Economic rents in industry sectors in New Zealand

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1. Introduction

Gross Domestic Product is distributed in the first instance in the form of three factor income flows (wages, profits, and rent) to three claimants – labour, capital, and "land" (whose definition we extend here to include the stock of all non-produced assets, ownership of which confers the ability to lay claim to a share in the total product). In practice, the standard national accounts procedures do not exactly match this analytical scheme, for two reasons:

- The national accounts make no distinction between profits and rent, bundling them together under the heading "gross operating surplus", and then further bundling them with the income of the self-employed which is called "mixed income" because it consists of all three categories of factor income.
- The national-accounts item "compensation of employees" includes only the wages and salaries earned by people in an employment relationship with some employer. It does not include the labour income of the self-employed, which is included in "mixed income".

In addition, the national accounts may fail to include, or may mis-classify, some produced assets – for example, some intangible assets – the profits (capital income) on which ought to be recognized.

In recent work we have sought to disaggregate the bundled item "gross operating surplus and mixed income" between profit and rent, using a model developed by Barkai (2020). Barkai's procedure is to use the economy's history of gross capital formation, in combination with a cost-of-capital measure drawn from financial economics, to estimate the required (or warranted) return on the total net capital stock. This is then treated as his measure of the legitimate size of profit, which he subtracts from total gross operating surplus and mixed income to obtain a residual measure of excess return which we here call "Barkai-rent".

In two previous papers to this conference we derived estimates of Barkai-rent for New Zealand, using data for the total economy with owner-occupied property excluded. Two shortcomings of those estimates were that they were biased downwards by our inability to conduct detailed analysis at industry level focusing solely on market-sector activity (that is, production of goods and services that are sold in markets) while excluding non-market activity; and the fact that our rent estimates were biased upward by inclusion of the labour income of the self-employed.

In this paper we use new data supplied by Statistics New Zealand to undertake the decomposition by ANZSIC06 industry of "gross operating surplus and mixed income", with nonmarket activity excluded. We then subtract, from our Barkai-rent results, hypothetical estimates of the labour income of the self-employed. In principle this is a move towards a rent

measure as close as possible to the essential concept of income appropriated by the owners of non-produced assets – ranging from land as commonly understood (natural resources in general) to intangibles such as scarce skills and market power, all of which command rents of various sorts. In practice the labour incomes attributed to the self-employed in this paper are generous, designed to identify the range over which our rent estimates could be changed by hypothetically rewarding self-employed labour on an equal footing with wage labour.

We investigate in principle the issue of possible unrecognised intangible capital assets, to see whether they might make any major difference to our results.

Finally we offer some methodological reflections on the Barkai (2020) model itself, in the light of our application of his method to the New Zealand data.

2. **Our estimate of economy-wide Barkai-rent in New Zealand, 1950-2022**

Figure 1 (using real dollar numbers CPI-deflated to 2020 prices) and Figure 2 (in terms of percentage of GDP) show our earlier results for the economy as a whole, now revised to exclude non-market activities and updated to the March year 2021. Box 1 sets out the equations of the Barkai model. The procedure is to track the economy's cumulative annual gross fixed capital formation, assigning to each year's investment a "required" (or "warranted") return corresponding to the cost of capital in that year (with expected capital gains included). Summing across all vintages of still-existing capital net of depreciation classified into three asset types gives the required flow of current income to cover the expected return on fixed capital. Comparing this with actual gross surplus leaves a residual which we call "Barkai rent". For further detail see Bertram & Rosenberg (2022).

Over the first three decades of our data 1950-1980 the dollar value of Barkai-rents, as estimated by the Barkai (2020) model, held steady (Figure 1), but their share of GDP at factor cost dropped from 35% in 1950 to 9% by 1980.

More recently, the three decades since 1990 have seen a steady rise of the Barkai-rent share from nothing in 1990 to 8% of market GDP in 2000 and 23% by 2021, at which point the dollar total had reached over $50 billion. This startling increase in income being appropriated as surplus over and above the required return on capital investment has obvious resonance in an era when increasing attention to turning to issues of market power and wealth distribution.

Apart from the recent steep increase in Barkai rents, accelerating since the GFC, the most dramatic feature of Figures 1 and 2 is the way that a late-1980s recession in "gross operating surplus and mixed income" coincided with a sharp upward spike of the required (warranted) return on fixed capital, producing a dramatic apparent squeeze on rents as measured by the Barkai model. (Whether that squeeze was a real effect or a statistical illusion is addressed in the final section of this paper).

