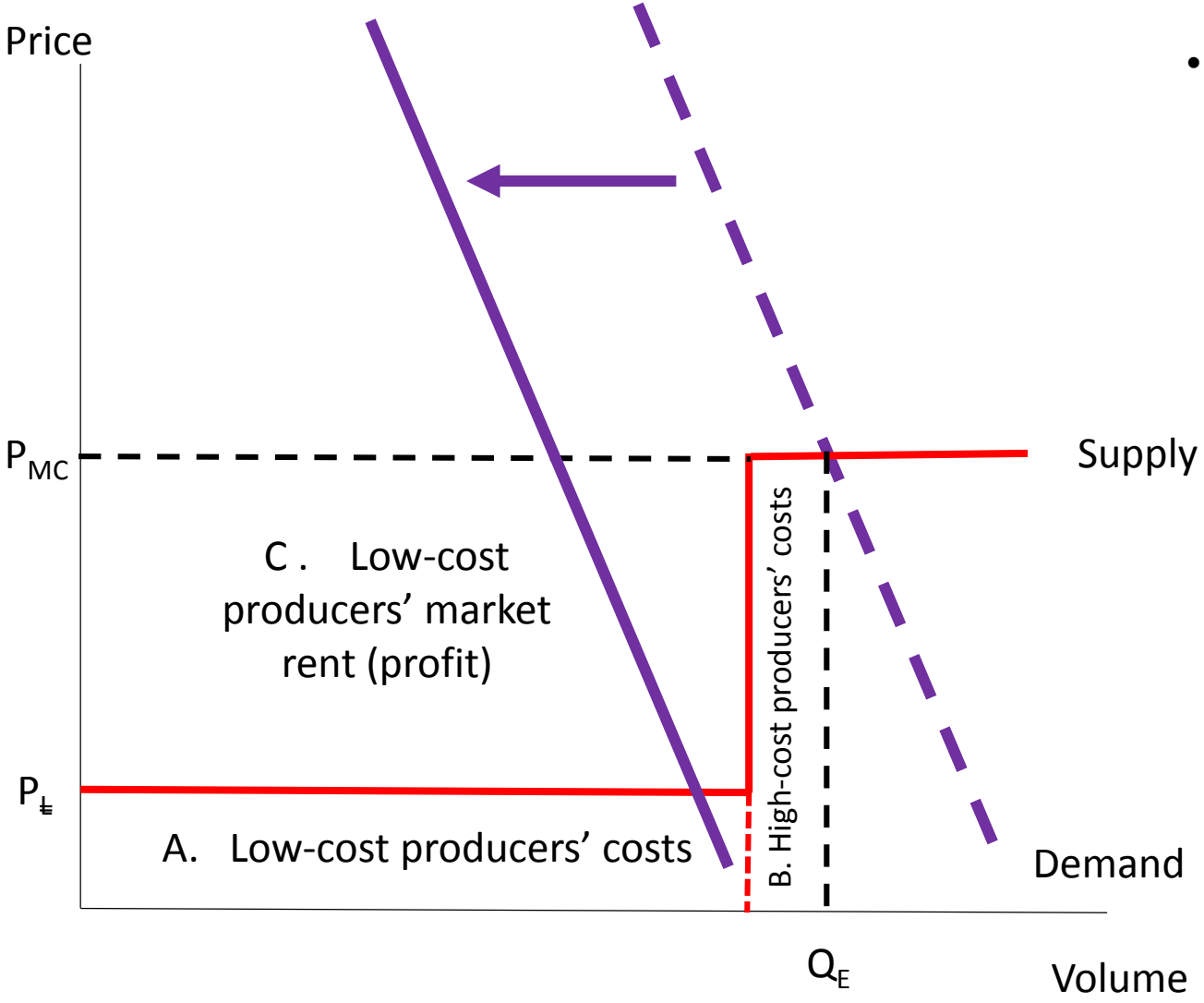

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- Shift the demand curve left (e.g. close the Tiwai Point smelter) and the price drops radically to P_L – and so do profits

