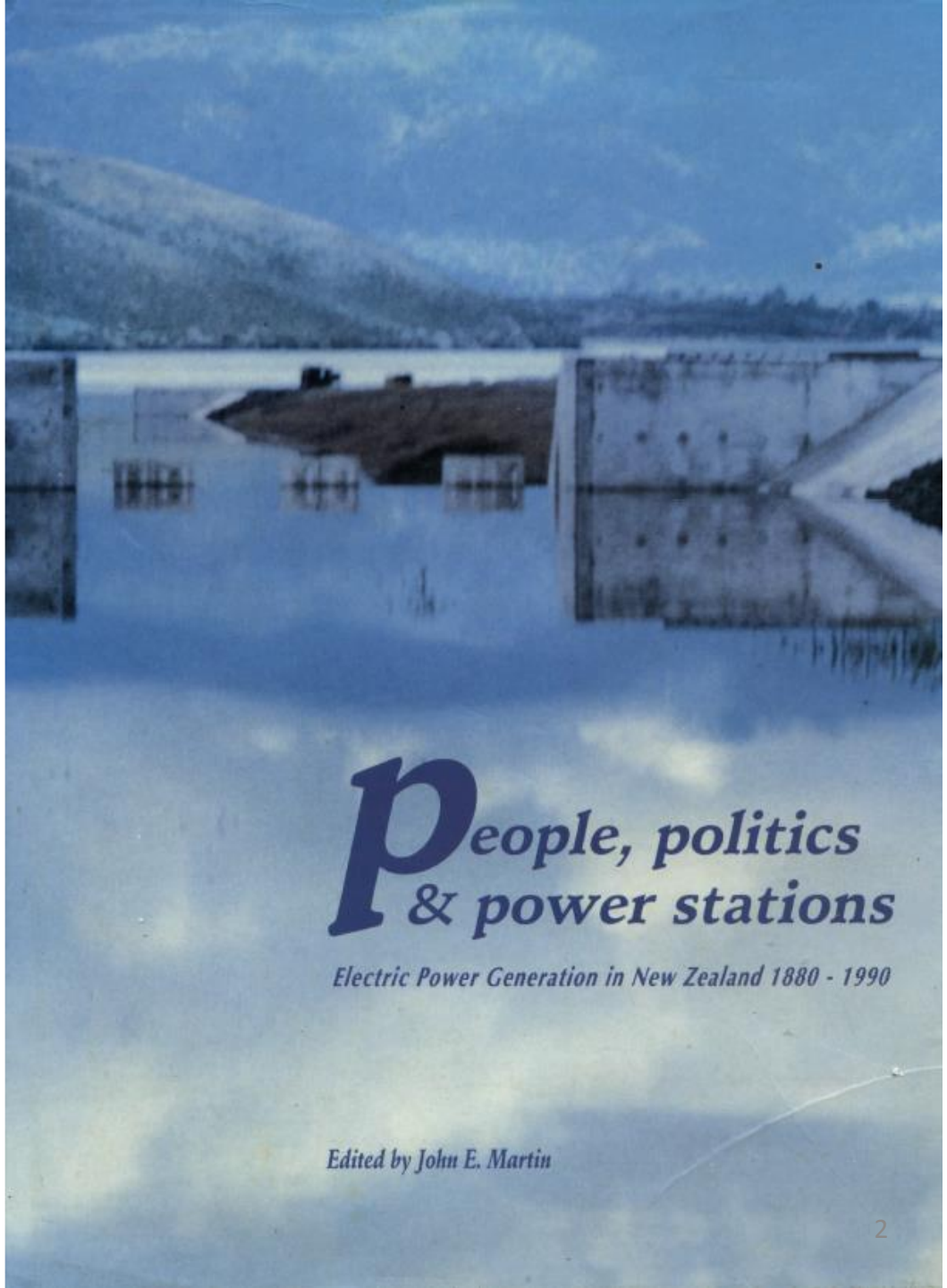
Electricity prices and profits

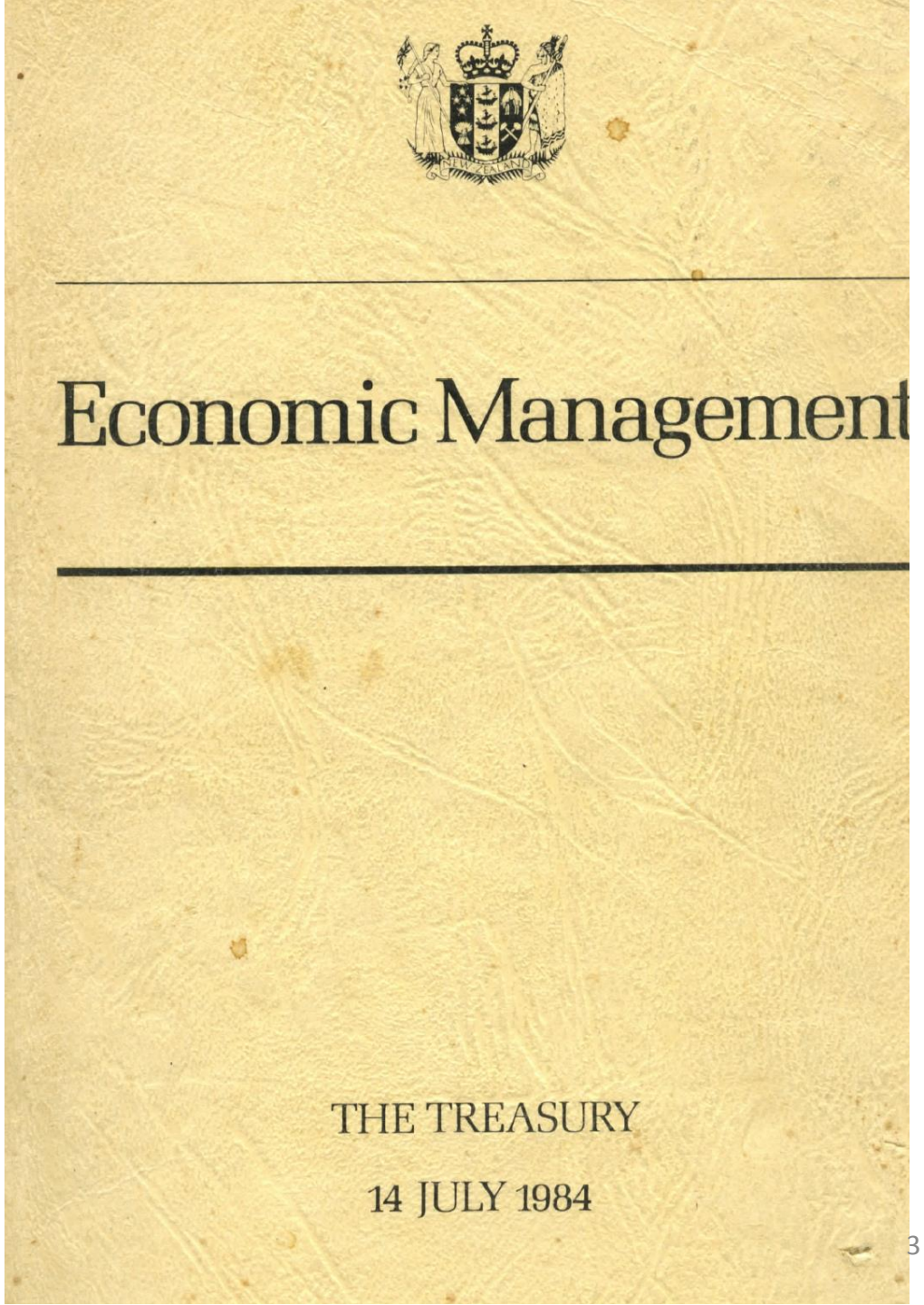
Geoff Bertram

June 26 2019

Electricity history up to the mid-1980s made for a great book about a decades-long collective national enterprise:



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



Two sides to the neoliberal coin

- Market fundamentalism: markets are best, competition the sufficient condition for promoting consumer benefit, regulation a drag on efficiency (Stigler, Posner, Bork, Easterly…) => corporatise, privatise, deregulate: **promise lower prices in long run**

- Small-government agenda driven by desire to reduce taxes on the wealthy and reverse the mid-twentieth century egalitarian consensus (Buchanan) => cut back government provision of “essential services”, move to user-pays, reduce welfare benefits, privatise state assets, substitute non-tax revenues and regressive taxes for progressive taxes: **implies higher prices in long run**

It’s always worth evaluating big policy moves once enough time has passed

Outline

1. Quick history
2. The macro numbers
3. Necessary versus sufficient conditions for consumer benefit
4. The detail: just a couple of sketches
5. Thinking about policy options now

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

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 expropriated, corporatised, and stripped of their retail franchise monopolies

1996 Wholesale “energy-only” 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

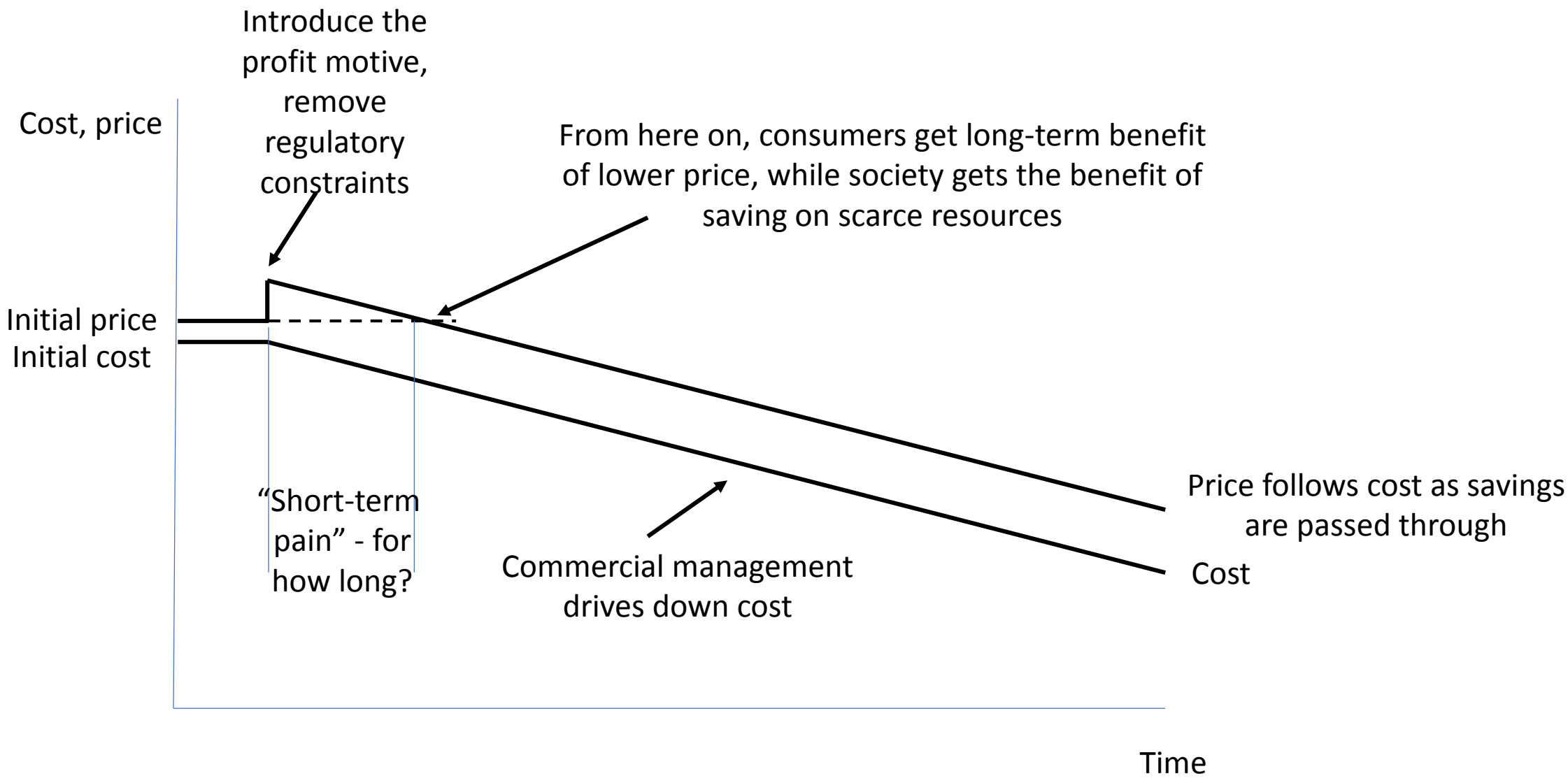
2013-14 Part-privatisation of the SOE gentailers

Central claim of Chicago-school reformers: a more-market set-up with minimal (or no) regulation would raise productivity and bring prices down, promoting "long-term benefit for consumers"

"Bork and the Chicagoans … expected that relaxing antitrust rules would enable firms to achieve greater efficiencies. Firms would lower costs, possibly passing some of the savings through to lower prices. They would also improve their products and services, and innovate more quickly and extensively, boosting economic growth. .. [T]he Chicagoans were making a wager. The bet was that these efficiencies would more than compensate for any increased risk of firms exercising market power. If it worked, consumers would obtain long-term welfare benefits over and above any losses associated with anticompetitive practices.

Jonathan B. Baker, *The Antitrust Paradigm: restoring a competitive economy*, Harvard University Press, 2019, p.2

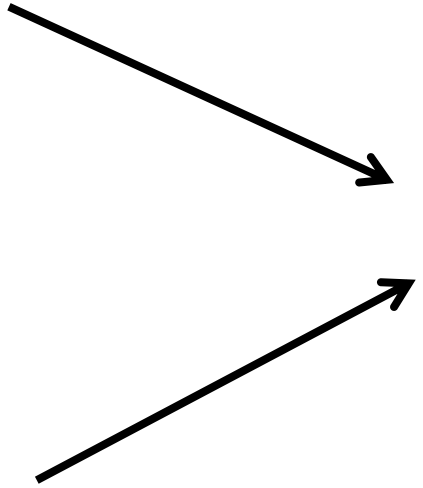
The basic idea:



(At least) two necessary conditions had to be satisfied for the privatisation + deregulation package to work in this way

1. The existing productive arrangements must leave scope to reduce costs without sacrificing quality of supply or other valued co-benefits

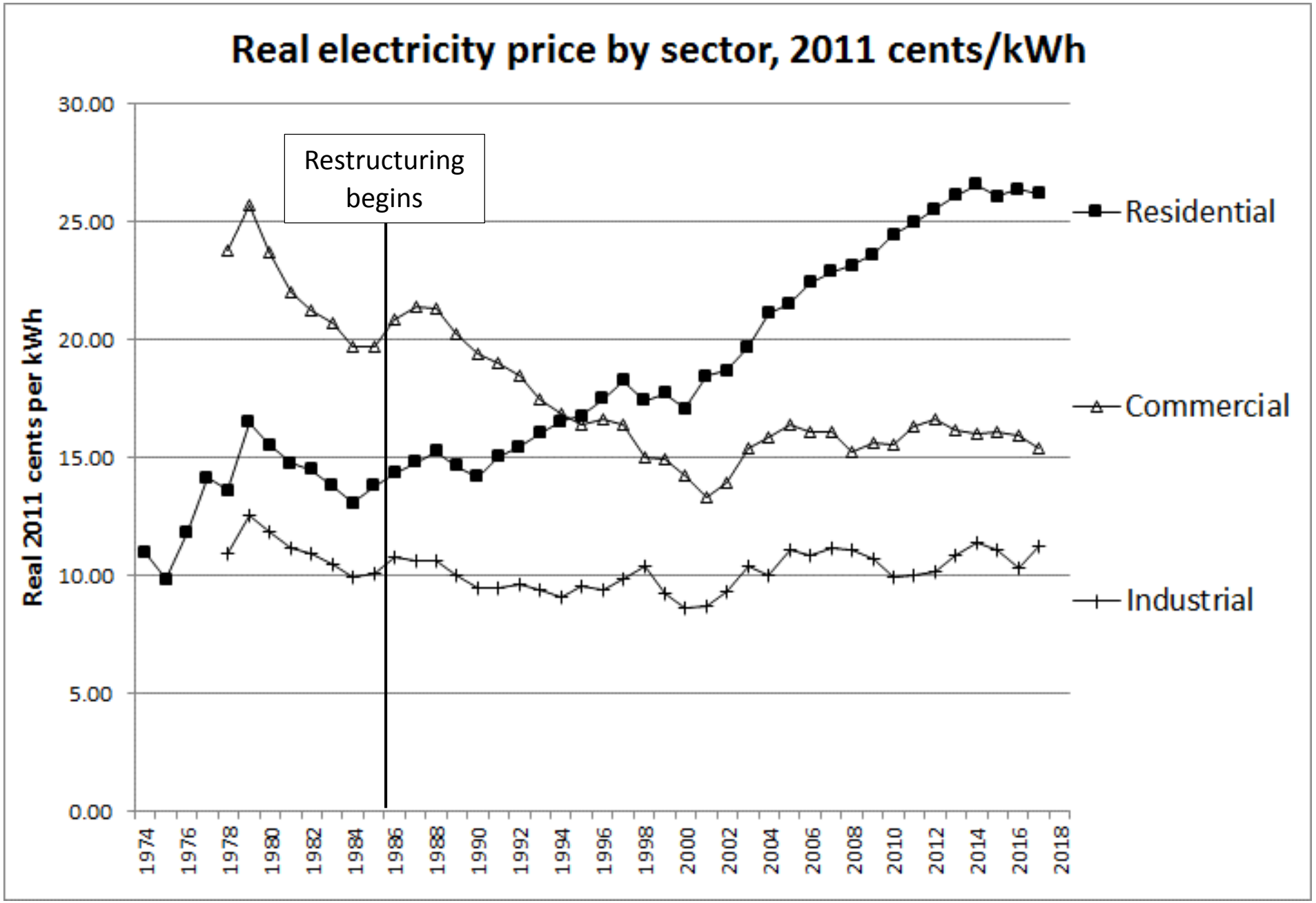
2. In the absence of regulation, competitive forces in the market must be strong enough to force the passing-through of cost savings to prices



Lower prices for same or better service
= long term benefit for consumers

So how did the great experiment work out?