Figure 1: $billion at 2020 prices

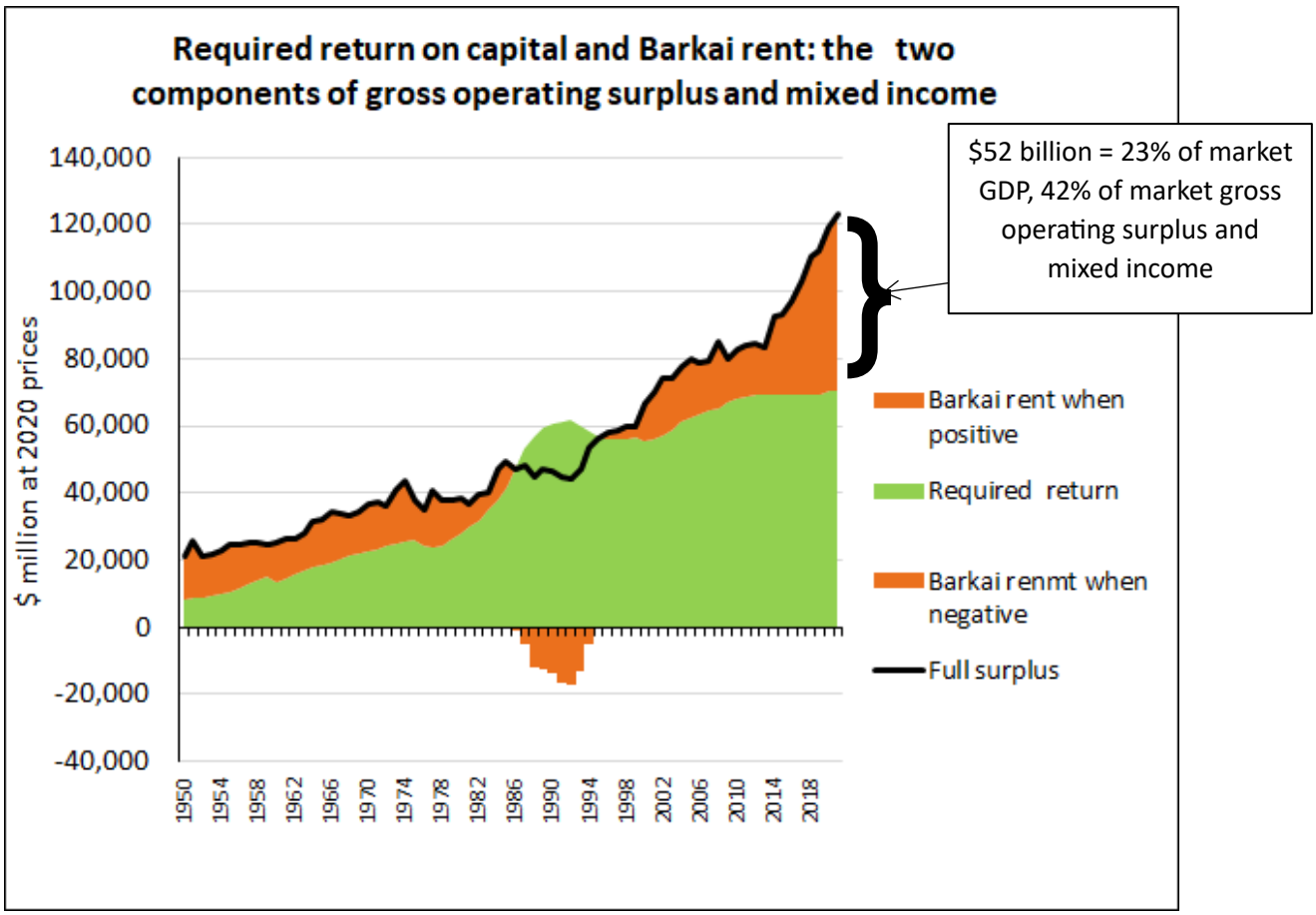
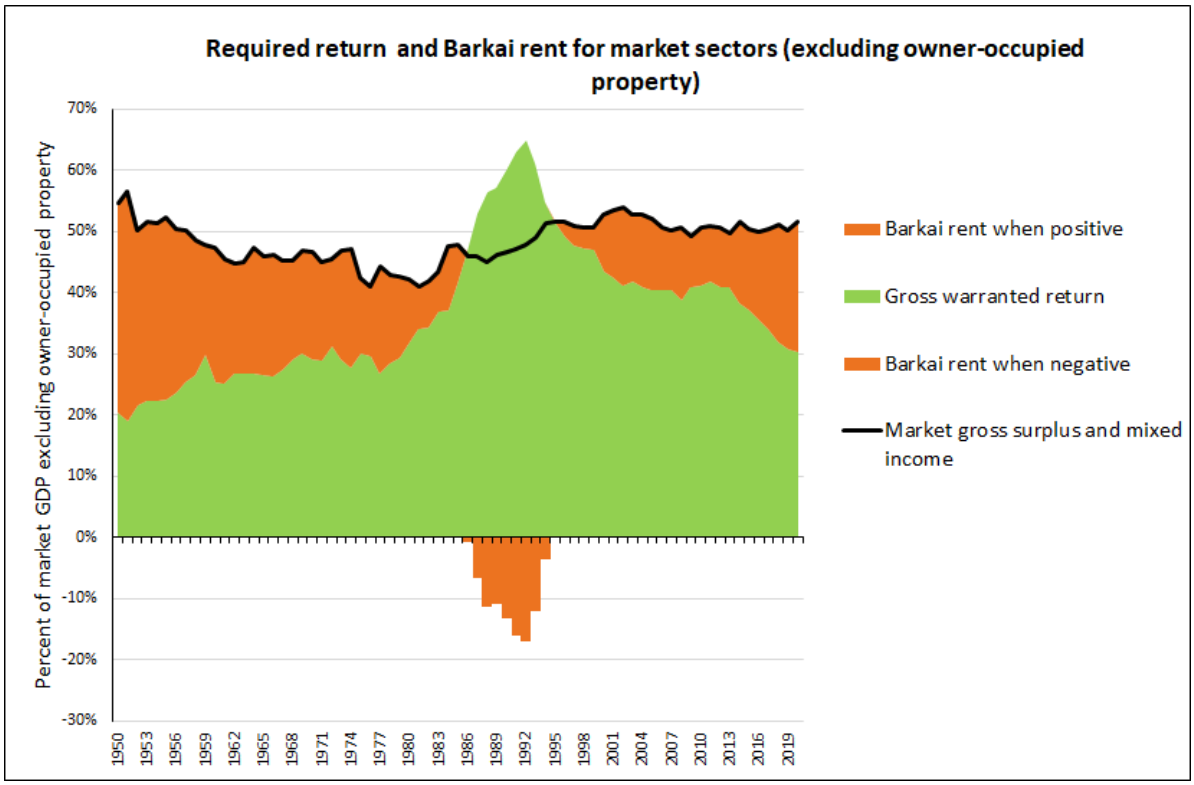


Figure 2: Percent of GDP



Box 1: The Barkai (2020) model

The model calculates the required return on investment in fixed capital assets using a standard framework from microeconomic analysis often applied in regulation of natural monopolies and developed in Hall and Jorgenson's (1967) analysis of the effects of tax changes on investment behaviour. We have made one change to equation (2) in Barkai (2020 p.2425) to allow for the fact that New Zealand does not tax capital gains, and two changes in our notation from previous versions of our working paper. Our equation is:

$$R_t = \sum_s \sum_{y=1949}^{t-1} \left\{ \left[\left(WACC_y \frac{(1-z_y^s \tau_y)}{(1-\tau_y)} - E\left[\varphi_y^s\right] \right) \right] H_y^s + \delta_y^s \frac{(1-z_y^s \tau_y)}{(1-\tau_y)} I_y^s \right\} \frac{P_t}{P_y} \qquad (1)$$

Where

R_t is the required (warranted) return on all accumulated capital, in current dollars, in year *t*, summed across all capital asset types *s*

H_y^s is the depreciated historic cost in year *t* of assets of type *s* installed in year *y* ,

calculated as: $H_y^s = \begin{cases} I_y^s[1-(t-y)\delta^s] \text{ for } (\mathrm{t}-y) \le L_y^s \\ 0 \text{ otherwise} \end{cases}$

I_y^s is the amount invested in capital goods of type *s* in year *y*, with installation of the assets dated at the end of year *y*.