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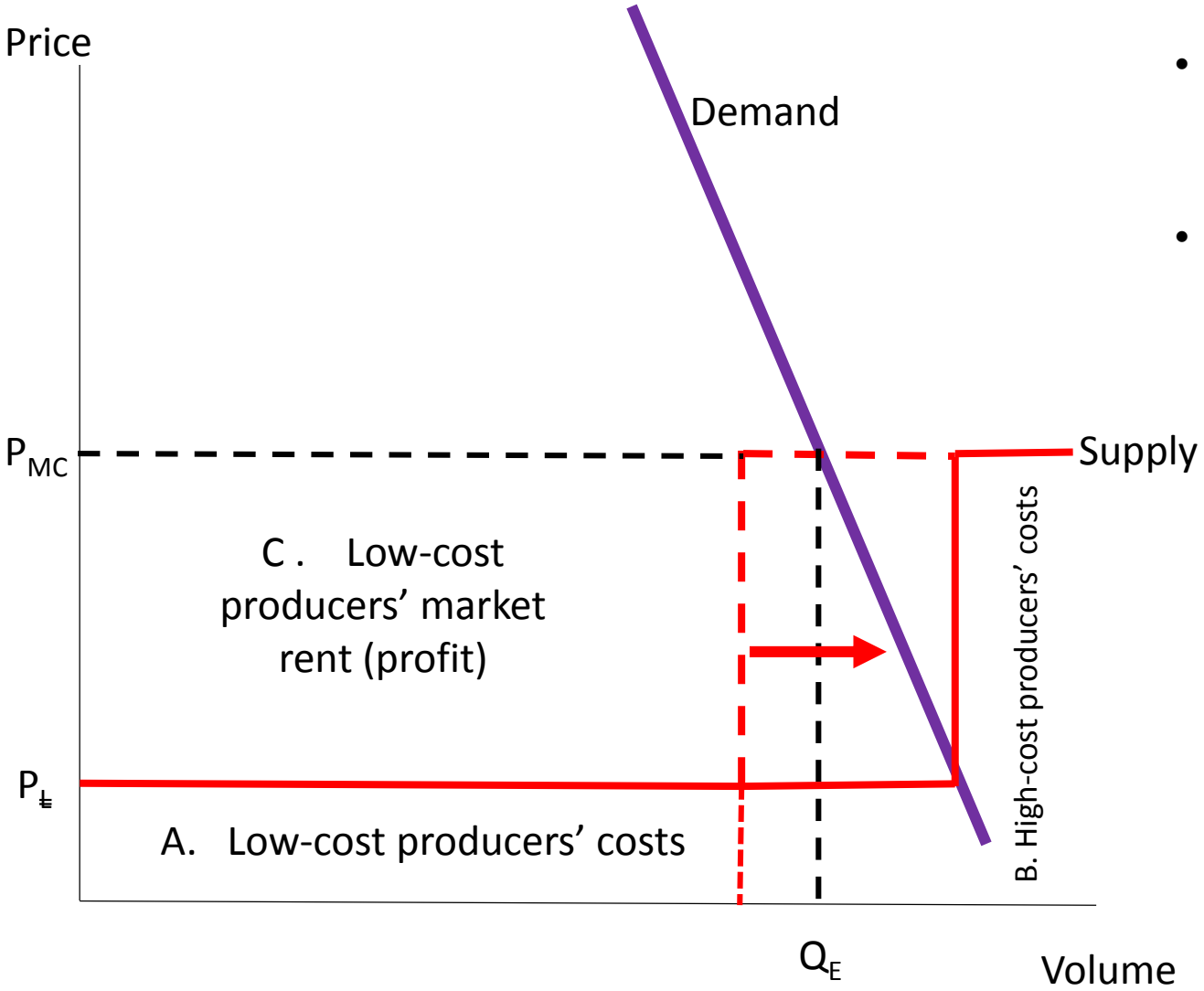