First, prices…….

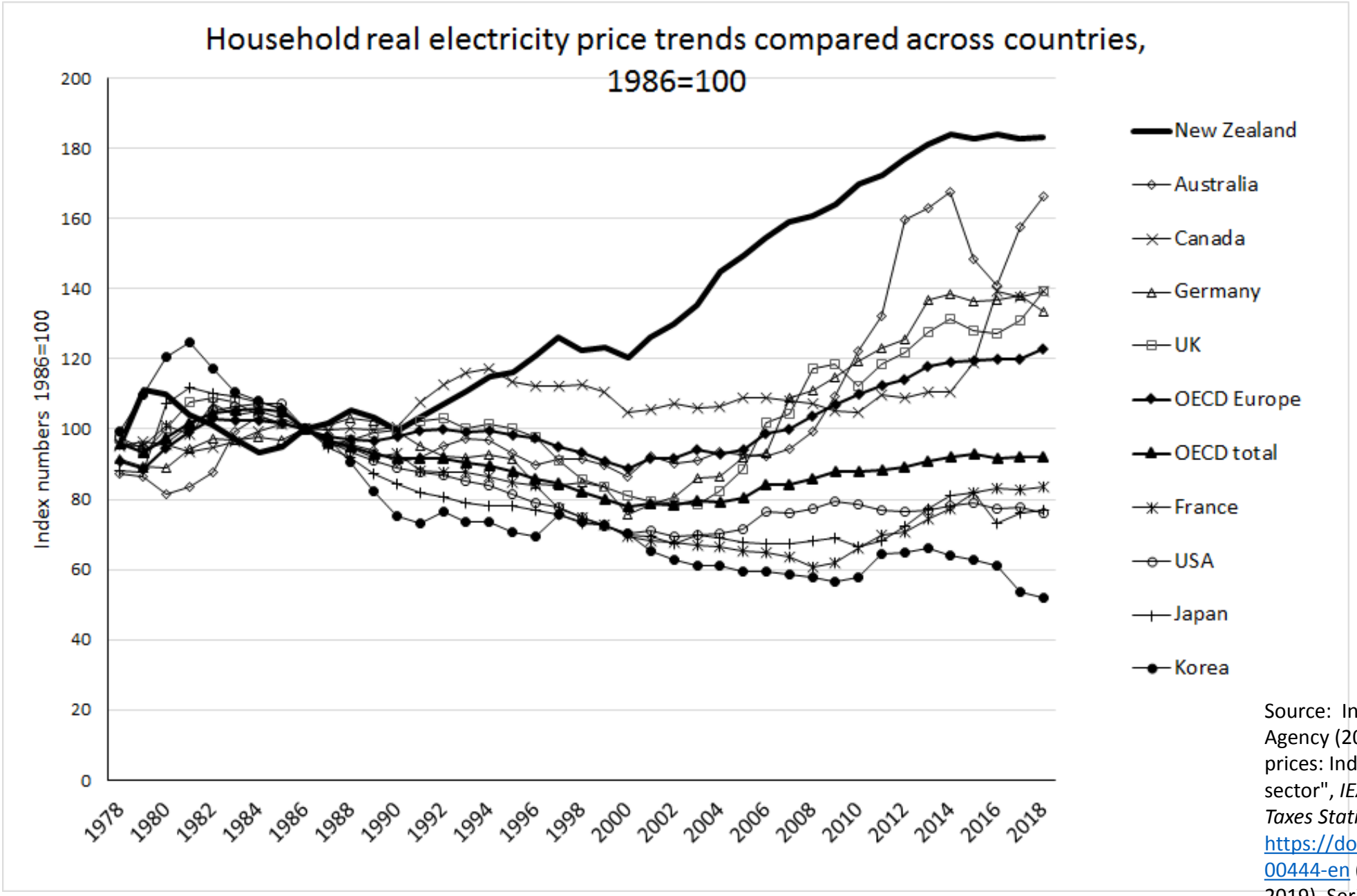


Long term losses for households

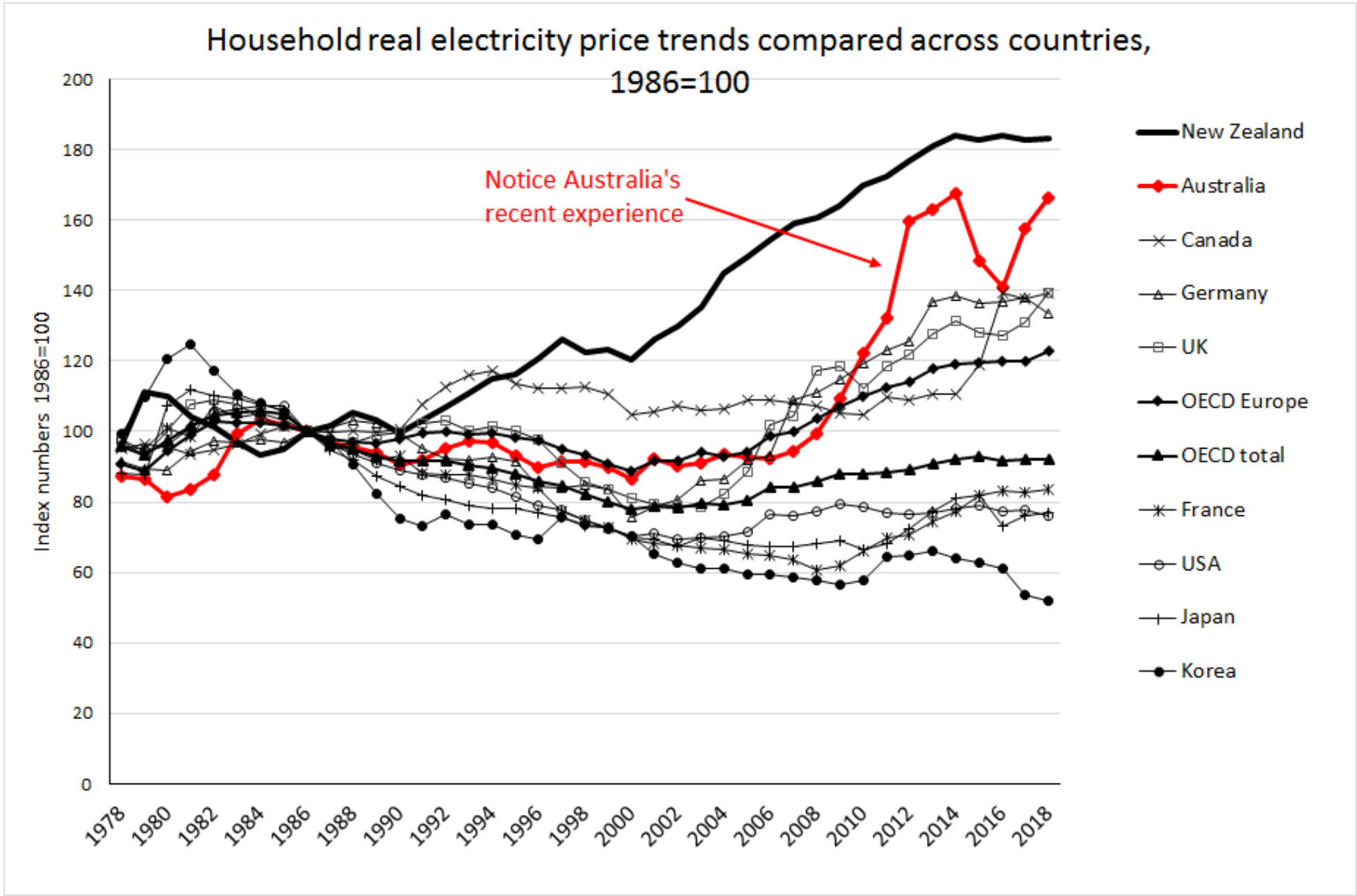
"Long-term benefit" for commercial (and some industrial) users

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.

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
20
0
1978
1980
1982
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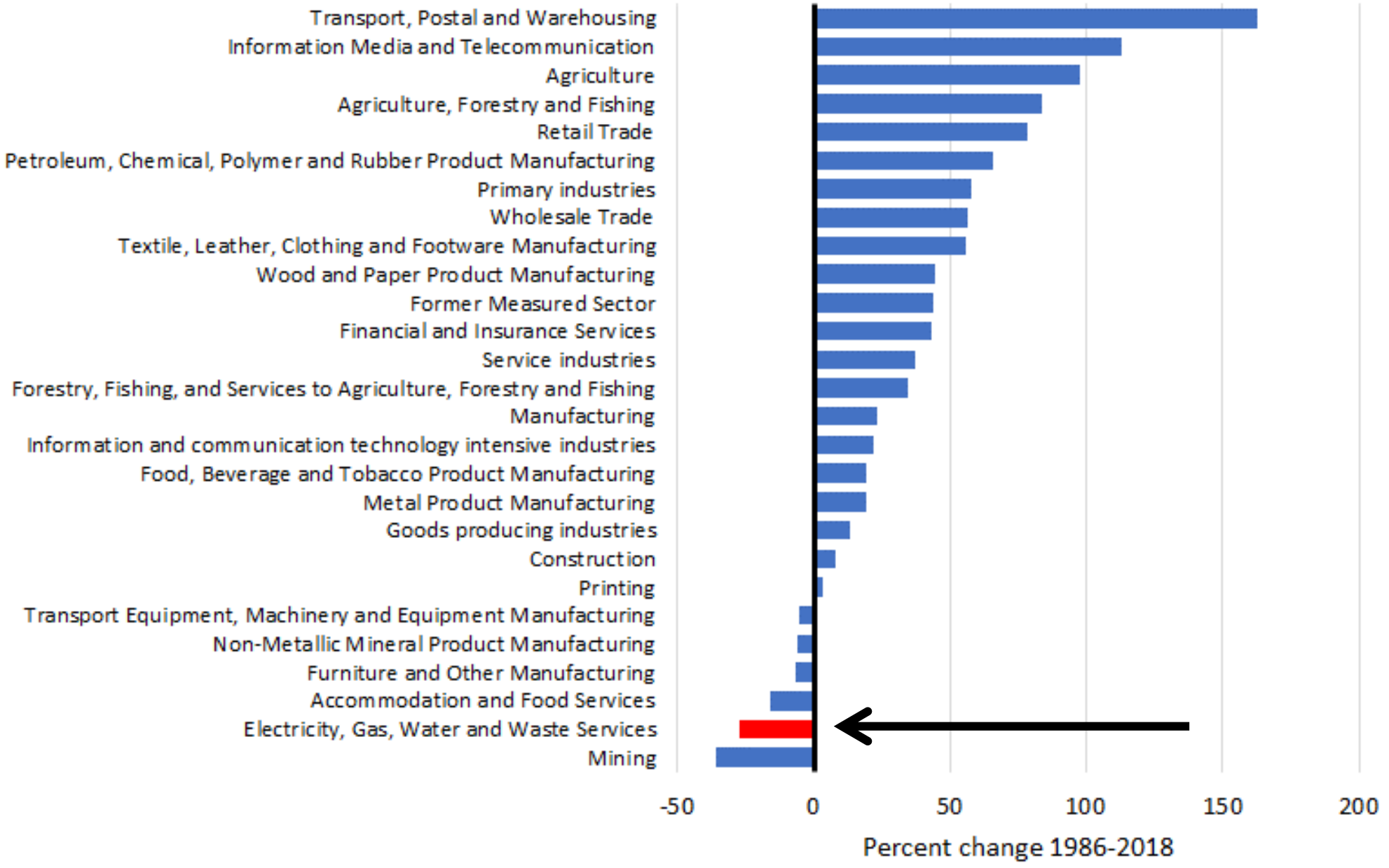
2004
2006
2008
2010
2012
2014
2016
2018

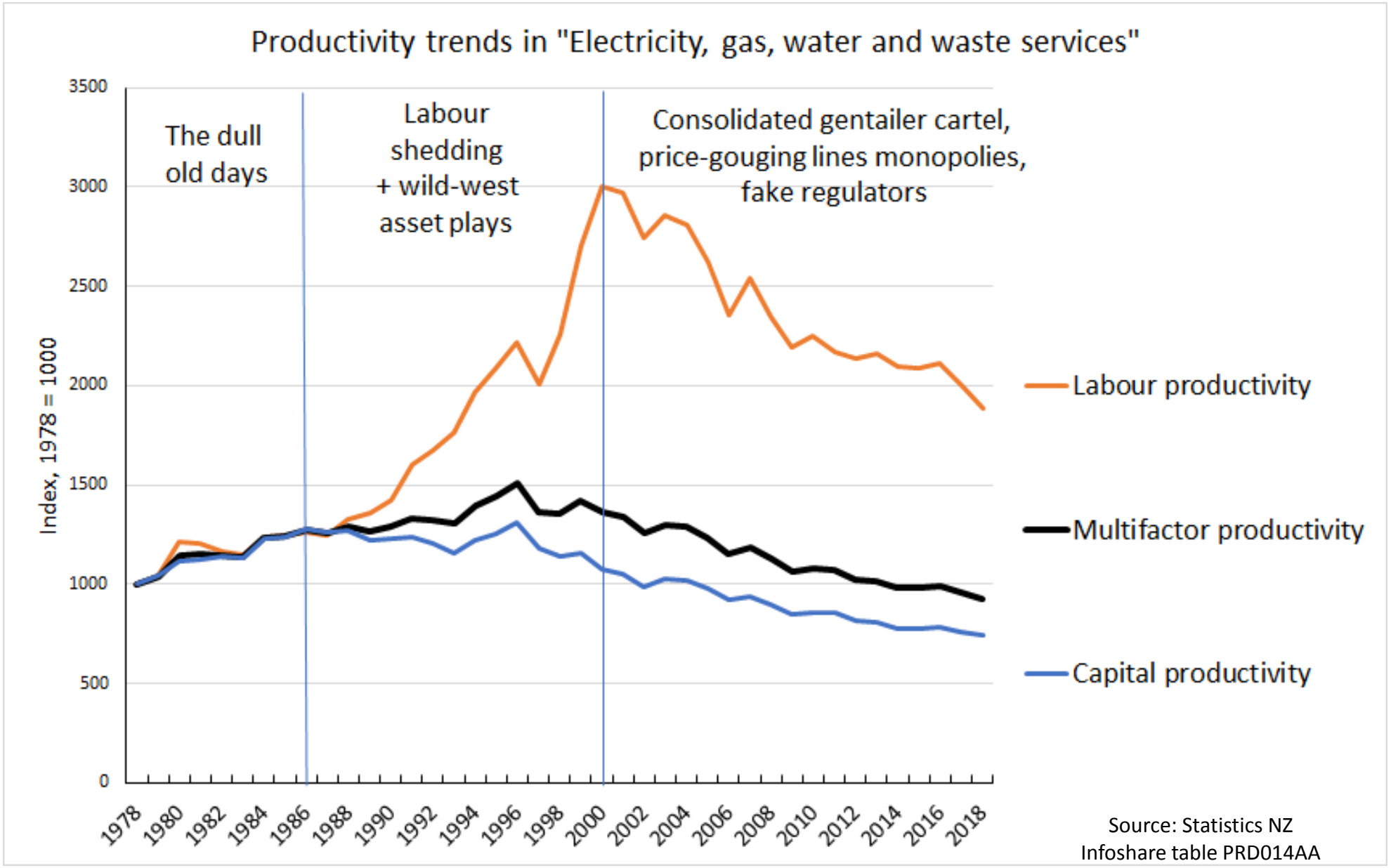
How about productivity?