L_y^s is the life of an asset of type *s* installed in year *y*.

$WACC_y$ is the after-tax weighted average cost of capital[1] in year *y*

τ_y is the company tax rate in year *y*

z_y^s is a tax multiplier[2] to capture the present value in year *y* of future tax-deductions on allowed depreciation at rate δ^s , evaluated using the tax rate for that year and with the WACC for that year as the discount rate.

δ^s is the straight-line depreciation rate for assets of type *s*

δ_y^s is the straight-line depreciation rate for assets of type *s* up to the moment when they are fully depreciated, calculated as: $\delta_y^s = \begin{cases} \delta^s \text{for } (\mathrm{t}-y) \le L_y^s \\ 0 \text{ otherwise} \end{cases}$

$E\left[\varphi_y^s\right]$ is the expected (in year *y*) rate of change in the price of capital goods of type *s*

P is the consumer price index

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1 Calculated as $\mathrm{WACC} = \left(\frac{D}{D+E} i^D (1-\tau) + \frac{E}{D+E} i^E\right)$ where i^D is cost of debt, i^E is cost of equity, *D* is debt finance, *E* is equity finance, and τ is the tax rate.

2 From Hall and Jorgenson (1968) p.394 equation 7, under straight-line depreciation $z = \frac{1}{rT}(1-e^{-rT})$ where r is the discount rate and T is the life of the asset in years.

To put this in the context of the national accounts and derive our estimate of economy-wide rents, write

$$R_t = rK$$

Where *K* is the total stock of net (depreciated) fixed capital assets and *r* is the required rate of return on those assets to deliver a flow of gross surplus in the current year that is consistent with investor expectations at the time each past purchase and installation of a fixed asset was undertaken.

Gross Domestic Income (equal to GDP at factor cost) is the sum of factor incomes paid out and at the same time the value added in production. So

$$Y_t = W_t + r_t K_t + \pi = GO\text{-}IC \qquad (2)$$

Where

W_t is total compensation of employees (payments to labour)

π is the dollar amount of excess surplus

GO is gross output

IC is intermediate consumption

Thus the national-accounts item "gross operating surplus and mixed income" is decomposed between required return to capital investment and other surplus, provisionally classed as "Barkai rent".

3. Barkai-rent by industry

Statistics NZ produces and publishes economy-wide total figures for GDP, GFCF, surplus, and compensation of employees broken down between "market" and "nonmarket" sectors, on the basis of whether outputs are sold in recognised markets or supplied in some other way on a not-for-profit basis. Non-market industries are defined as (Statistics New Zealand 2014 p.20) "industries that do not primarily sell what they produce". They have zero net operating surplus (so that their gross operating surplus is entirely depreciation).

Data were not hitherto available for the industry breakdown of market-sector-only operating surplus, gross fixed capital formation, and compensation of employees. In response to a request, Statistics NZ has provided us with the first two of these at ANZSIC-06 level, and we have used those figures to produce preliminary estimates of factor-cost market GDP by industry since 1972[3]. By linking to pre-1972 data from Philpott (1994a and 1994b), Gillion and Frankel (1967), Official Yearbooks, and early national accounts covering the years 1950-56, and adjusting for apparent under-reporting of some sectors in the last two sources, we have

[3] As the request to Statistics NZ did not include compensation of employees, we have assumed that in each industry the ratio of market sector to total operating surplus applied also to compensation of employees, and we have estimated "other services" figures as residuals from the market-sector totals.

been able to extend the 1950-2021 calculations of Figures 1 and 2 above to the market sectors of nine industries:

- Agriculture, forestry and fishing (ANZSIC code AA)
- Mining and quarrying (ANZSIC code BB)
- Manufacturing (ANZSIC code CC)
- Electricity, gas, water and waste services (ANZSIC code DD)
- Construction (ANZSIC code EE)
- Transport and communications (ANZSIC codes II and JJ)
- Wholesale and retail trade (which we refer to as “trade”), accommodation and food services (ANZSIC codes FF and GH)
- Finance, insurance, real estate and business services (ANZSIC codes KK, LL and MN)
- Education, health, arts services (ANZSIC codes QQ, RS, OO and PP)

The results of applying the Barkai model to those nine industry groups are set out in Figures 3-11. All refer only to the market sectors of the industry groups. These results are work in progress and need to be treated with caution at this stage.

Figure 3: Agriculture, forestry and fishing required return and Barkai rent, 1950-2021