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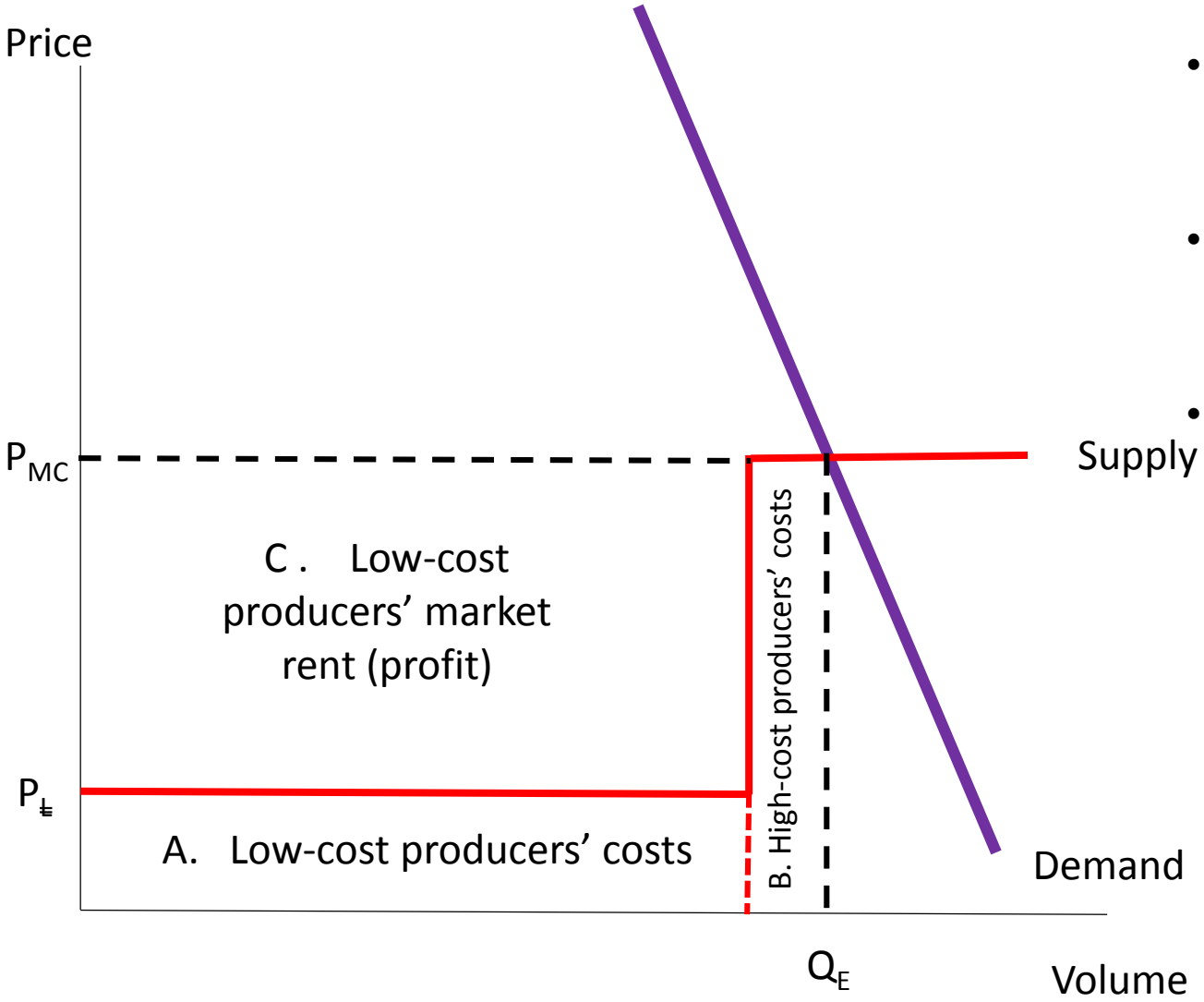