Electricity is the dominant component of “electricity gas, water and waste services” in the national accounts

Percent change in multifactor productivity 1986-2018

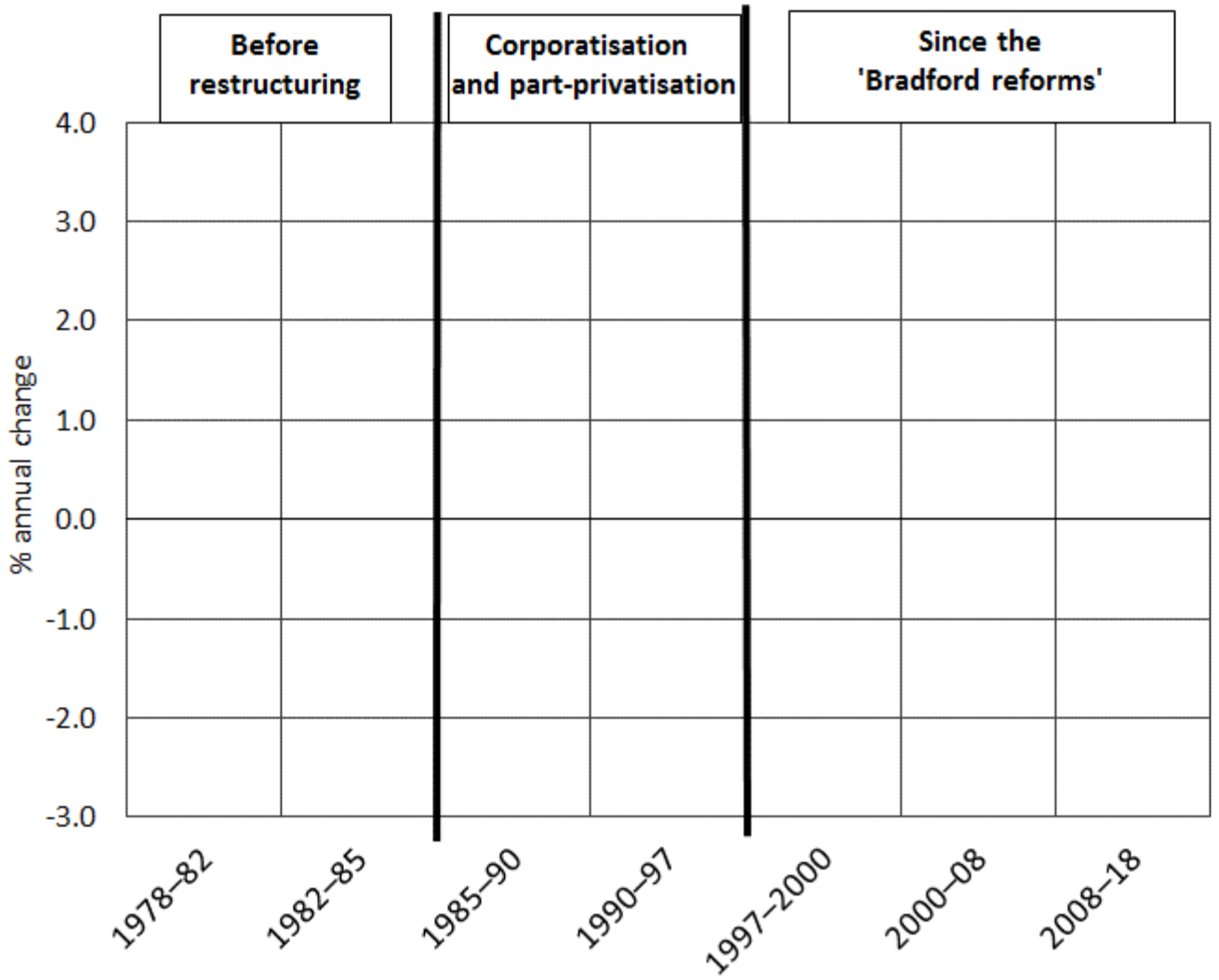


Source: Statistics New Zealand
Infoshare table PRD014AA
updated February 2019



Source: Statistics NZ
Infoshare table PRD014AA

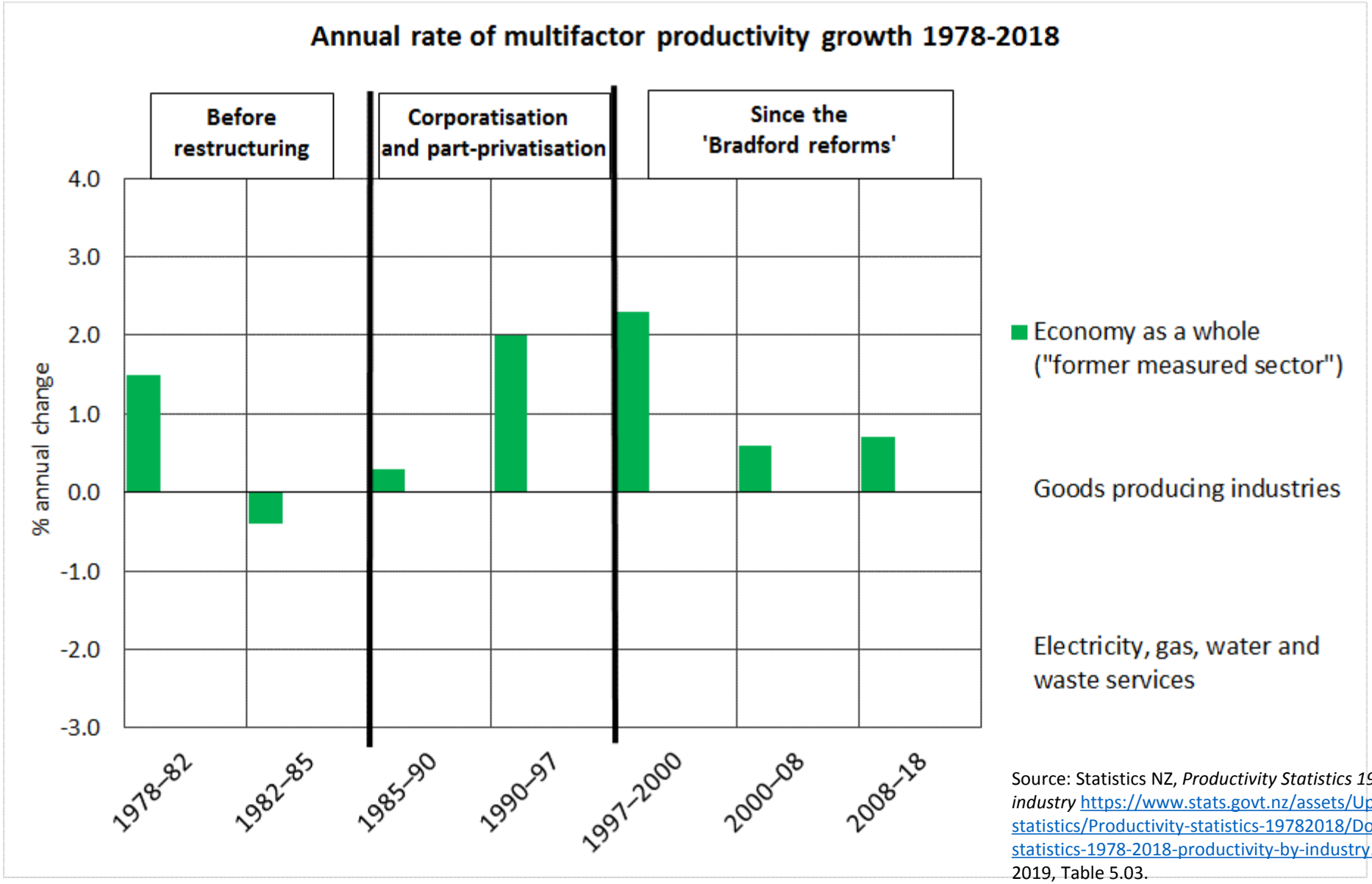
Annual rate of multifactor productivity growth 1978-2018



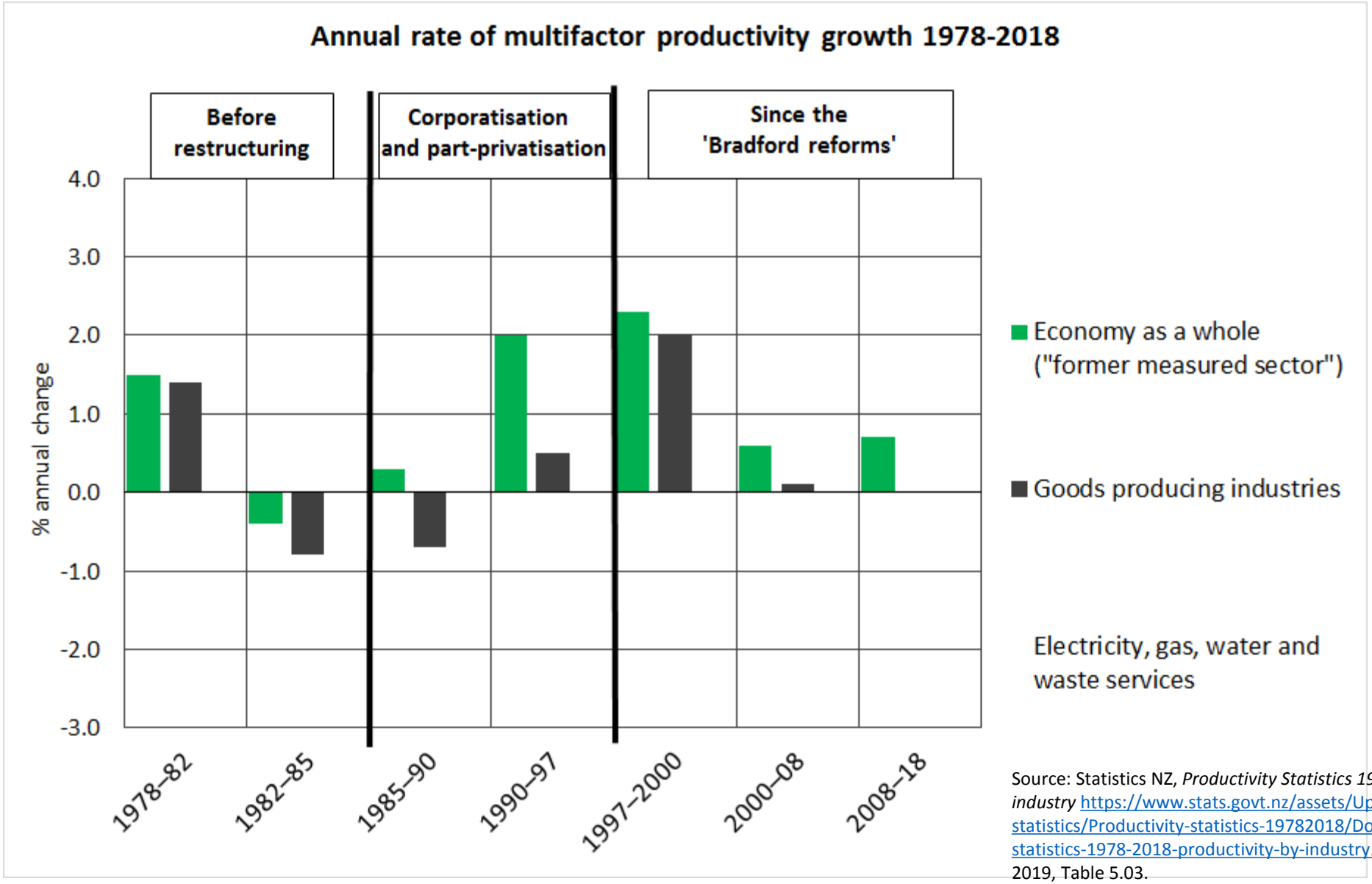
Economy as a whole ("former measured sector")

Goods producing industries

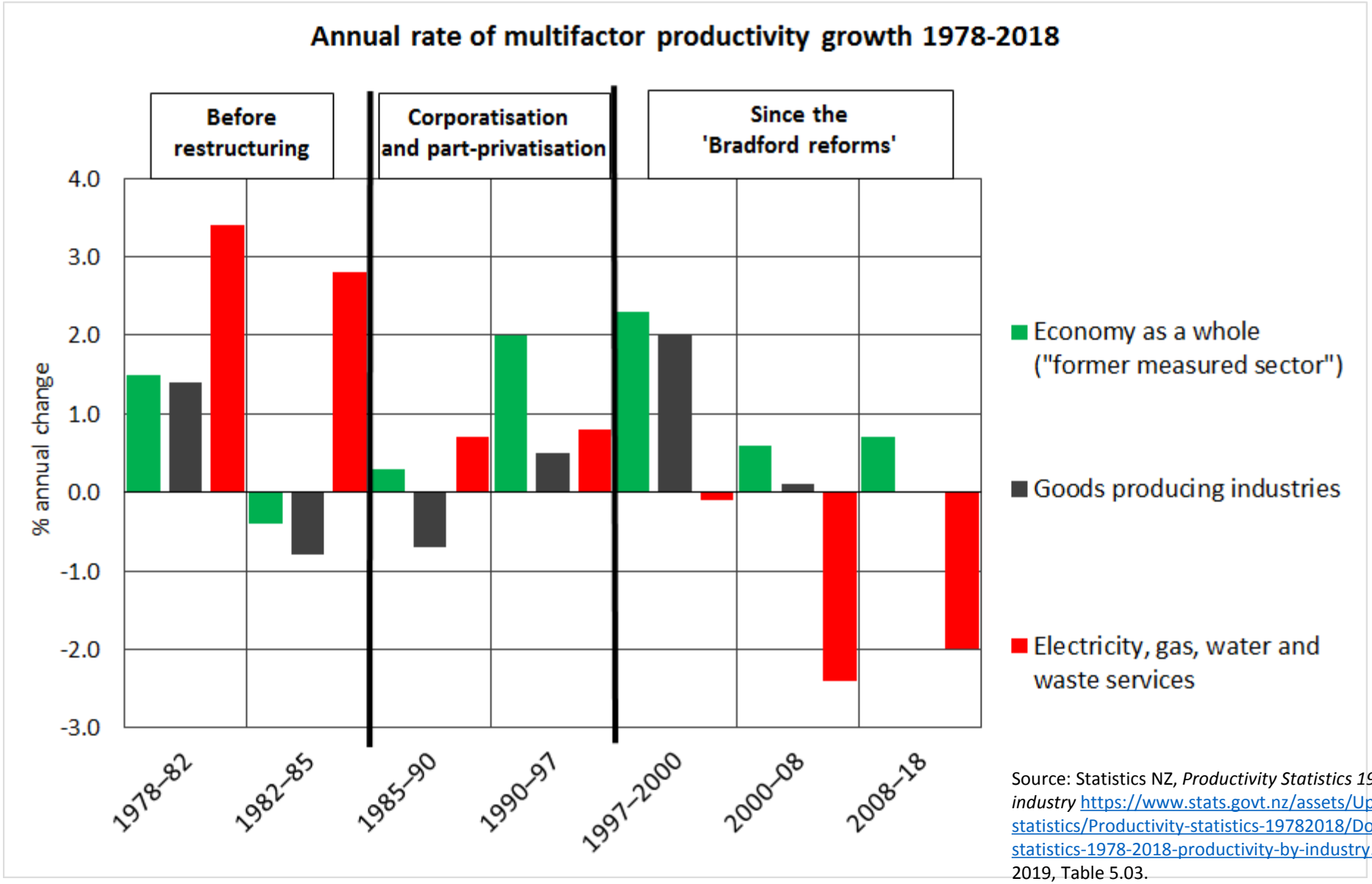
Electricity, gas, water and waste services