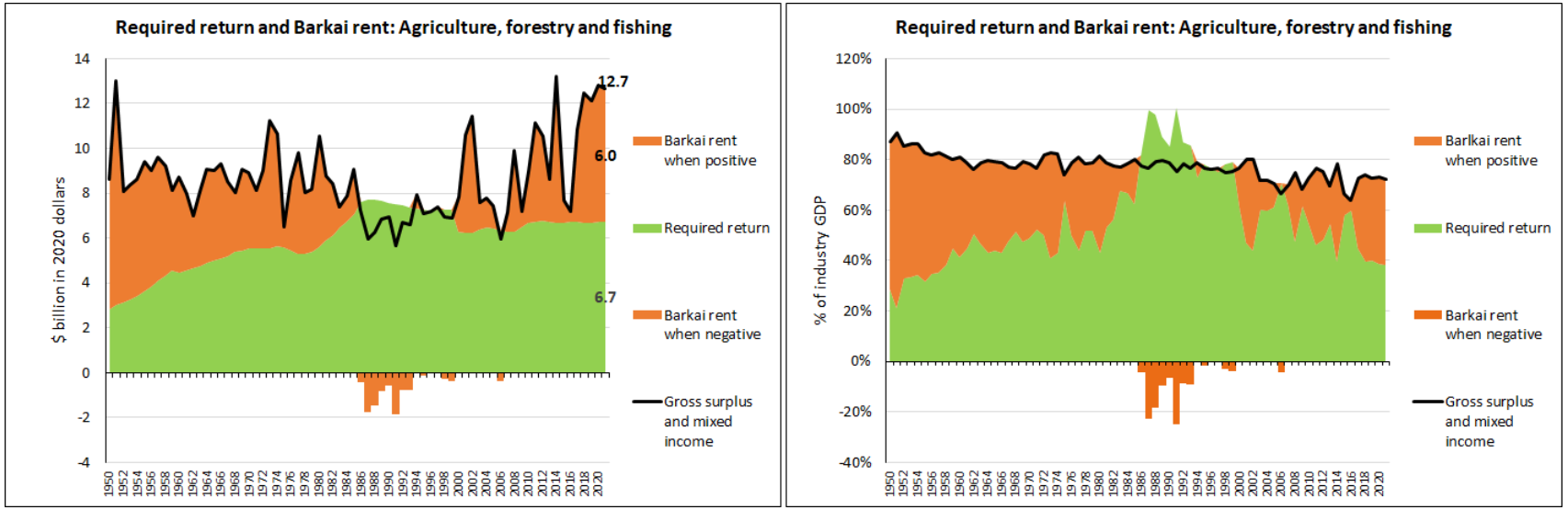


Figure 4: Mining and quarrying required return and Barkai rent, 1950-2021

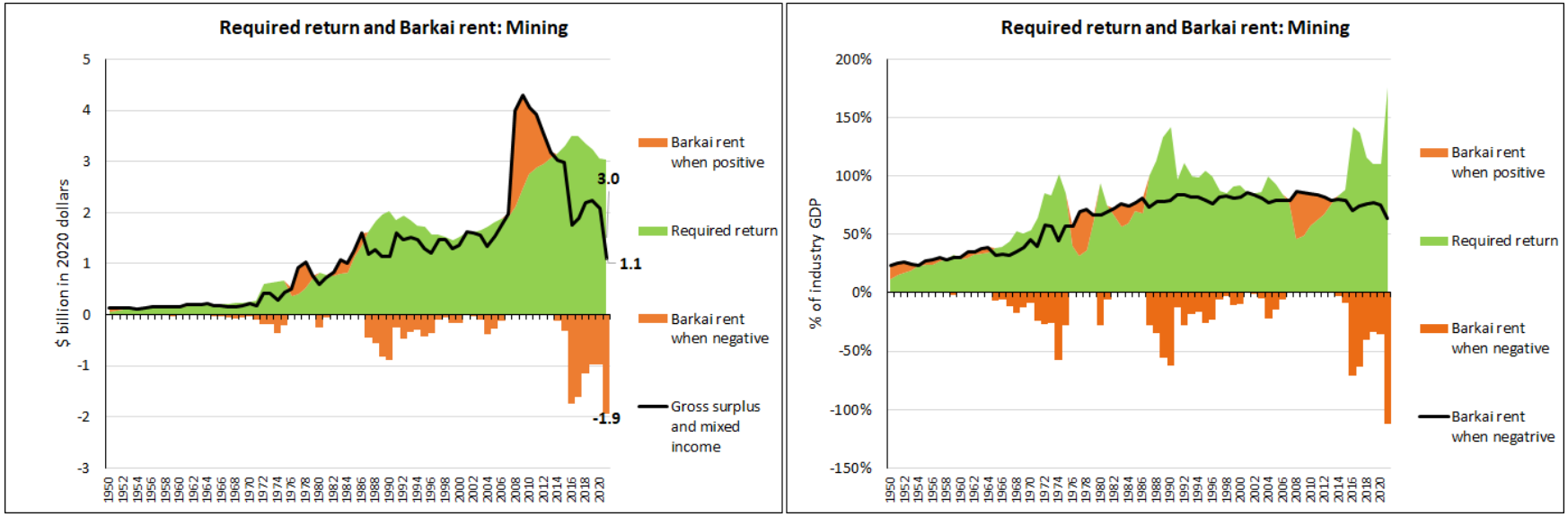


Figure 5: Manufacturing required return and other surplus, 1950-2021