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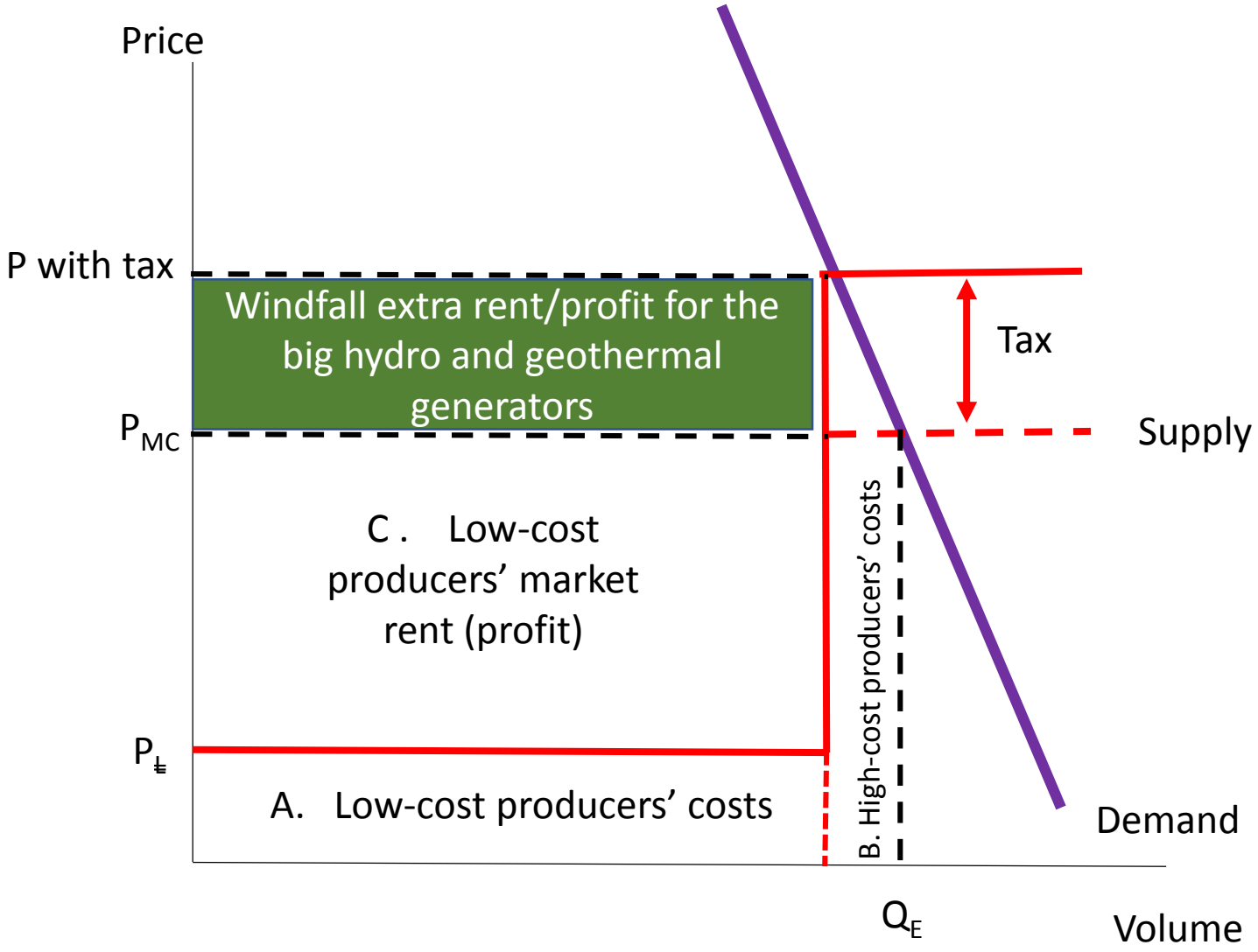
- Add more low-cost supply, pushing the high-cost suppliers out (off the margin) and the price drops radically – and so do profits