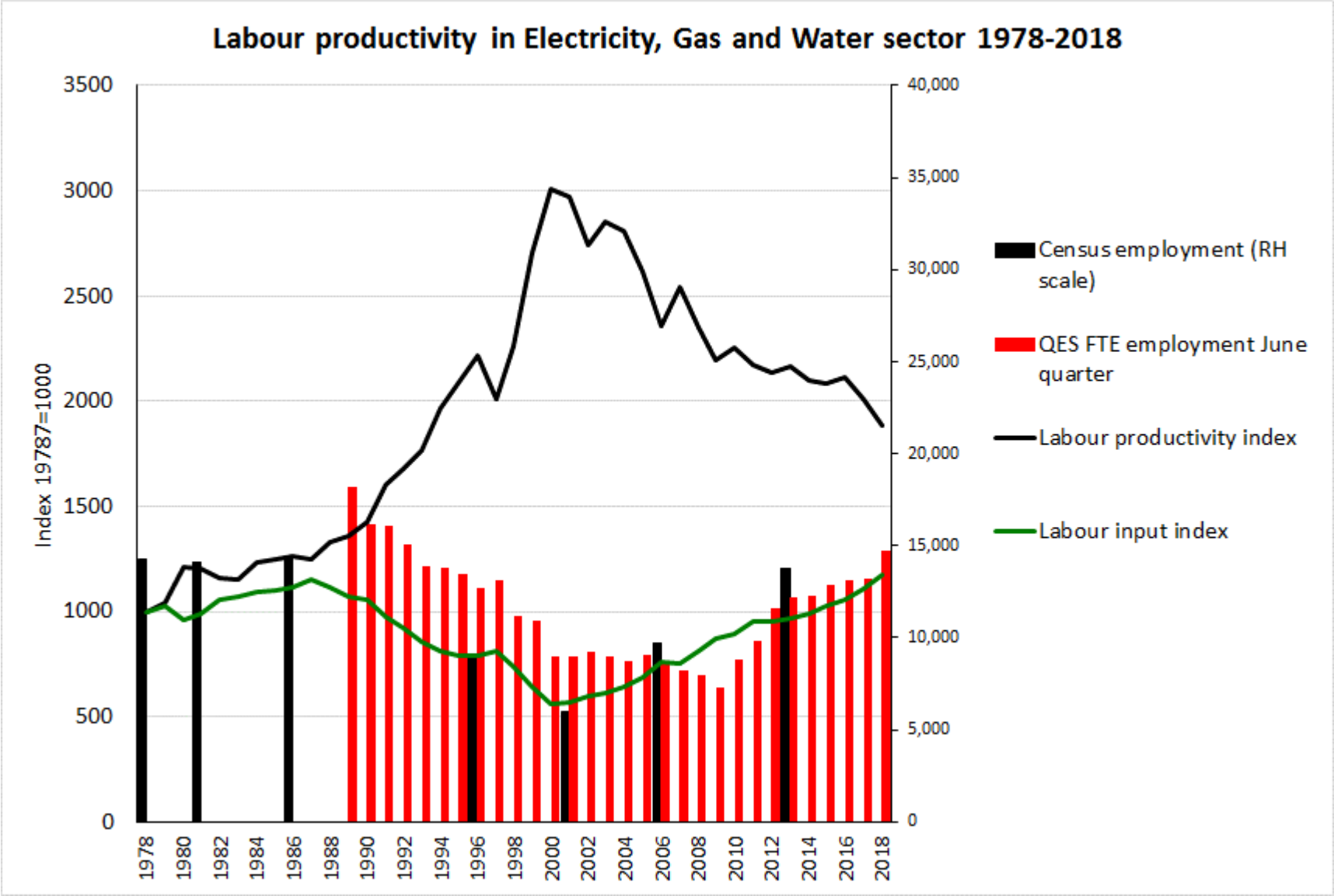
Source: Statistics NZ, *Productivity Statistics 1978-2018 – productivity by industry* https://www.stats.govt.nz/assets/Uploads/Productivity-statistics/Productivity-statistics-19782018/Download-data/productivity-statistics-1978-2018-productivity-by-industry.xlsx accessed 20 May 2019, Table 5.03.



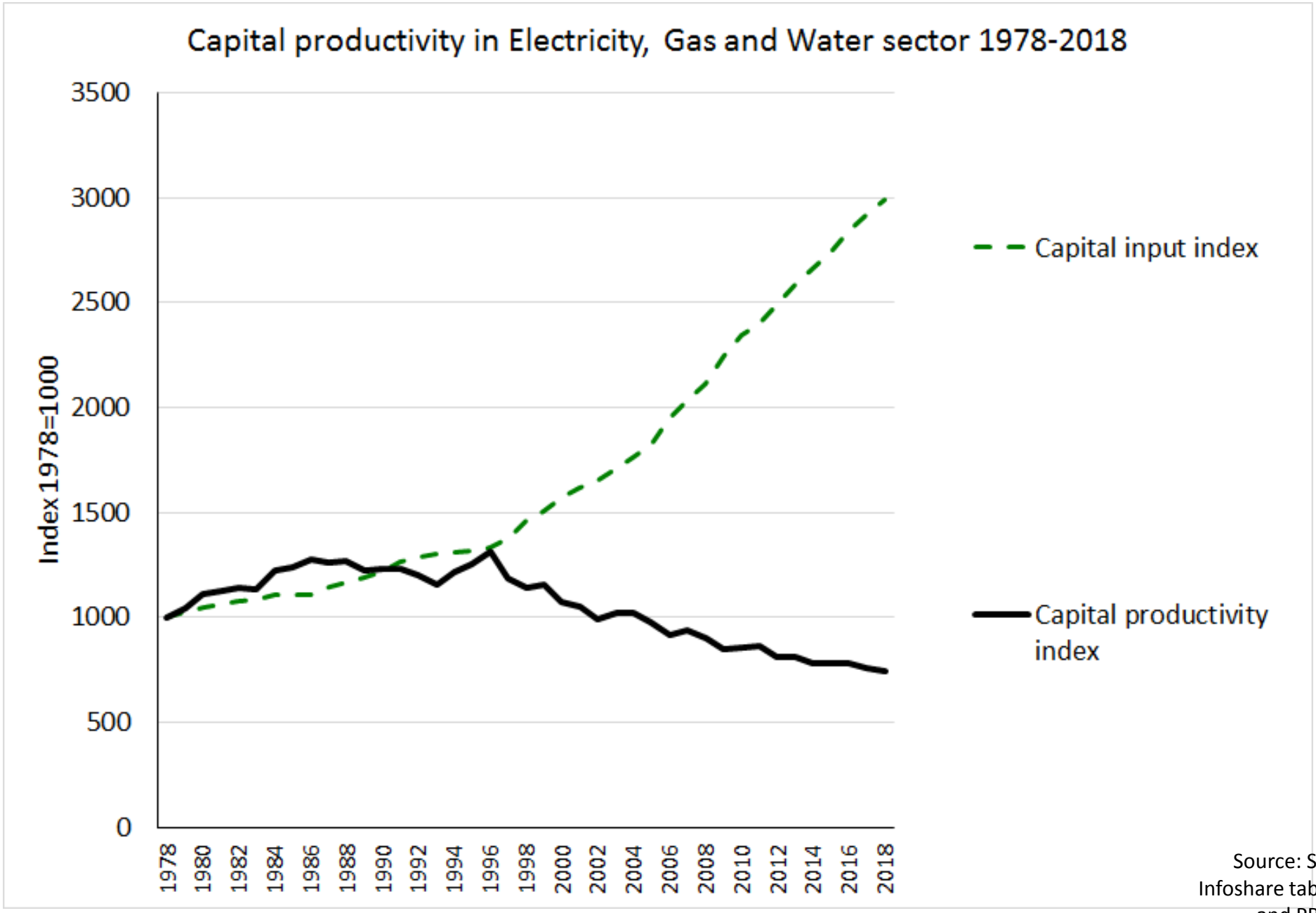
Source: Statistics NZ, *Productivity Statistics 1978-2018 – productivity by industry* https://www.stats.govt.nz/assets/Uploads/Productivity-statistics/Productivity-statistics-19782018/Download-data/productivity-statistics-1978-2018-productivity-by-industry.xlsx accessed 20 May 2019, Table 5.03.



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

Who said this?

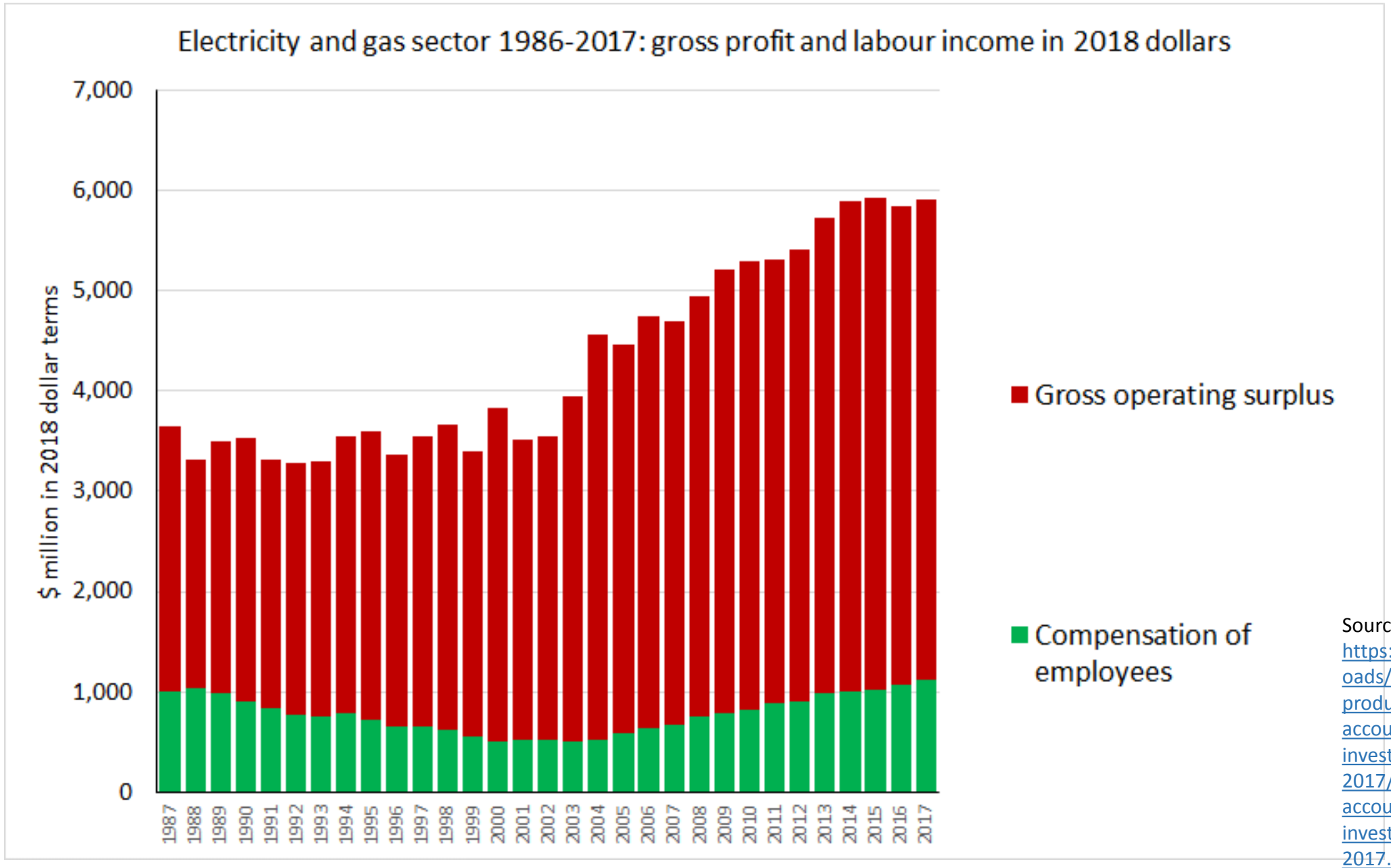
"For the past generation, the electricity industry has been a key testing ground for neoliberal economic philosophy: namely, the idea that industries function most efficiently, and can best meet the needs of consumers, when the role of government is minimised, and key decisions regarding investment, 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.

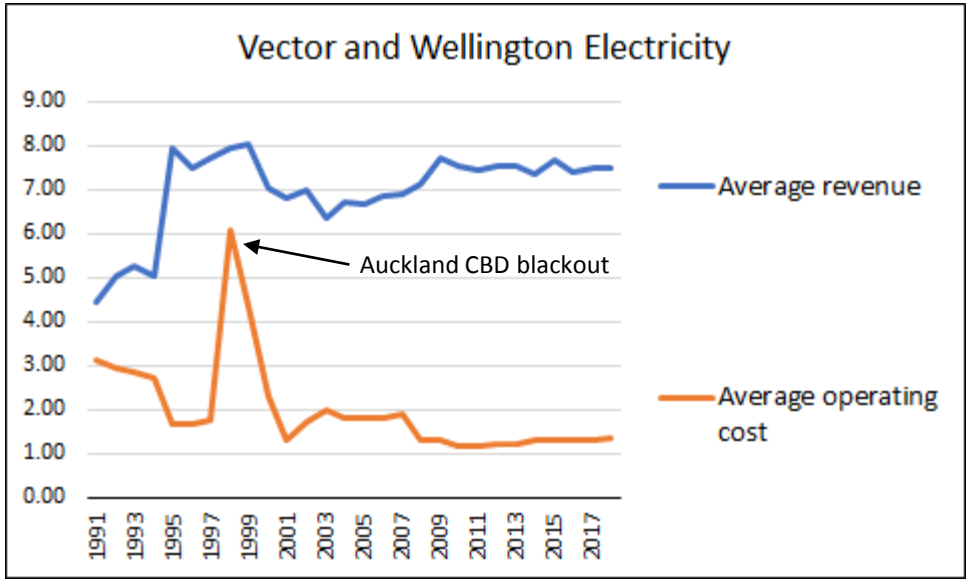
Profits, however (of course, if you're only a little bit cynical), have been healthy!