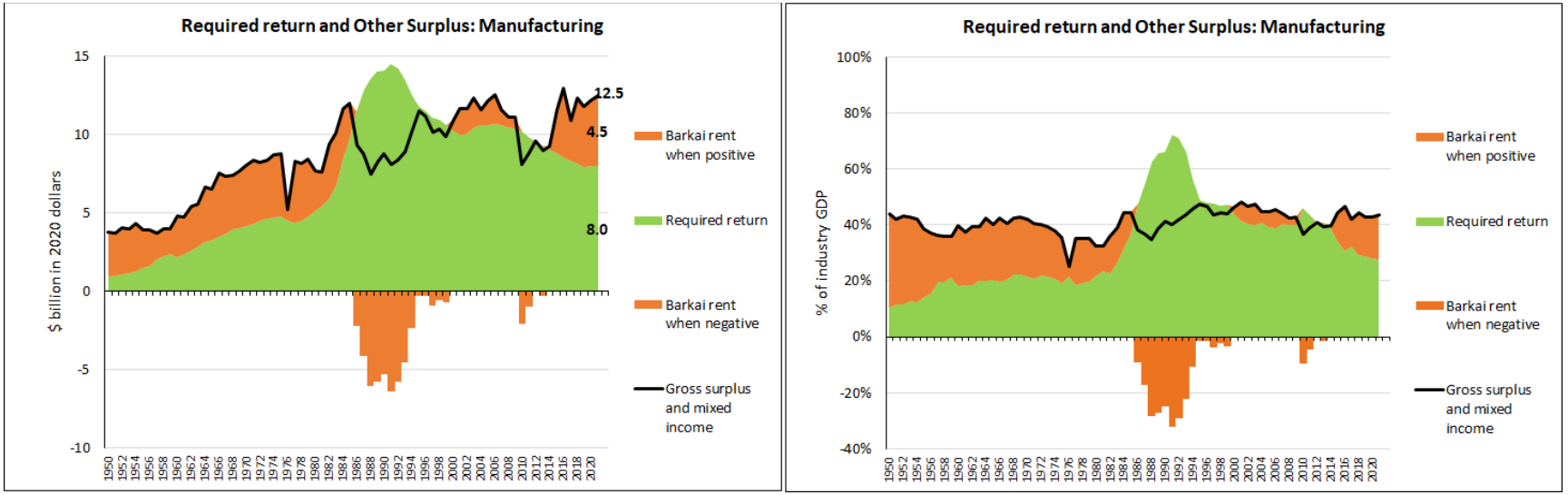


Figure 6: Electricity, gas, water and waste services

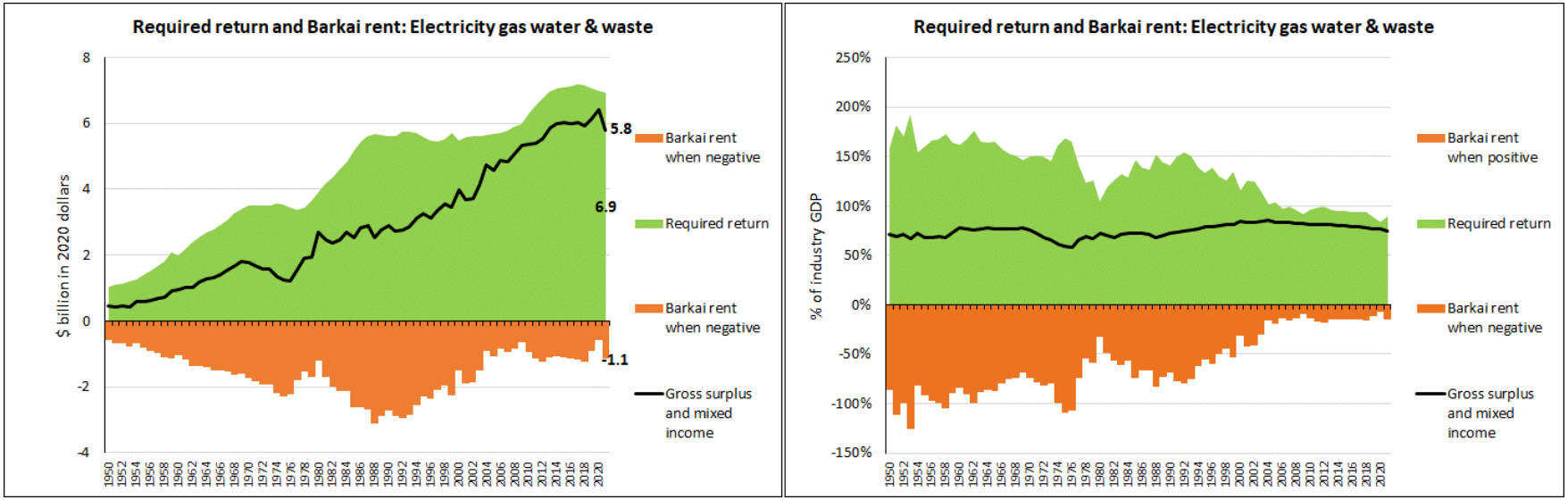


Figure 7: Construction

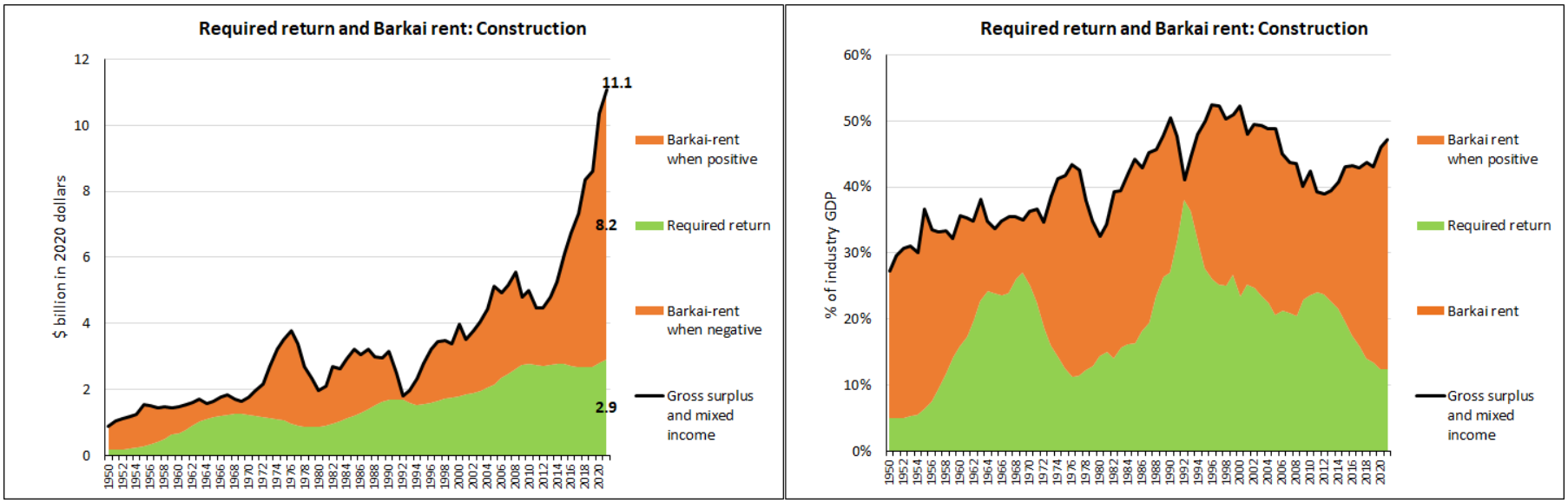


Figure 8: Transport and communications

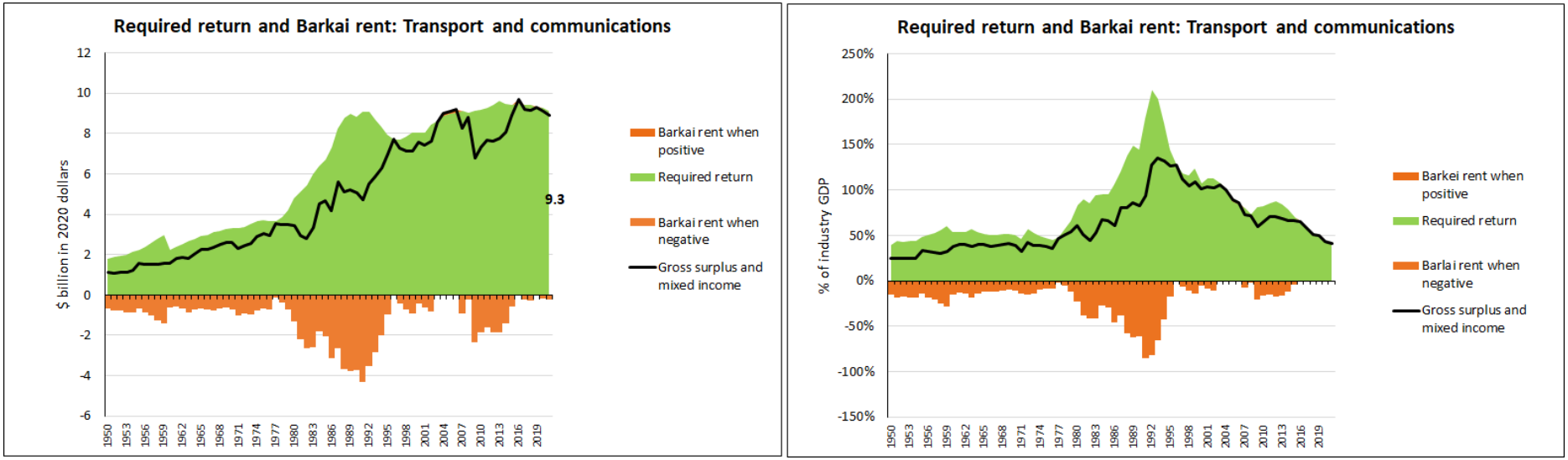