- Core strategy for Contact, Meridian, Mercury and Genesis is:

Keep demand up (keep the Tiwai Point smelter open!)

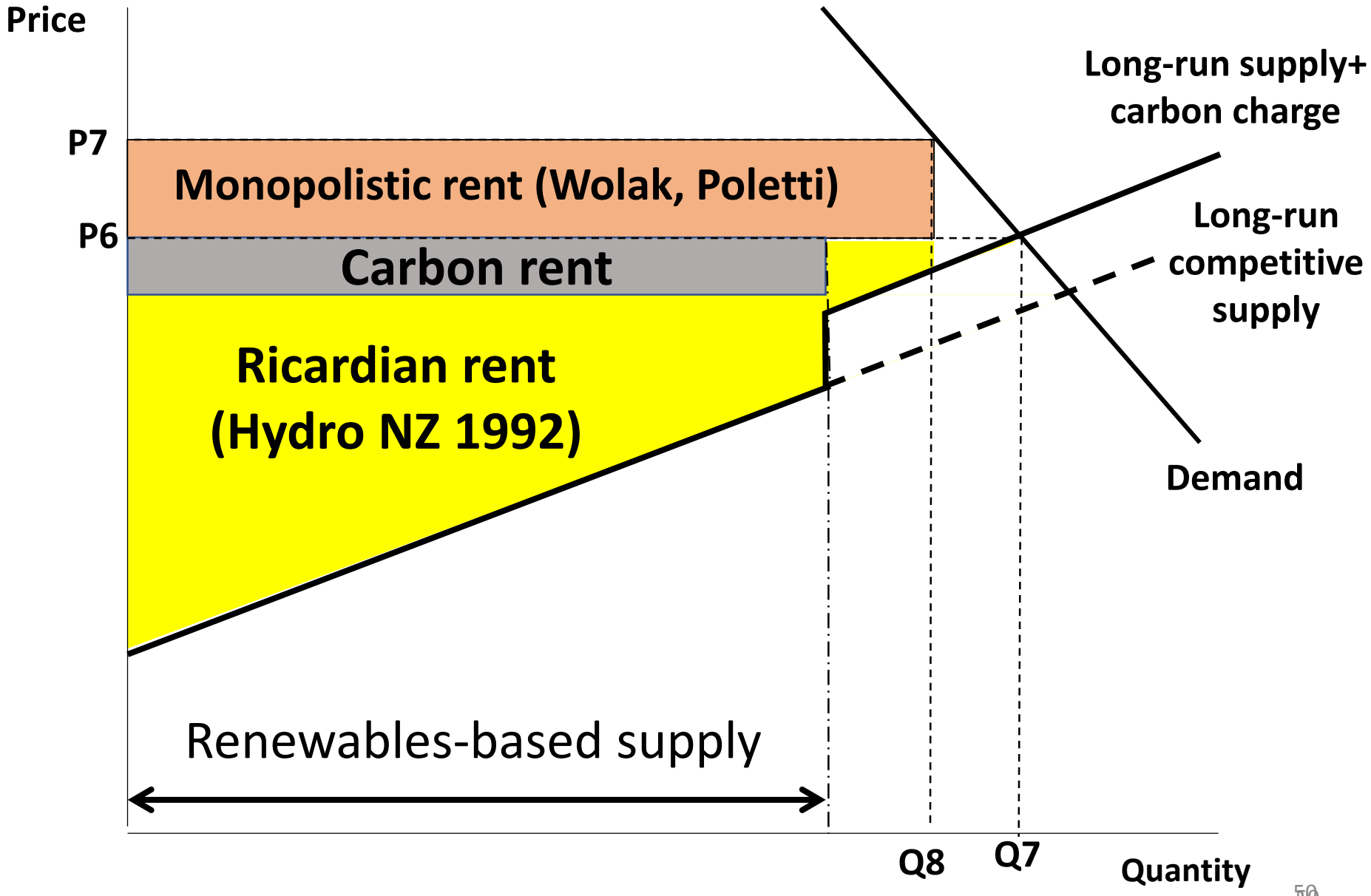
Keep supply constrained (don't build too many windfarms, and block rooftop solar if possible