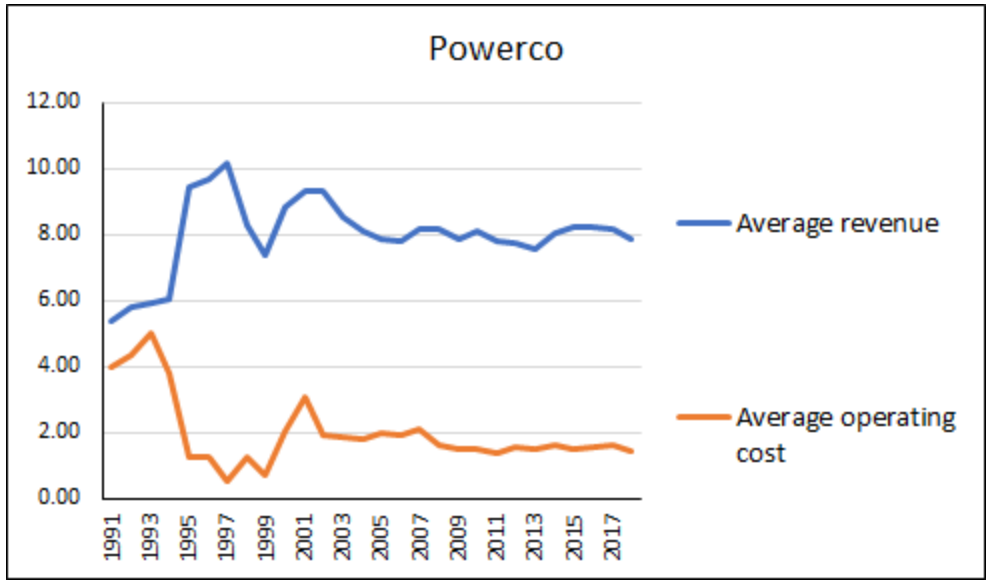


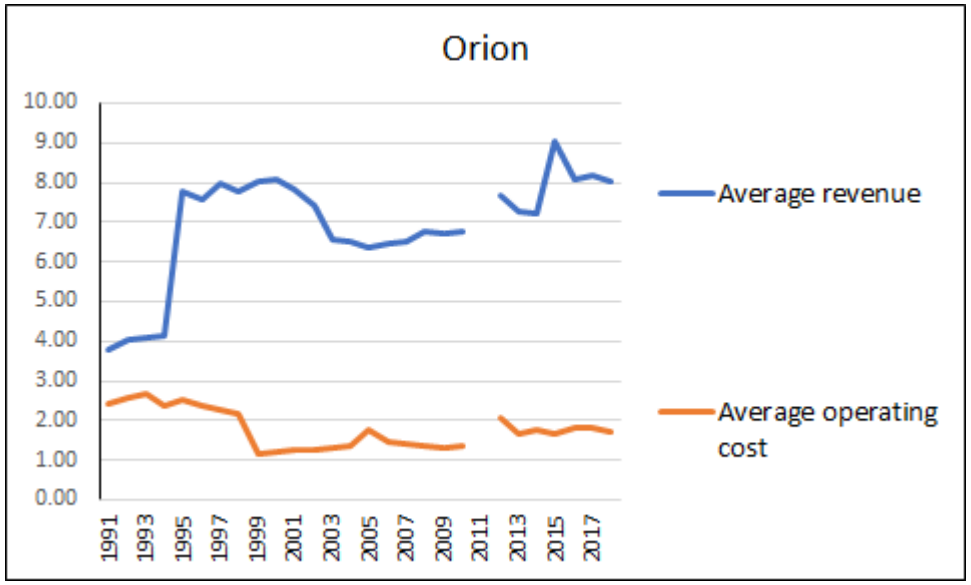
Source: Statistics NZ https://www.stats.govt.nz/assets/Uploads/National-accounts-industry-production-and-investment/National-accounts-industry-production-and-investment-Year-ended-March-2017/Download-data/national-accounts-industry-production-investment-year-ended-march-2017.xlsx downloaded 20 May 2019.

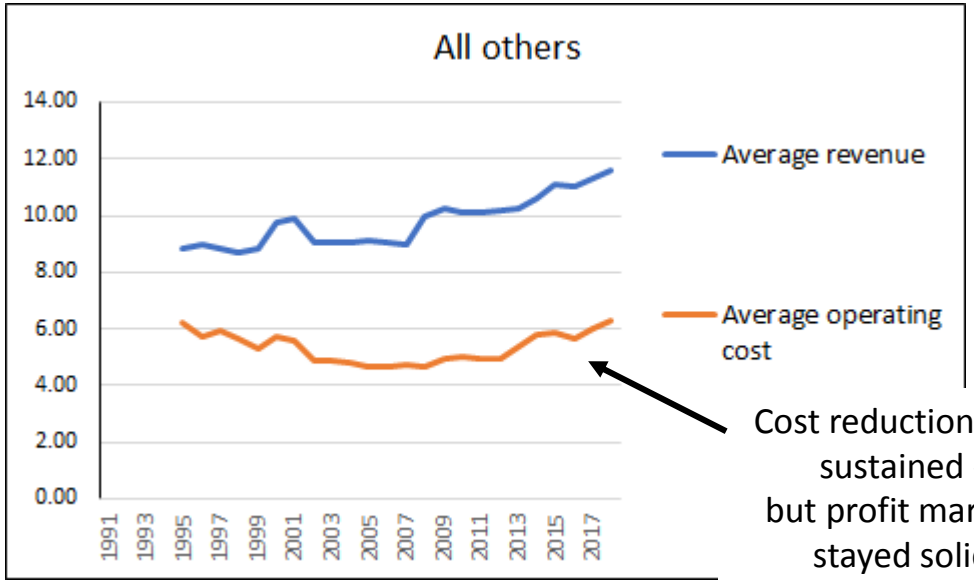
Price-cost margins in **distribution lines networks** ballooned after 1994, as costs fell with no pass-through to prices

All in real terms, 2018 cents per kWh

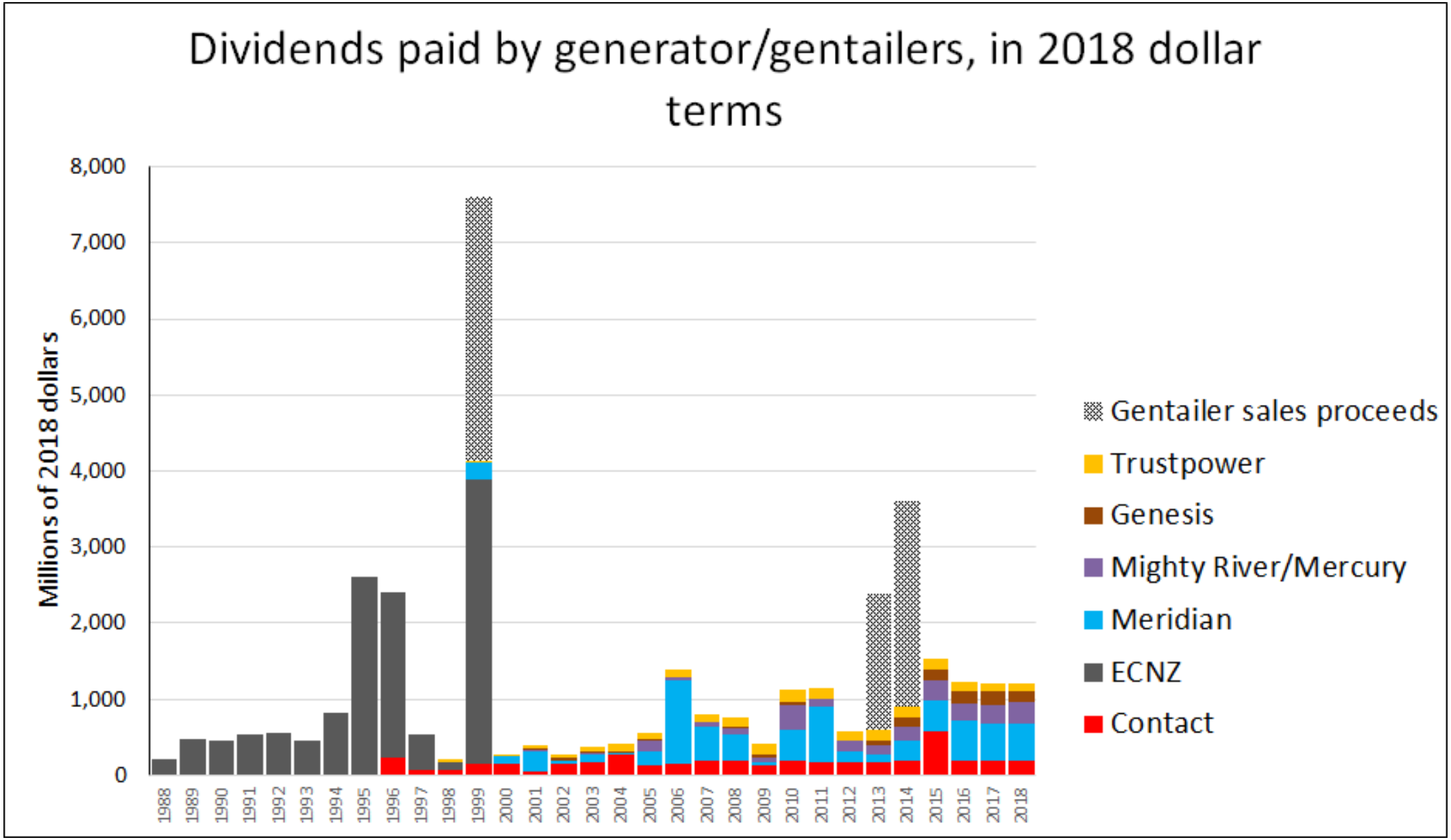








Cost reductions not sustained -
but profit margins stayed solid


Dividends paid by generator/gentailers, in 2018 dollar terms
Millions of 2018 dollars
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
1988
1989
1990
1991
1992
1993
1994
1995
1996
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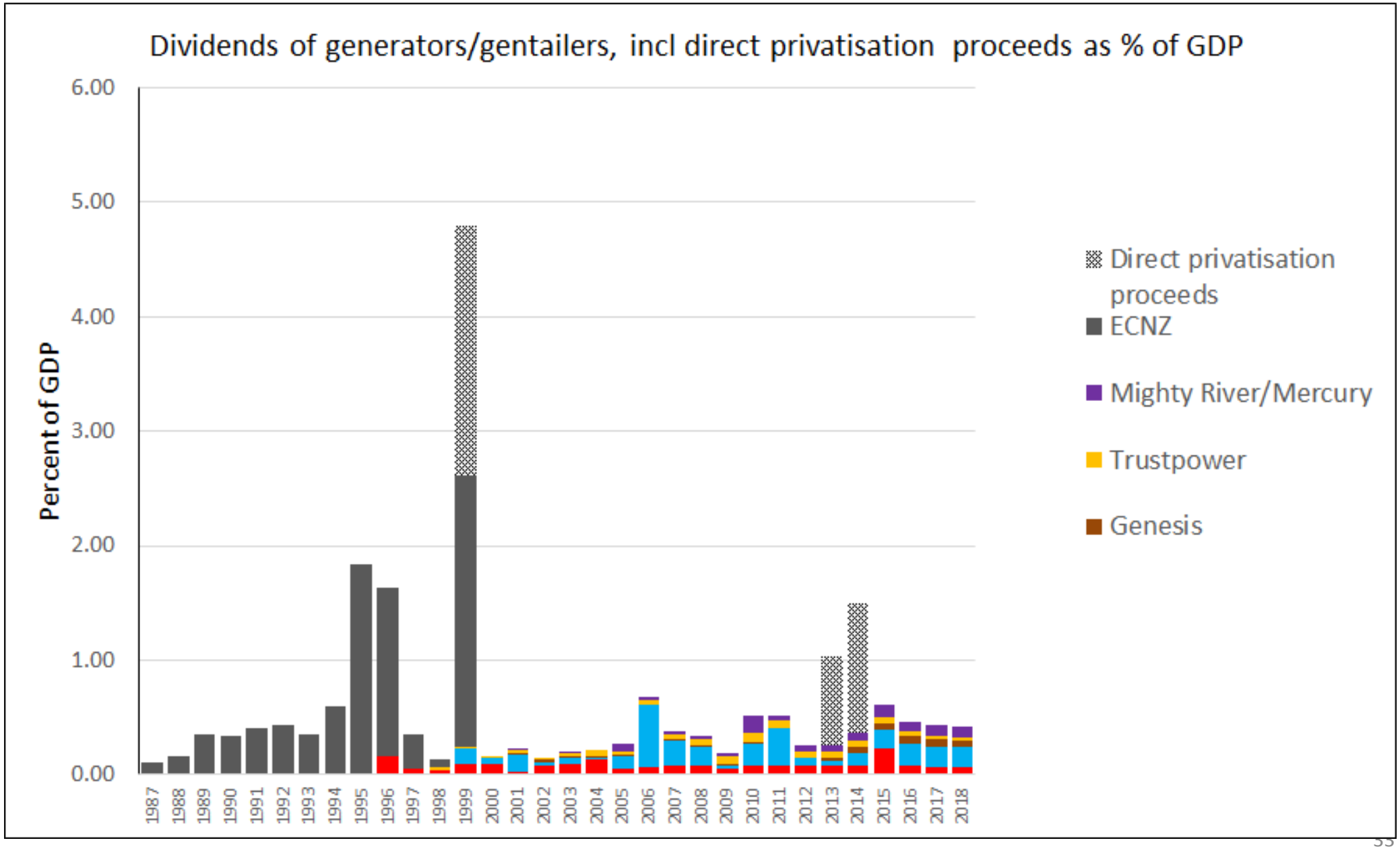
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Gentailer sales proceeds
Trustpower
Genesis
Mighty River/Mercury
Meridian
ECNZ
Contact