Figure 9: Trade, restaurants and hotels

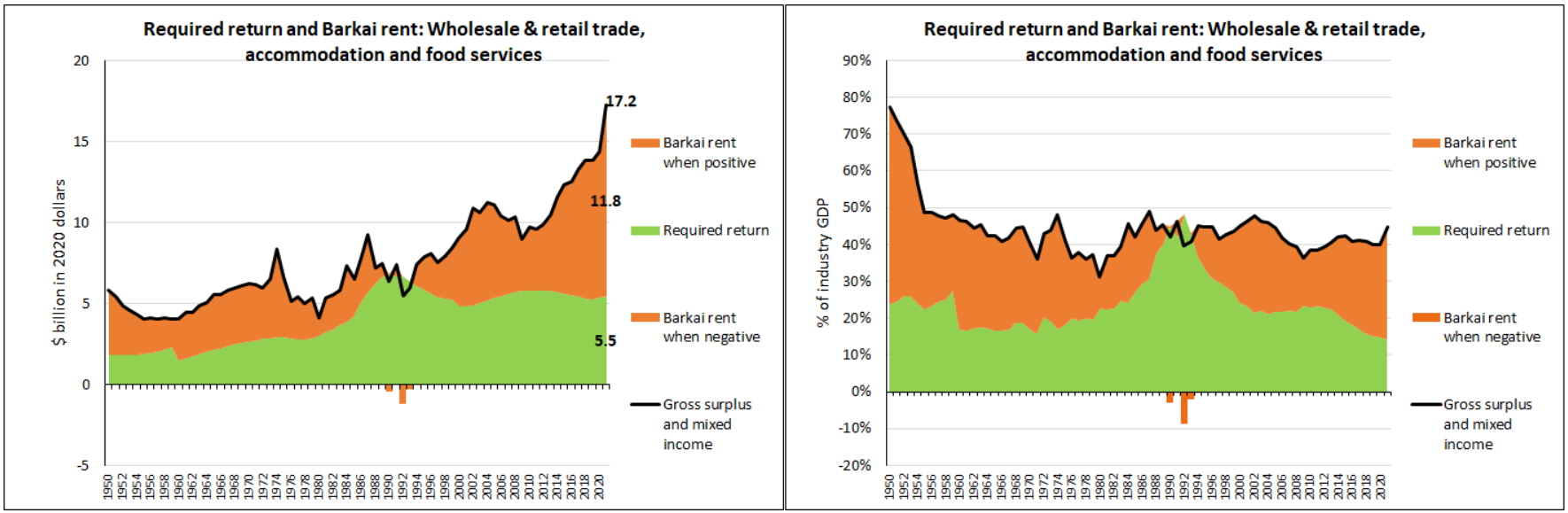


Figure 10: Finance, insurance, real estate and business services

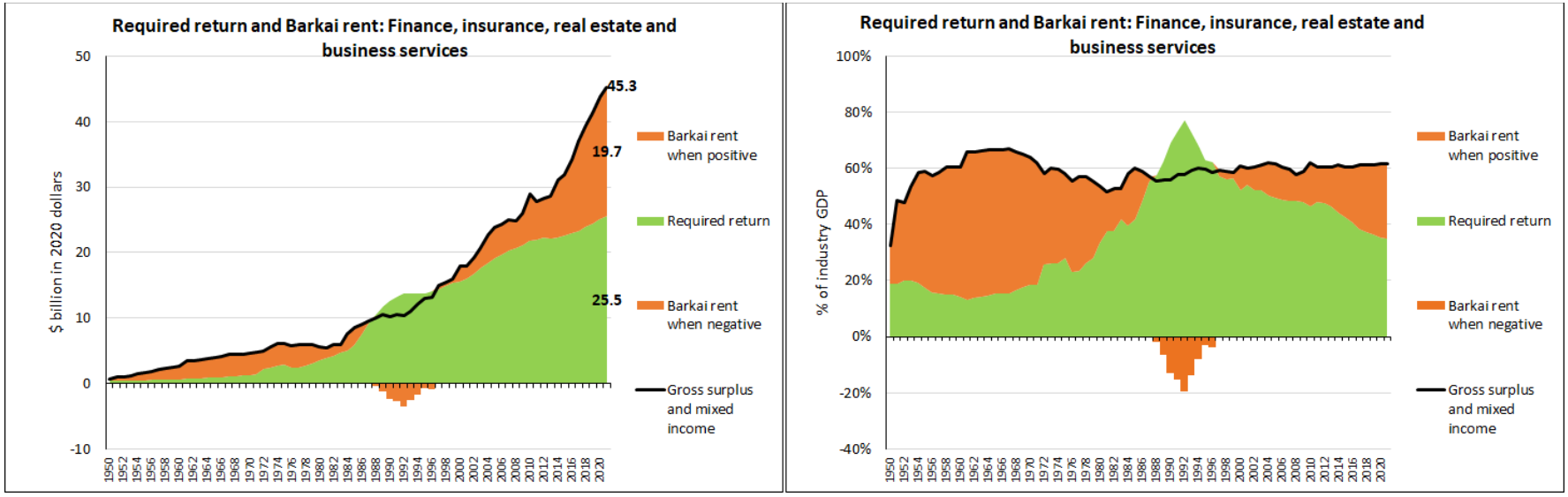
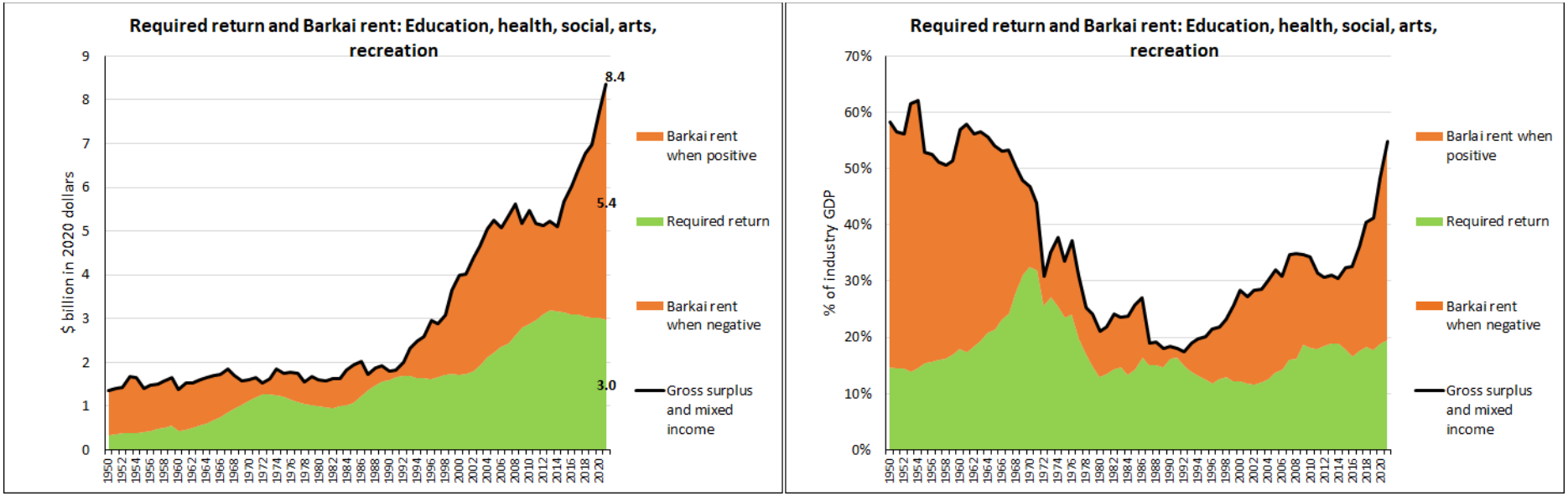