Now add a carbon tax when the marginal suppliers use fossil fuels:

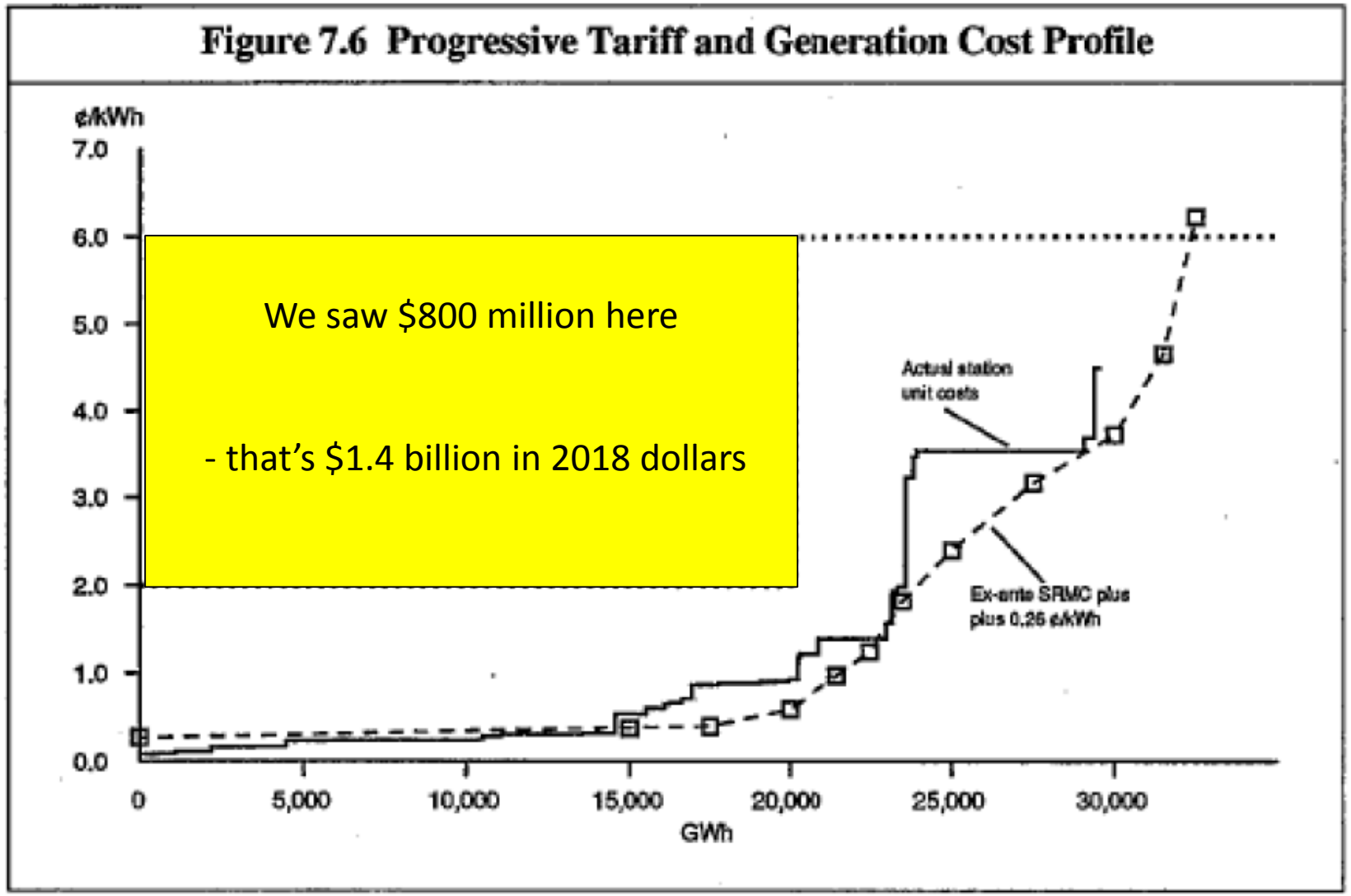


Here's how to make the Emissions Trading Scheme a recipe for re-carbonisation of the economy

With both a carbon charge on non-renewable generation and monopolistic pricing:



Casting our minds back twenty-seven years….



Source: Geoff Bertram, Ian Dempster, Stephen Gale and Simon Terry, *Hydro New Zealand: Providing for Progressive Pricing of Electricity*, 1992, p.51.

Stand back now and think big-picture policy

Before 1984

- An “essential service” collectively provided
- Priced as cheaply as possible to households: wellbeing the goal
- 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 generator plus the monopoly price for each lines-network operator plus a fat margin for dominant retailers
- 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

So what could be done now?

- Depends on your view of Government
  - Marx: “committee of the bourgeoisie”
  - Buchanan/Friedman/Hayek: predatory, deadweight burden, captured by rent-seekers
    - See also James K. Galbraith *The Predator State* – a left-wing view that real-world neoliberal governments are predators
  - 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
  - Incentives matter, even for the Minister of Finance (around $2 billion of annual revenues depends on high profits in electricity)

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 and given a central role in driving the economy to zero carbon
- 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”
- Establish a mechanism to install reserve generating capacity on the market margin without requiring all prices to rise to long-run marginal cost. E.g. contract for reserve capacity as such, or build (or buy up) reserve capacity owned by the state to backstop predominantly low-priced renewable supply
- Instantly get rid of the perverse flow-through from carbon price to renewable price and rents
- At retail level, rebalance prices so that household prices come back down from their current heights, as
    1. rents and excess profits are stripped out of the supply chain;
    2. industrial and commercial users pick up a bigger share of whatever supply-cost burden remains

    $\Rightarrow$ Either regulate household prices down, 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 alongside independents, all with access to bulk contracted supplies of cheap hydro
- Make net metering mandatory to allow small independent suppliers of distributed renewable electricity such as rooftop solar a share of the market and a role as disruptor of incumbents’ market power
- But can you un-scramble an egg?

In the real world as we know it (still very optimistic)

- Assume some serious willingness to intervene politically [otherwise move to the default on the next slide]
- 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
- Augment or abolish the limits on local lines operators' investment in generation
- Amend the ETS to allow renewables to bring down the electricity price
- Massively overhaul the Commerce Commission's approach to lines company regulation by switching it from a floor price to a ceiling price, and with a ruthlessly sinking ceiling
- Amend Part 4 of the Commerce Act to prescribe elimination, not just token "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
- Open the way for local electricity pooling (e.g. rooftop solar with battery backup on a community scale) with a workable boundary interface with grid supply including net metering

In the real world as we know it (less optimistic)

- Assume Government stays largely paralysed by the vested interests but might do some small-scale fiddling.
- Possibilities:

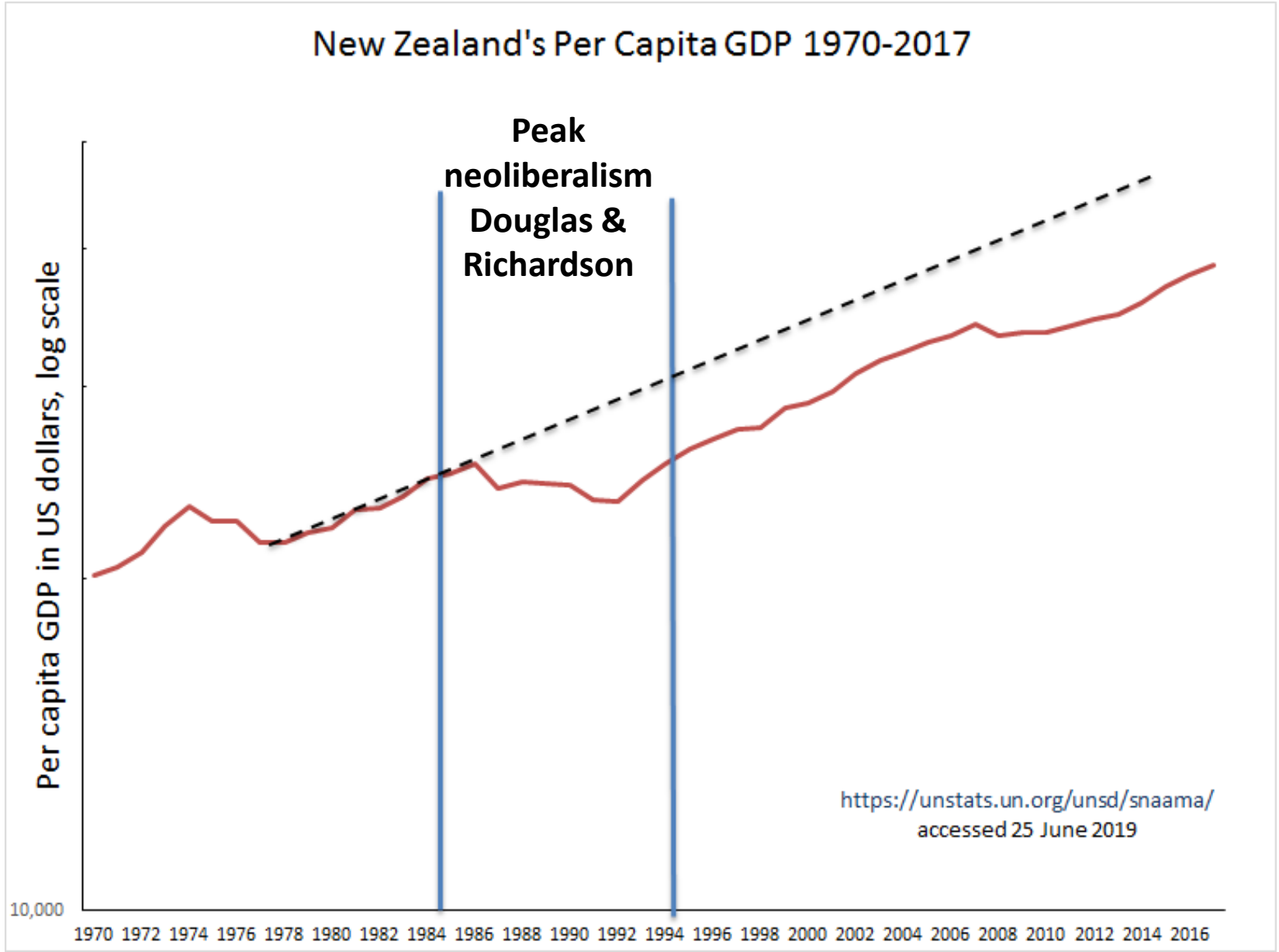
  - Insist on a level playing field for entry to the market by distributed generation (rooftop solar, larger solar arrays, independent wind and micro-hydro, local community pools with battery storage) with net metering arrangements
  - Ensure that disclosed information is analysed and prominently displayed 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
  - Fix the possibly-unintended consequences of the ETS under the current market setup
  - 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
  - Maybe abolish Commerce Commission regulation of distribution networks – let them face consumers in the open