These are not trivial sums relative to the economy as a whole


Dividends of generators/gentailers, incl direct privatisation proceeds as % of GDP
Percent of GDP
6.00
5.00
4.00
3.00
2.00
1.00
0.00
1987
1988
1989
1990
1991
1992
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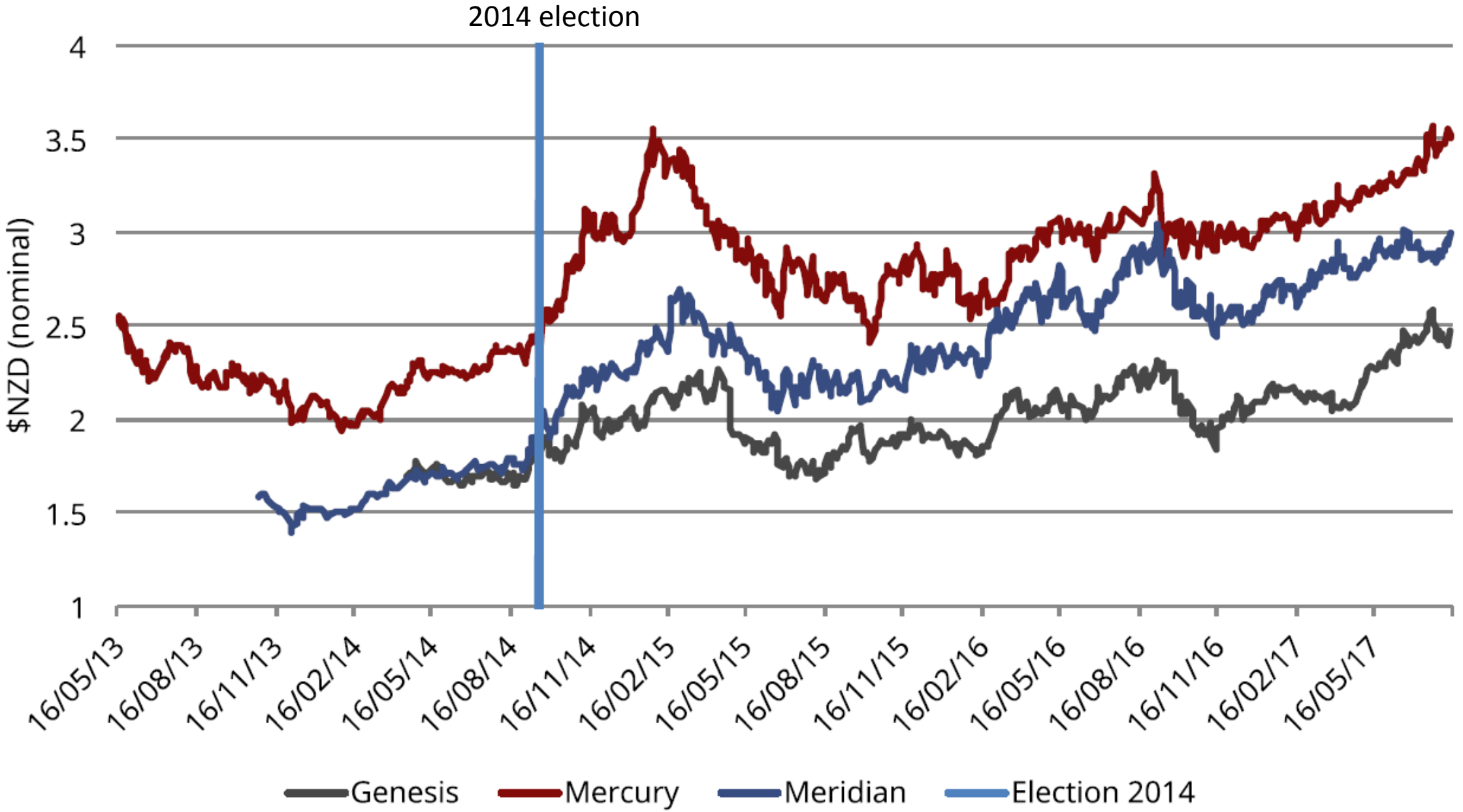
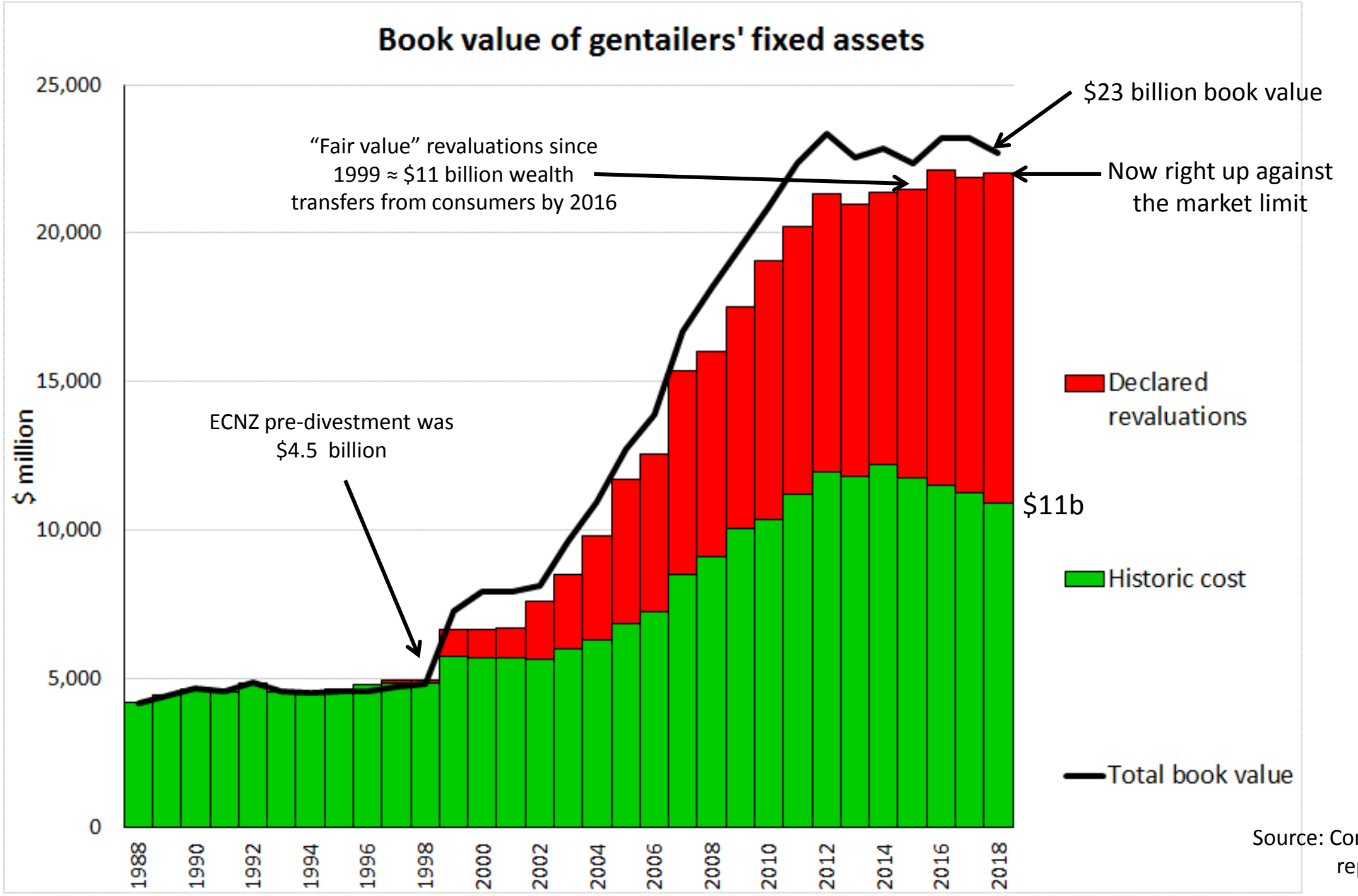
2011
2012
2013
2014
2015
2016
2017
2018
Direct privatisation proceeds
ECNZ
Mighty River/Mercury
Trustpower
Genesis

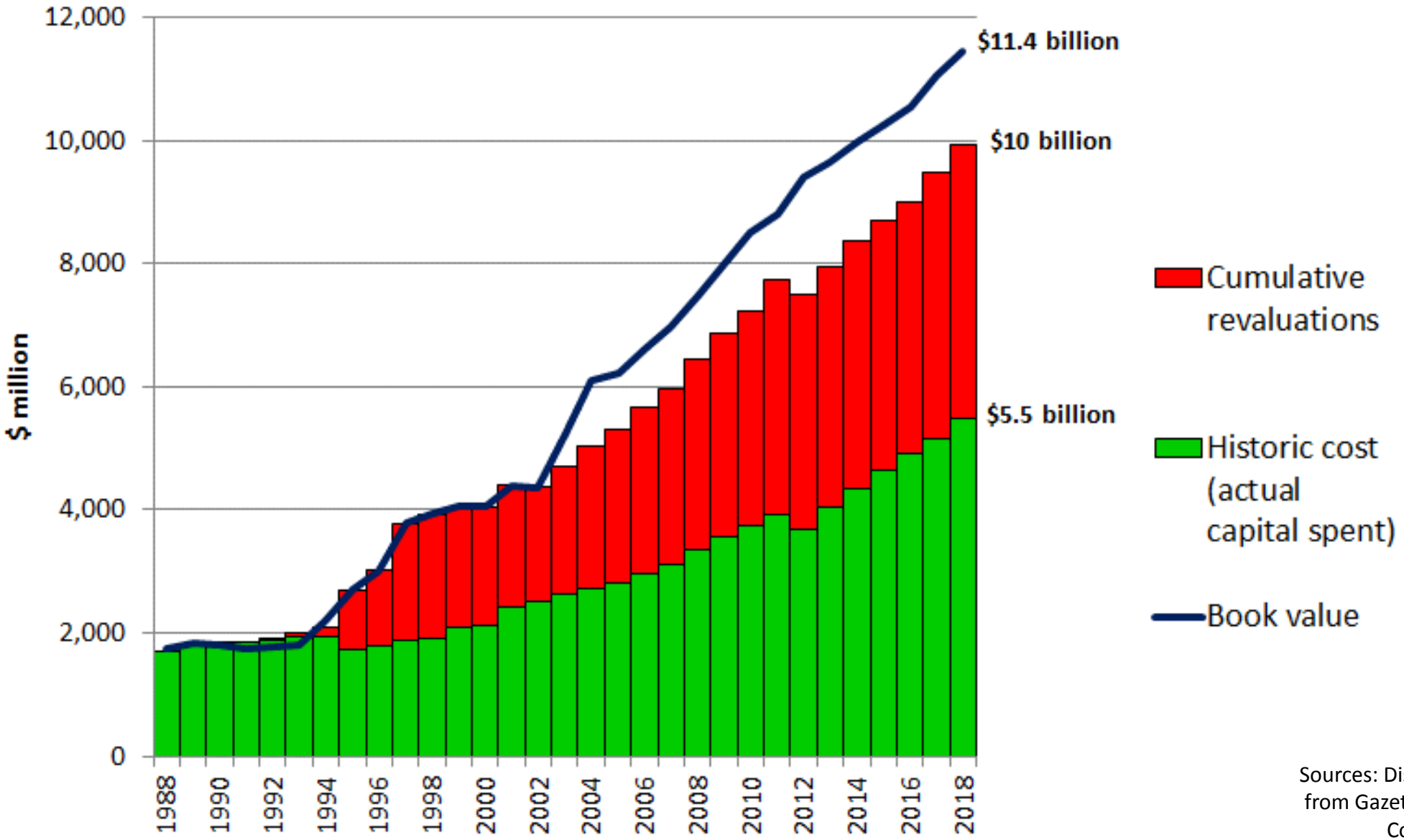
Figure 2: Share price - Mercury, Meridian, Genesis





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 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 => 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

Back to that quote from Baker (2019): add his next paragraph!

"… the Chicagoans were making a wager. The bet was that these efficiencies would more than compensate for any increased risk of firms exercising market power. If it worked, consumers would obtain long-term welfare benefits over and above any losses associated with anticompetitive practices.

"**We now know that the Chicagoans lost their bet**. Since the implementation of antitrust deregulation, market power has widened, without accompanying long-term gains in consumer welfare. Instead, economic dynamism and the rate of productivity growth have been declining. The harms from the exercise of market power have extended beyond the buyers and suppliers directly affected to include skewed economic growth and a skewed distribution of wealth. Whatever efficiency gains the Chicago-inspired changes may have achieved have not compensated for the market-power effects of the antitrust deregulation they sought."

Jonathan B. Baker, *The Antitrust Paradigm: restoring a competitive economy*, Harvard University Press, 2019, p.2

Necessary and sufficient conditions

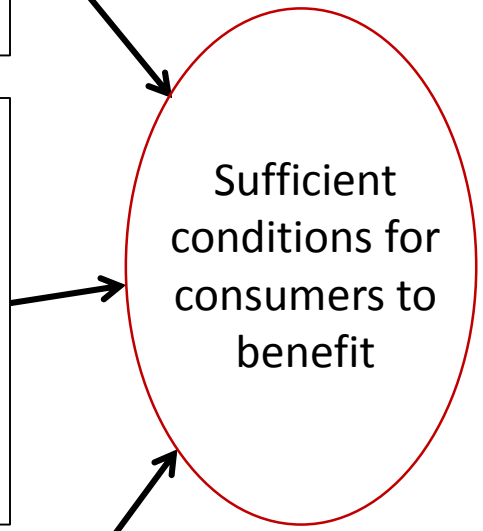
- The sufficient condition for success of a policy is that all the necessary conditions are met – not just some
- A simple example is the history of the distribution lines networks. For consumers to benefit from corporatisation, two necessary conditions were that
  1. Costs be reduced without harming quality of supply; and
  2. Cost reductions be passed through to prices
- What actually happened was that 1. costs were reduced but 2. prices went up, not down – there was negative pass-through!
- So all benefits went to the asset owners, and consumers ended up worse off

The pure deregulated market model

1: Objectively, there has to be genuine potential for gains in the overall package of cost-efficiency, quality of service, openness to innovation, and creative response to emerging challenges

2: a switch to commercially-minded management must be the most effective means to achieve gains on at least one of those dimensions without undue sacrifice of others [note that the *status quo ante* is always a relevant alternative]

3: competition must be sufficiently strong to force the passing-through of cost reductions to lower prices, and specifically to lower prices for the least-advantaged consumers (low-income households)



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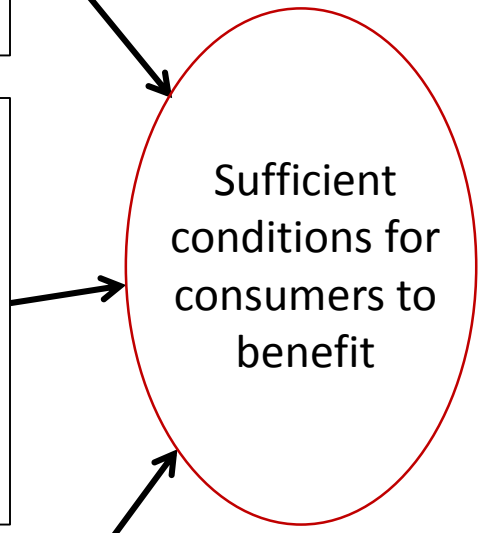

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Sufficient conditions for consumers to benefit

The pure deregulated market model

How about adding regulation?

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4: the state must be credibly prepared to implement regulation if exercise of market power is detected

5. Regulation must be of a form that forces efficiency gains to be passed through to prices with no loss of service quality

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Back to the big picture

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 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 set their prices and asset values meant putting a floor, not a cap, on lines charges (“regulatory capture”)

6. Regulating lines company revenue but not price 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

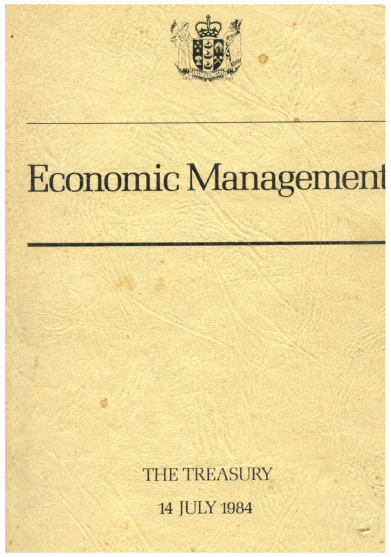
8. The current market design forces consumers to pay more for renewable electricity as the carbon price goes up => windfall profits for hydro and geothermal owners => strong incentives to keep fossil fuels going at the margin

Just a quick word about those last two…

The flip side of the neoliberal coin:

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

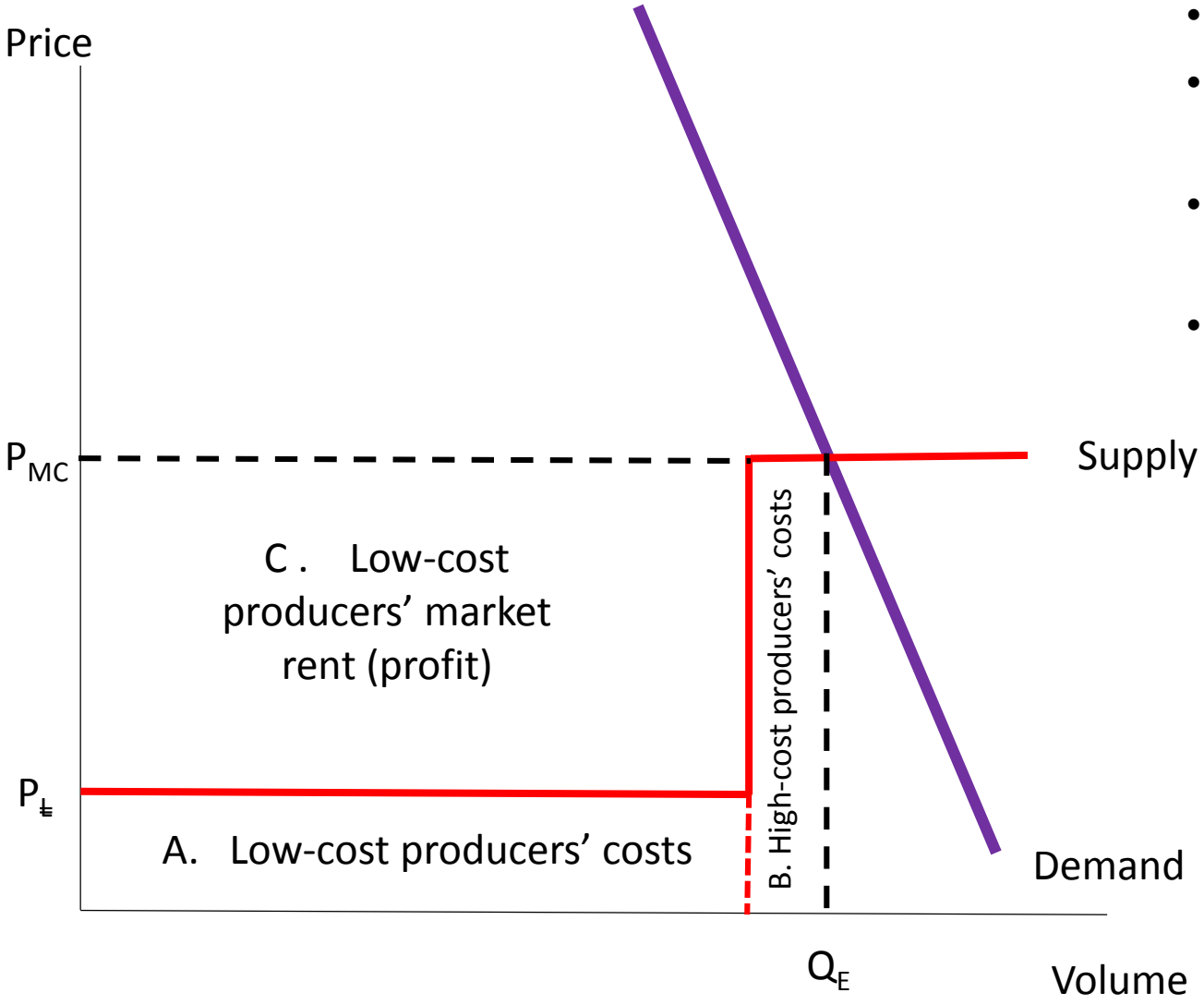
“True cost…”