Figure 11: Education, health, arts services



The industry distribution of estimated Barkai-rents is shown in Figures 12 and 13. In the early 1950s - the period of the Korean War wool boom in a pastoral export economy, around 40% of GDP accrued as Barkai-rent, with half of this accounted for by agriculture. By the late 1960s the Barkai-rent share had fallen to 20% of GDP with manufacturing, trade (wholesale and retail trade) accommodation and food services, and finance accounting for around three-quarter of this. Throughout this period prior to the 1980s the utility sectors – electricity, gas, water, waste services, transport and communications – operated with negative Barkai-rents, being dominated by government-owned and operated producers supplying the mass of the population with basic services on a non-profit basis.

A surprising feature of Figures 6 and 8 is that although a considerable period of corporatisation and privatisation has moved large parts of these sectors into conspicuous profitability associated with asset revaluations and large dividends to shareholders, they do not emerge with positive Barkai-rents. However they do mix together contrasting histories; for example in transport and communications, telecommunications has fared well in recent decades whereas transport and news media have not. As long-lived legacy assets are gradually depreciated by the Barkai model, both these industries have moved steadily towards positive Barkai rents.

The 1980s brought a general squeeze on Barkai-rents, with the heaviest burden falling on the tradable-goods-producing sectors manufacturing and agriculture. The most resilient sector in the face of this squeeze was FIRE (finance, insurance, real estate and business services) with business services coming through almost unscathed.

In the three decades after 1990 the total Barkai-rent share ballooned from 2% in 1990 to 21% of GDP by 2021 on a rapidly rising path. The increase occurred in two clear phases. From 1990 to 2002 the Barkai-rent claim rose from 2% to 13% of GDP before stabilising over the following decade. Then a second upward surge began in 2014. It might be suggested that the Clark Labour Government of 2000-2008 coincided with the period of stability while the National regimes of 1990-1999 and 2009-2017 were periods of acceleration; but no matching policy-related slowdown is observed for the years of the Ardern-Hipkins Labour Government since 2018.

The rise in the Barkai-rent share of GDP following the neoliberal policy revolution of 1984-94 obviously runs parallel with the increase in income and wealth inequality and the onset of wage repression following the Employment Contract Act 1992, indicating that the roots of inequality have lain not so much in productive investment as in the acquisition and exercise of valuable property rights and bargaining power in a deregulated policy environment.

The tradable-goods sectors manufacturing and agriculture together took the largest share of Barkai-rents in mid-century (see Table 5), but the dominant sectors in term of Barkai-rents since 2000 have been FIRE (8% of GDP and $20 billion in 2021, with business services outranking finance and insurance) and trade/restaurants/hotels (5% of GDP and $12 billion in 2021). Construction and market-based health services also feature strongly.

Having assembled the data and derived these results, our attention now turns to incorporating into the analysis some estimates of labour income attributable to the self employed, inclusion of which arguably means the above Barkai-rent figures overstate the extent of actual rents accruing to asset owners