In the real world as it is

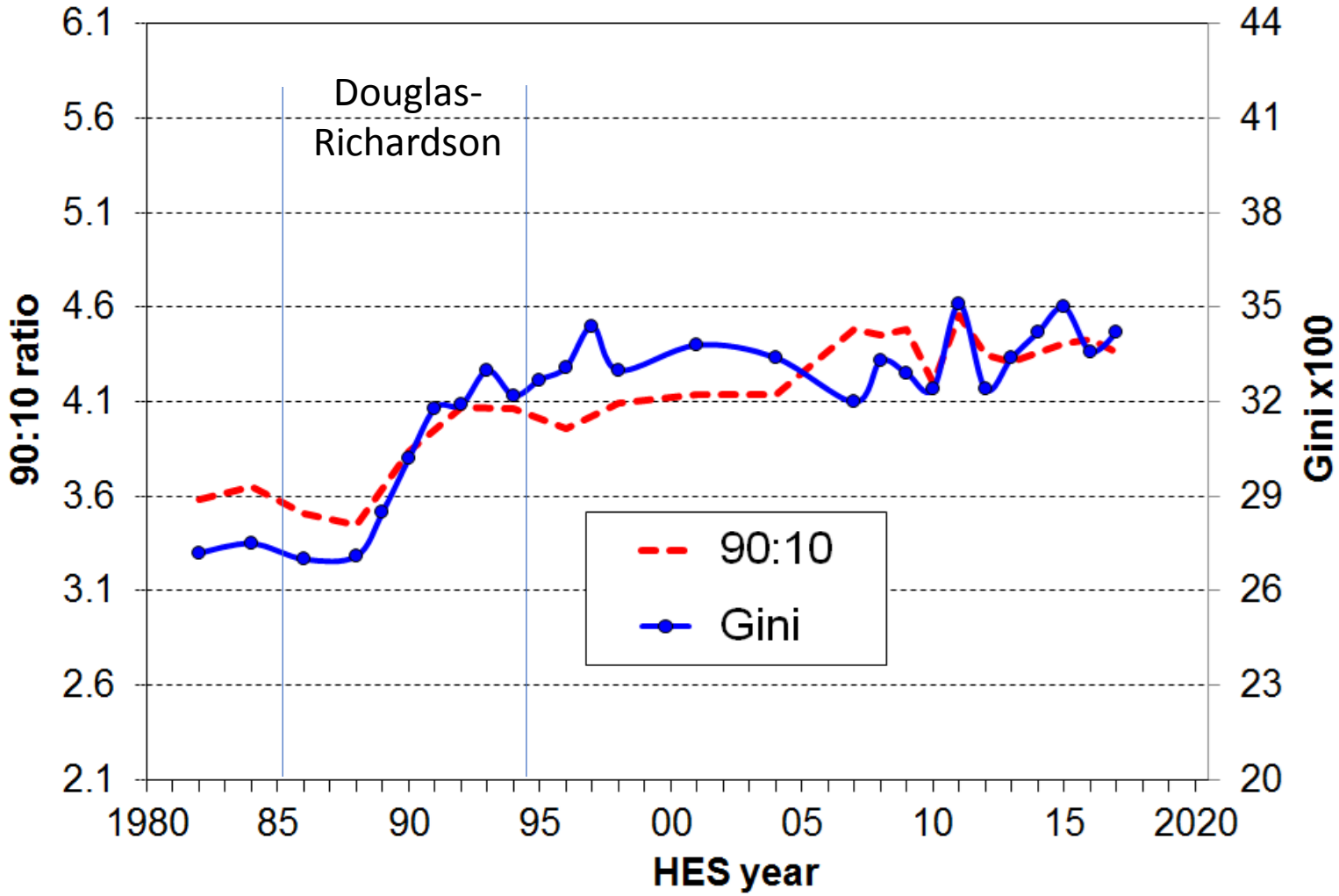
- Give money (Winter Energy Supplement) to household consumers to help them pay their bills (in the process shifting the market demand curve right, adding cash to the industry's rentiers)
- Take away the low fixed charge regulations to shift the cost burden from one group of residentials to another (while making rooftop solar less economically attractive)
- Help consumers to shop around (in the process effectively shifting the blame onto them for the increased prices that they have faced)
- Business-as-usual for the gentailer cartel and the distribution monopolies

Just a final reminder: electricity is not an exceptional problem.

Lest we forget, the period 1984-94 has left a permanent mark on New Zealand's economy and society:


New Zealand's Per Capita GDP 1970-2017
Peak neoliberalism Douglas & Richardson
Per capita GDP in US dollars, log scale
10,000
1970 1972 1974 1976 1978 1980 1982 1984 1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016
https://unstats.un.org/unsd/snaama/
accessed 25 June 2019

New Zealand inequality indicators



Brian Perry, *Household incomes in New Zealand: Trends in indicators of inequality and hardship, 1982 to 2017,* Wellington: MSD, October 2018, p.90.