“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

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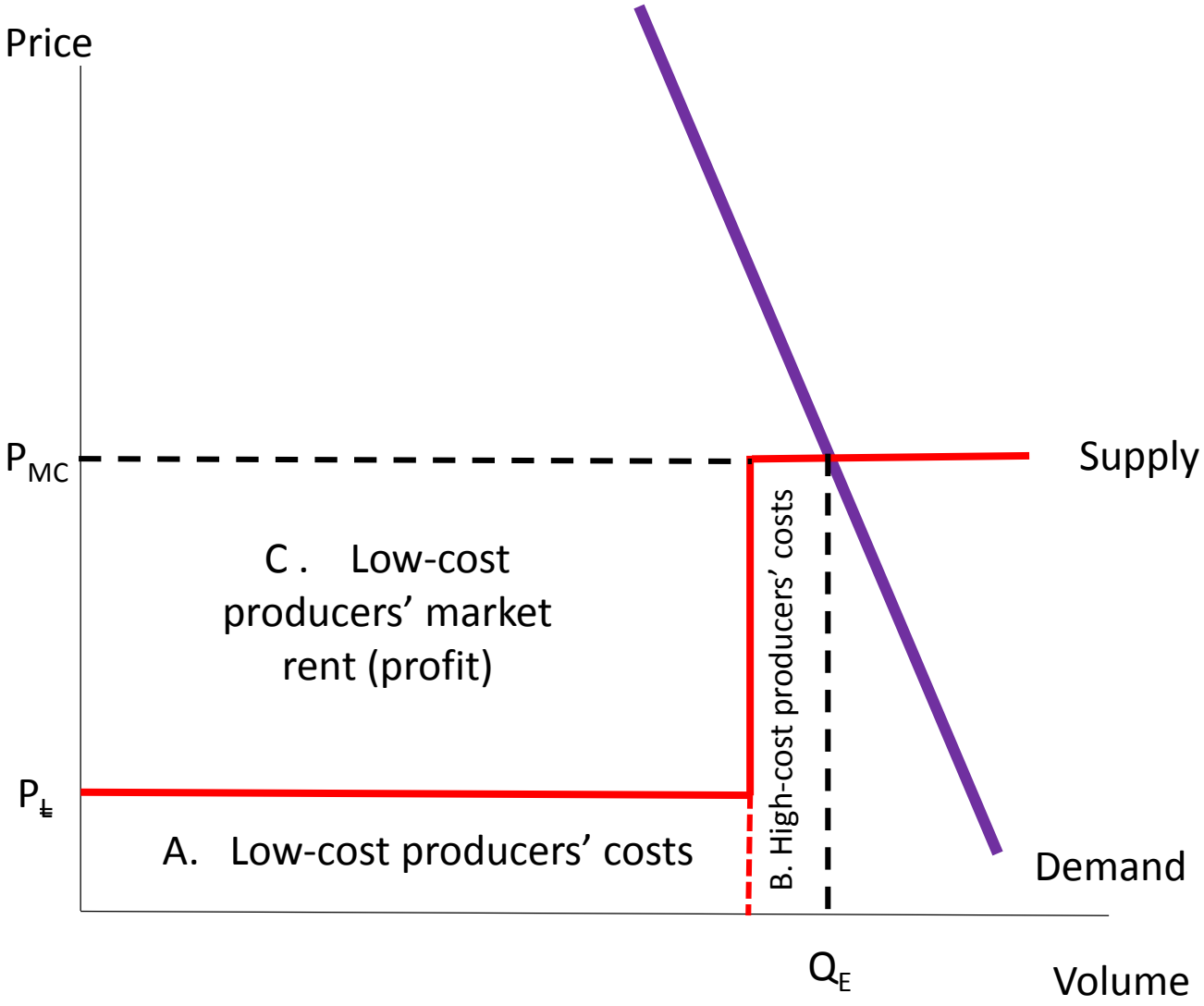

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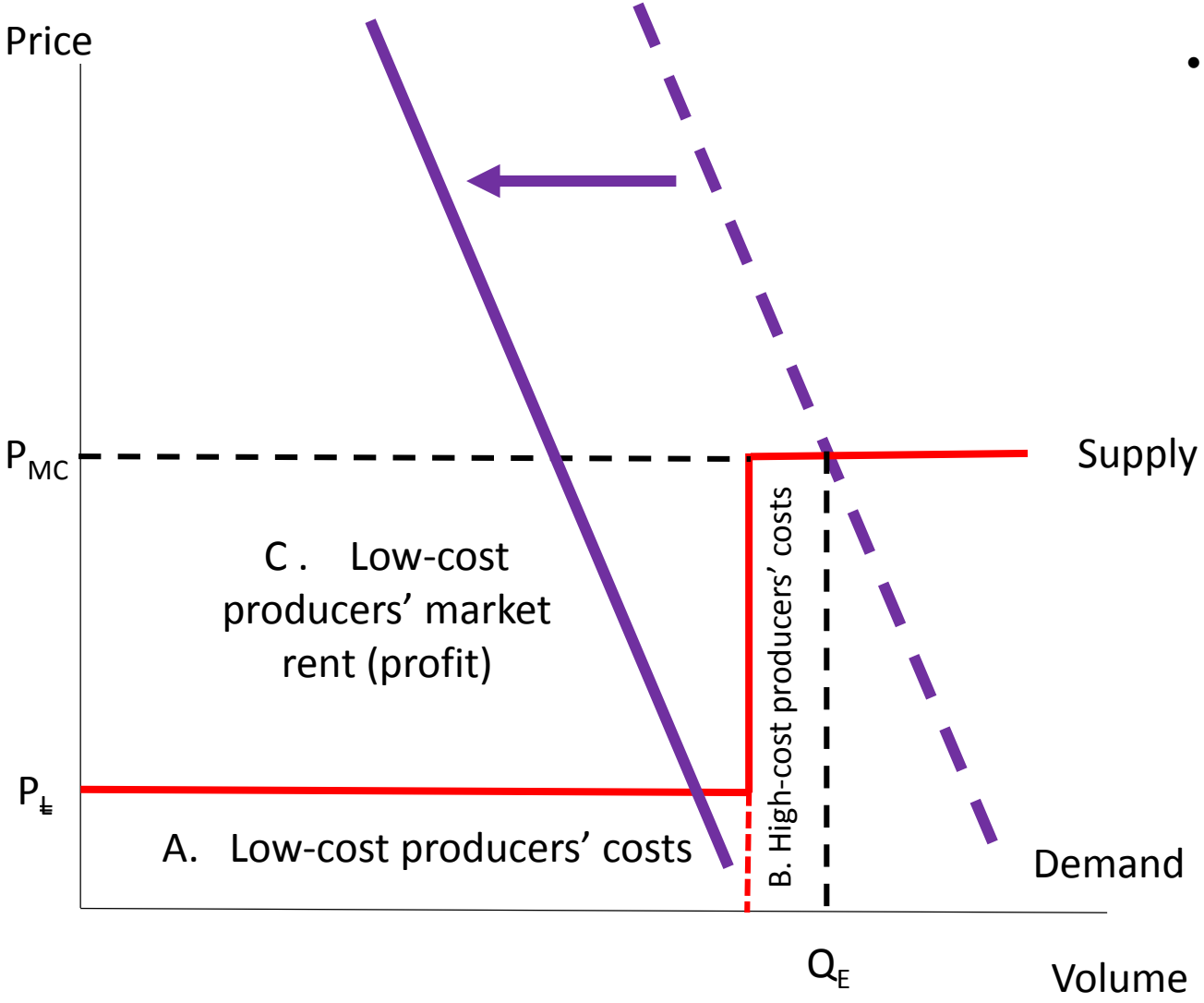

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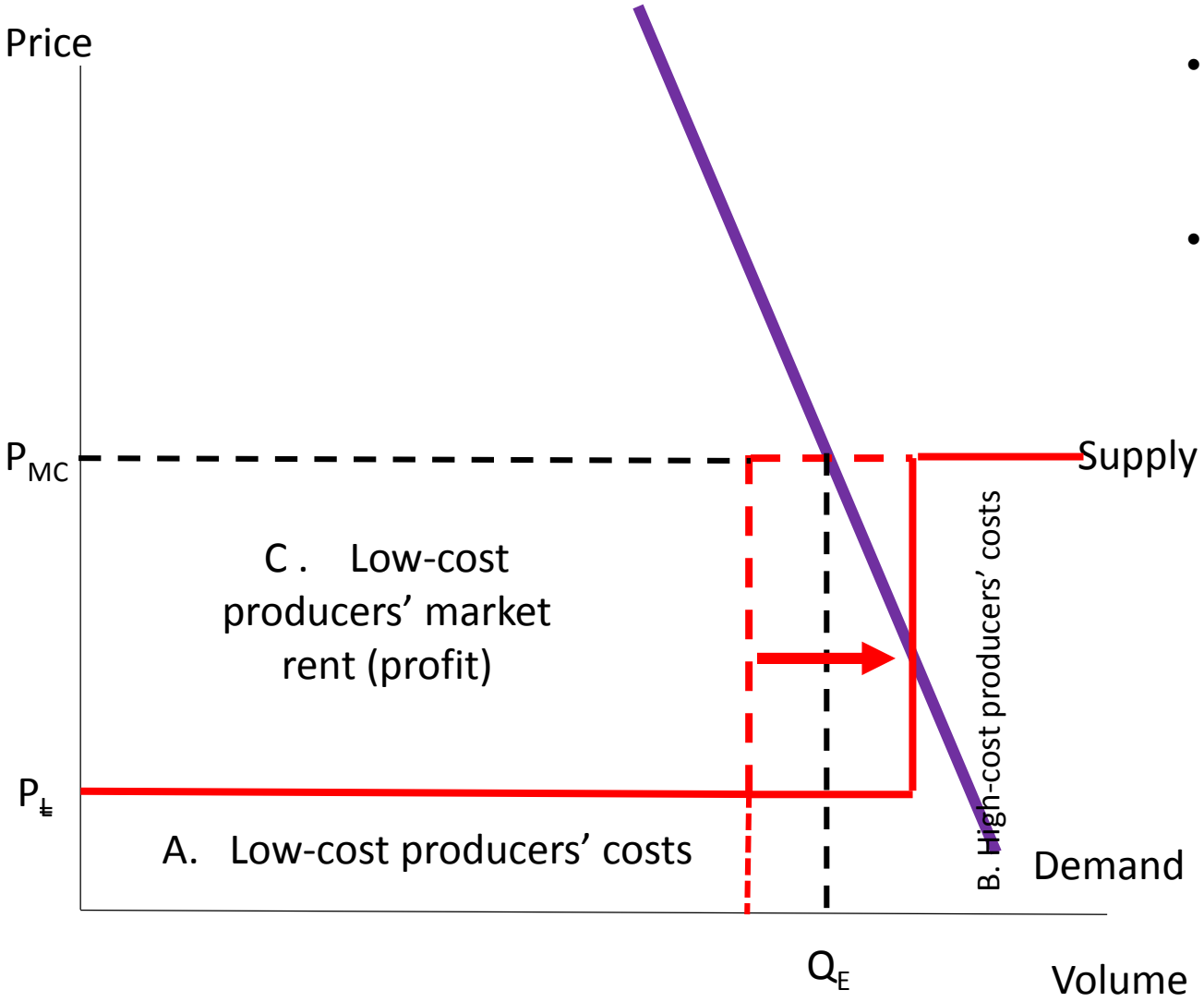

- Those big profits C rely entirely on having high-cost supply at the margin
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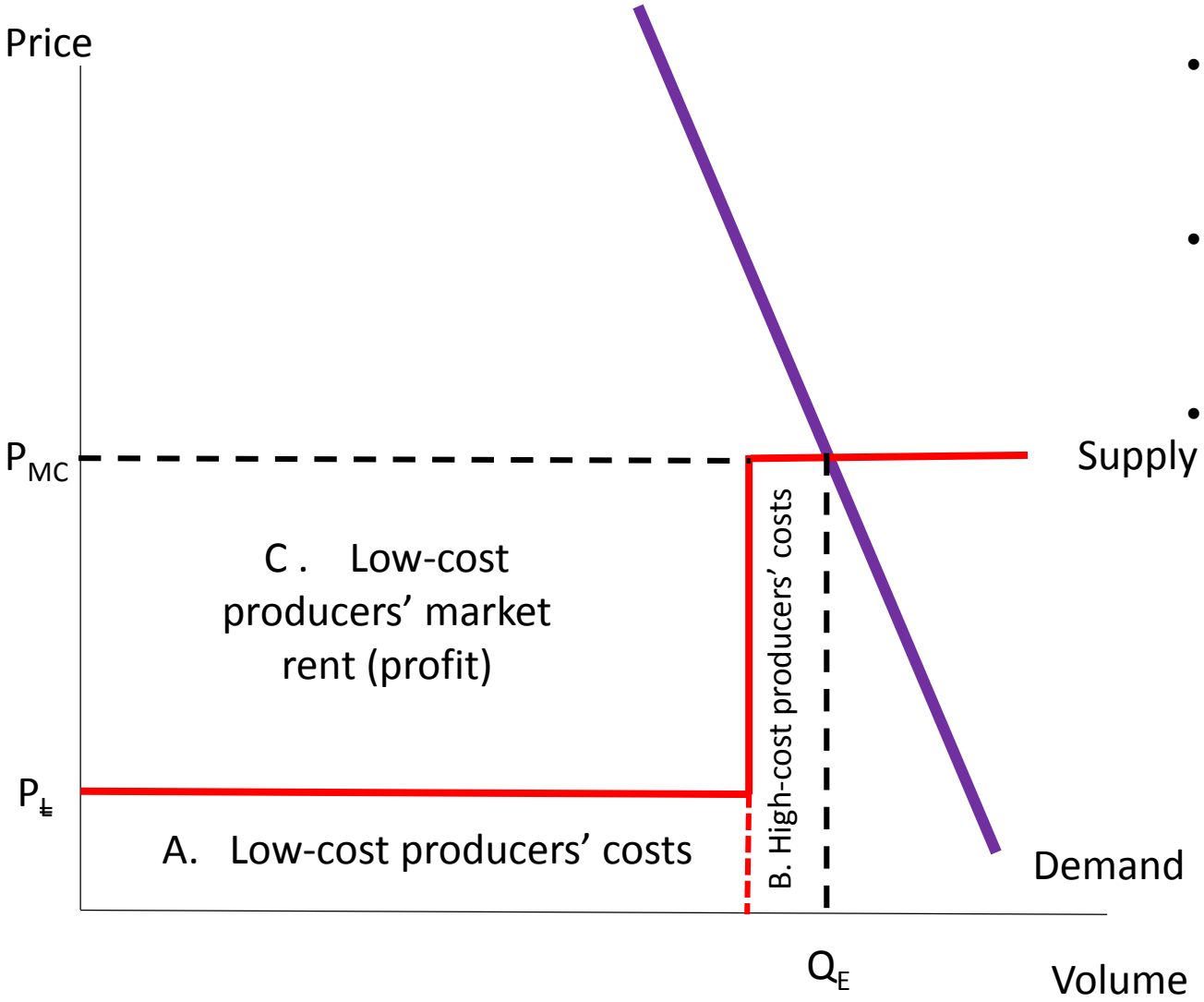
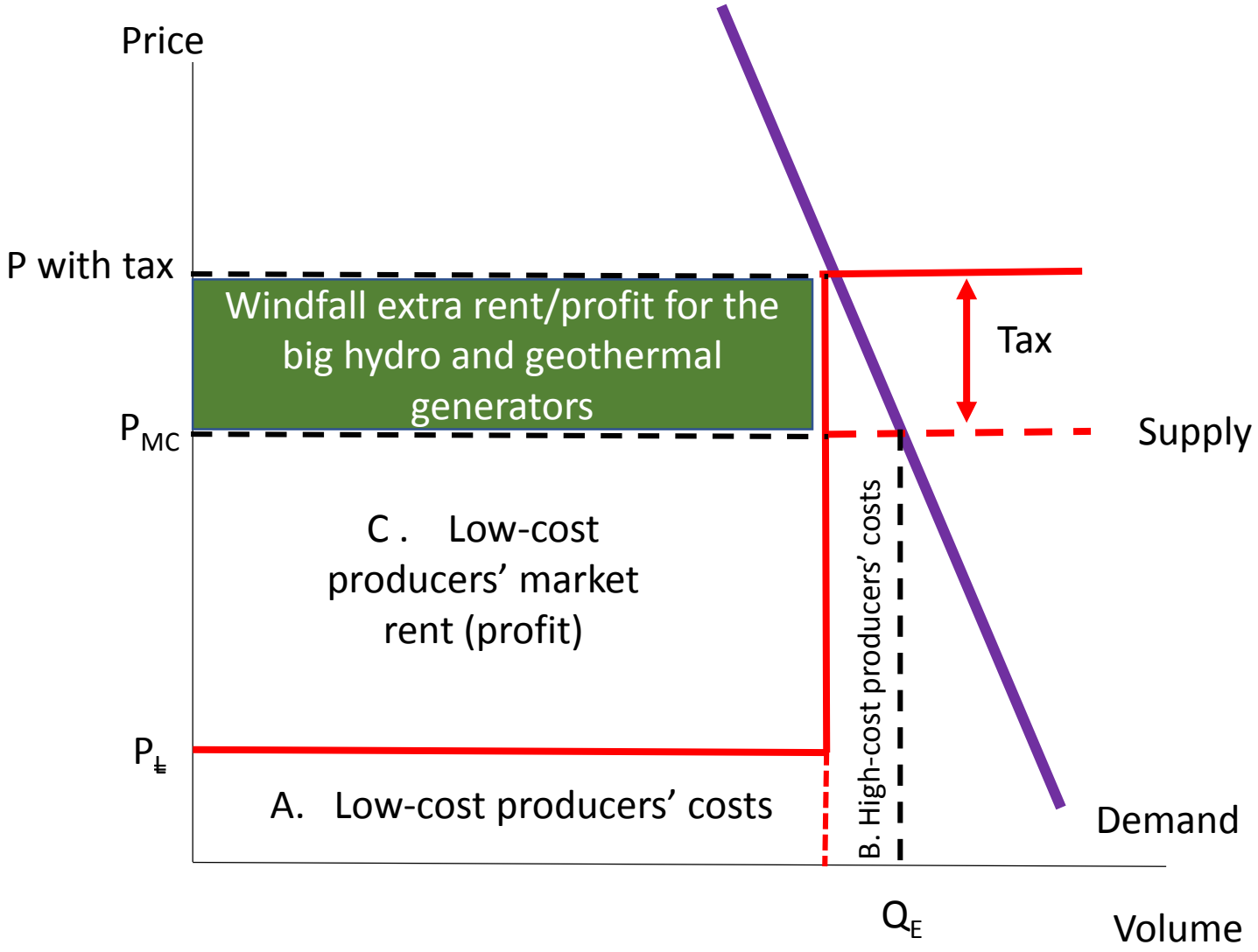


- Those big profits C rely entirely on having high-cost supply at the margin
- Shift the demand curve left (e.g. close the Tiwai Point smelter) and the price drops radically – and so do profits
- Add more low-cost supply, pushing the high-cost suppliers out (off the margin) and the price drops radically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

Keep demand up (keep the 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:

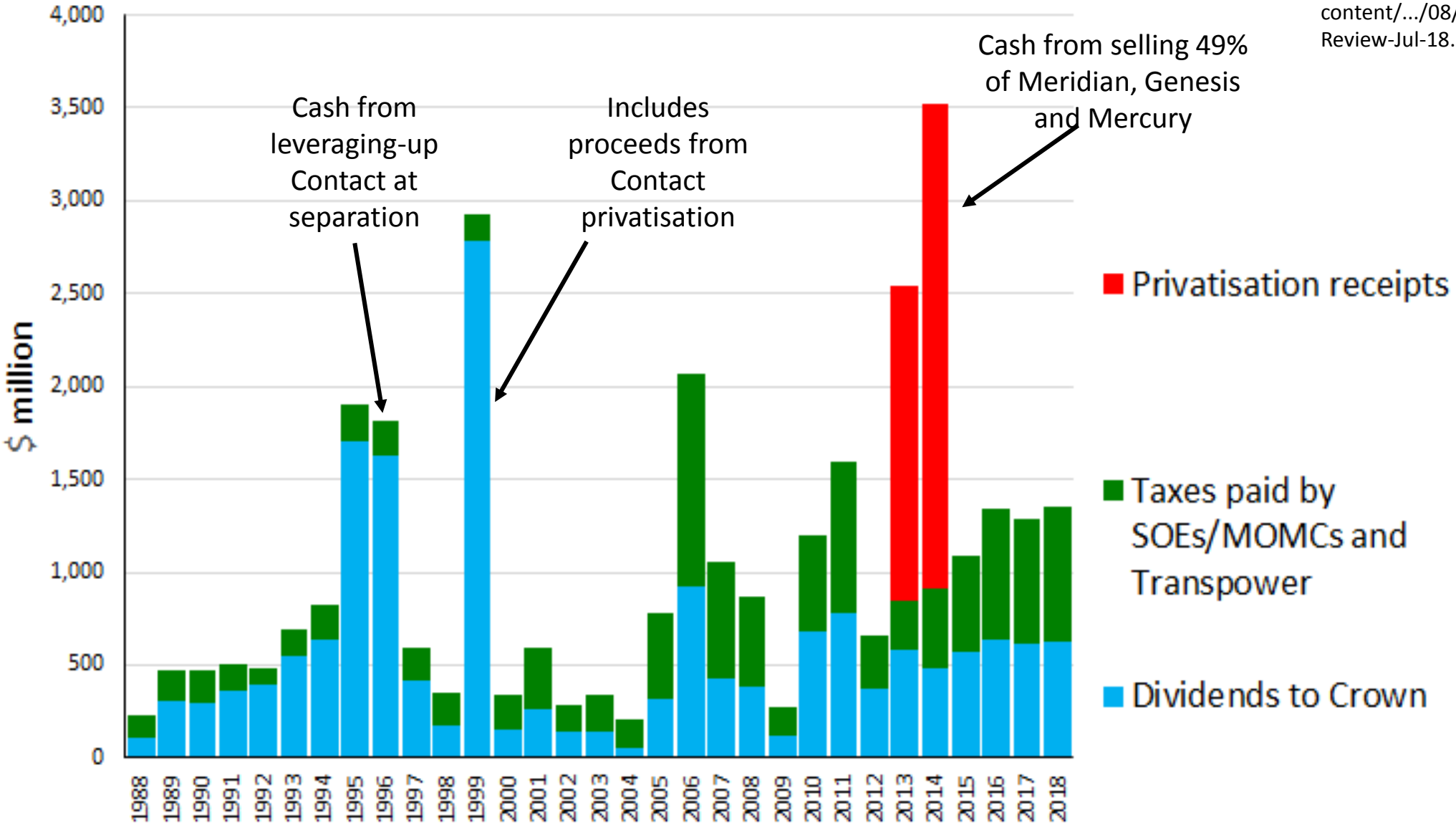


Here's how to make the Emissions Trading Scheme a recipe for re-carbonisation of the economy

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
  - Incentives matter, even for the Minister of Finance

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

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 secure installed 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 rents and excess profits are stripped out of the supply chain; commercial and industrial user don’t need the relief
  - $\Rightarrow$ 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 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 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
- Augment or abolish the 10MW limit 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 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
- 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:

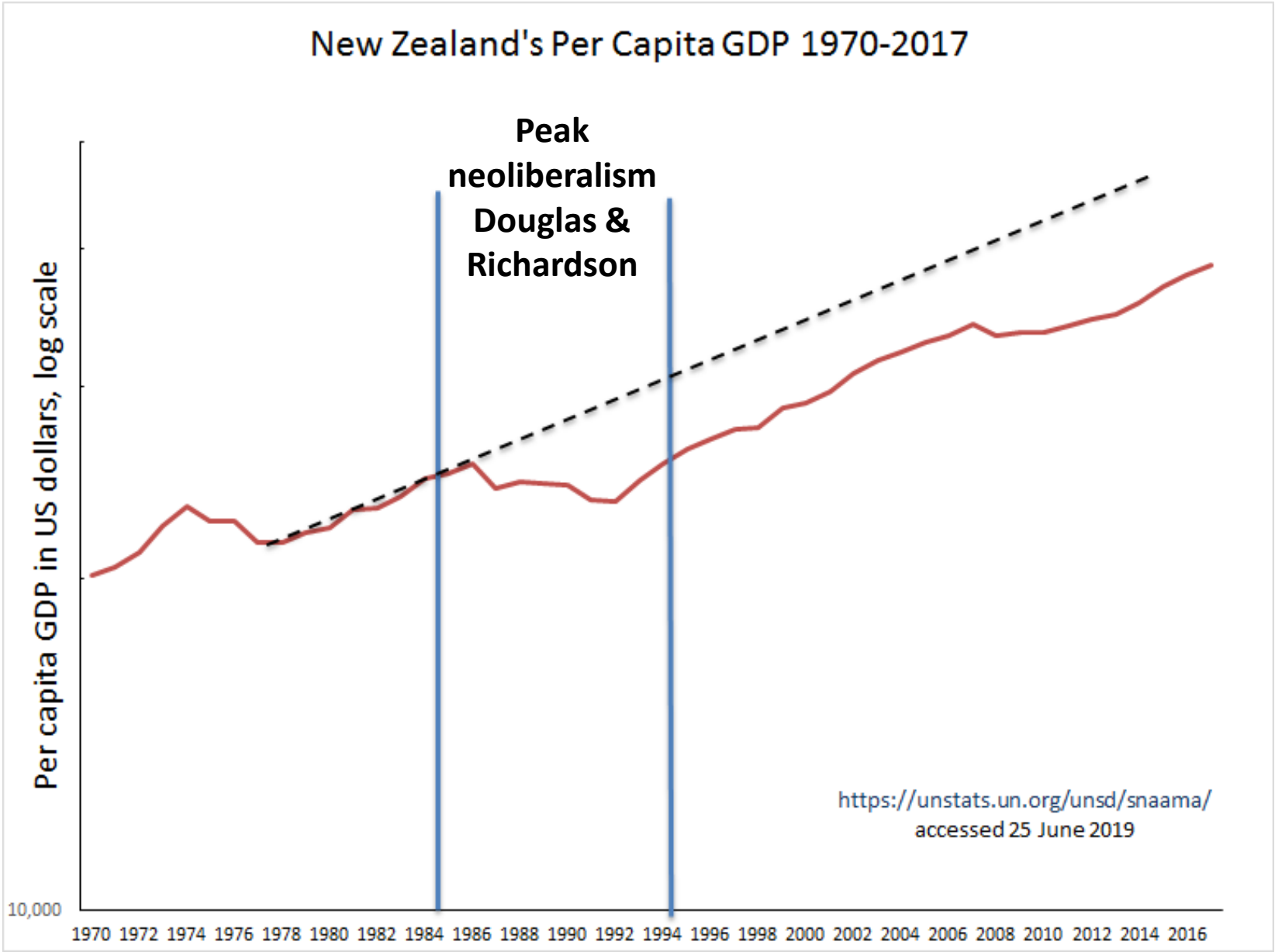
  - Insist on a level playing field for entry to the market by distributed generation (rooftop solar, larger solar arrays, independent wind and micro-hydro, local community pools with battery storage) with net metering arrangements
  - Ensure that disclosed information is analysed and prominently displayed 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

In the real world as it is

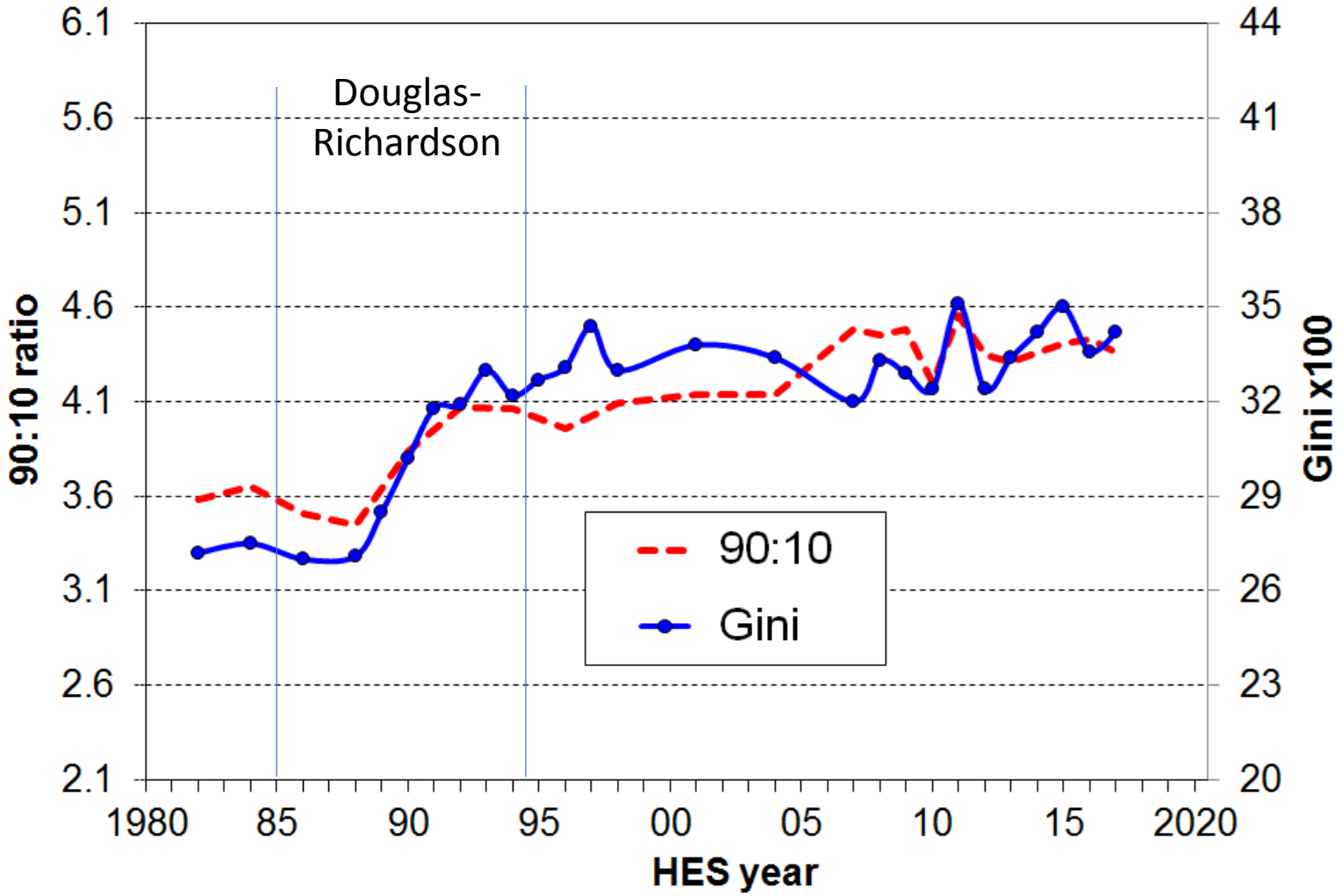
- Give money (Winter Energy Supplement) to household consumers to help them pay their bills (in the process shifting the market demand curve right, adding cash to the industry's rentiers)

Just a final reminder: electricity was not an exception –this was at the heart of the neoliberal project, and the results were not a surprise - if you were watching closely

Elsewhere in the wider economy:


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.