Figure 12: $billion at 2020 prices

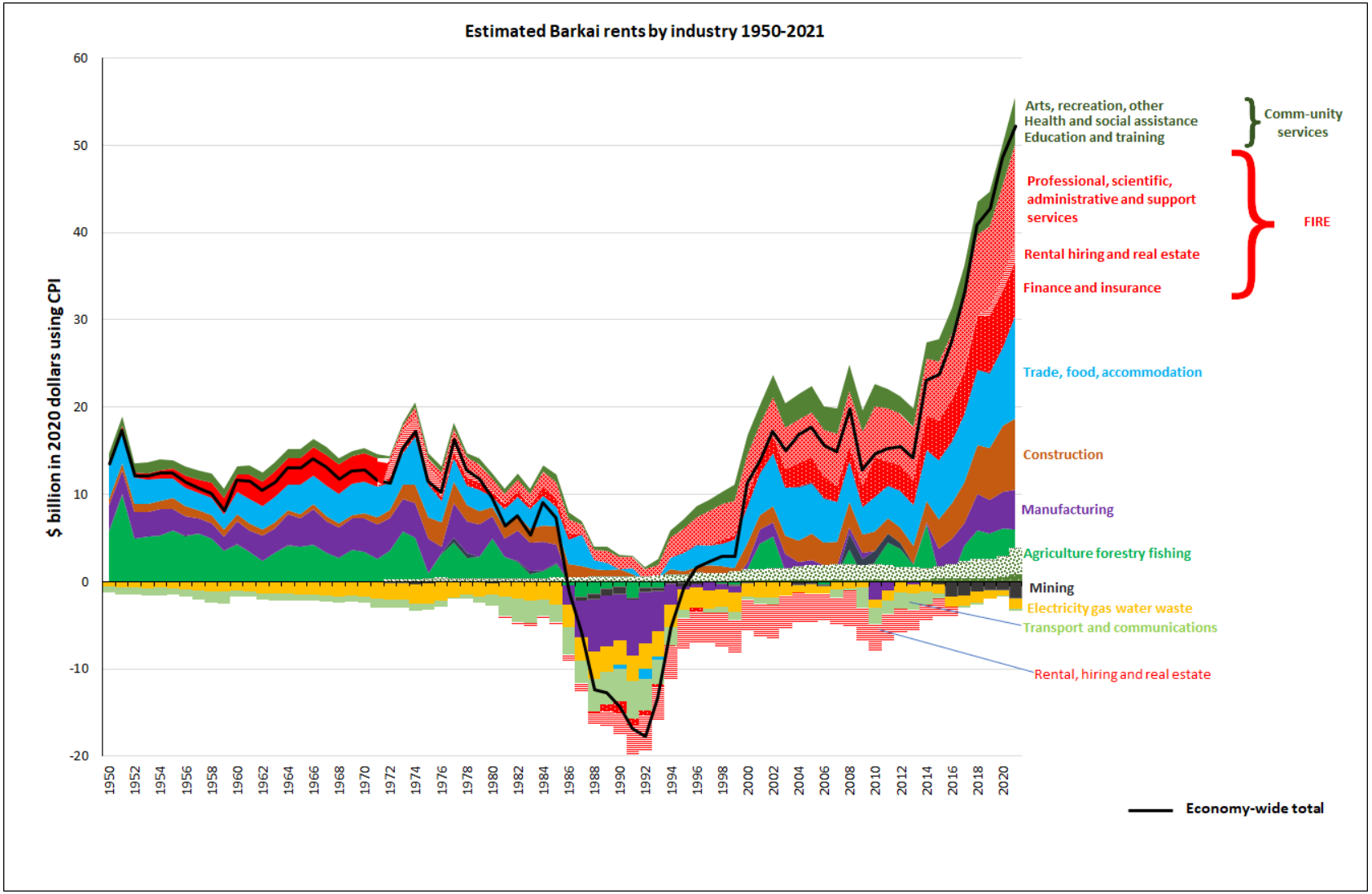
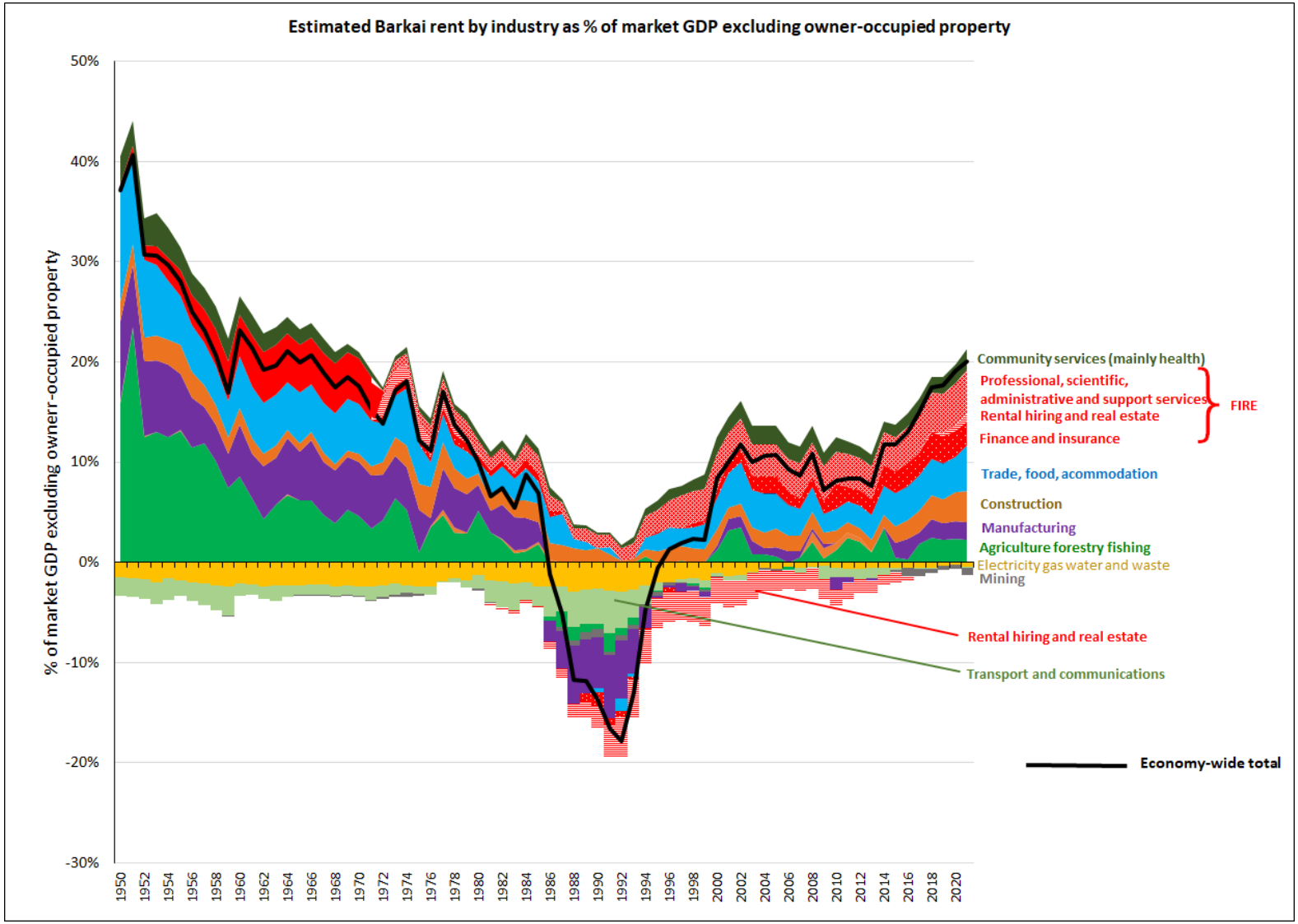


Figure 13: percent of market GDP excluding owner-occupied property



4. Decomposing self-employed "mixed income"

As noted above, the Barkai measure of "rent" reported in section 3 includes labour income that ought to be attributed to the self-employed, and is correspondingly overstated. In this section we consider a range of possible values for self-employed labour income and subtract this from our Barkai-rent calculations.

The self-employed have accounted for between 10% and 20% of the total labour force since 1939, with quite wide swings (see Table 1 and Figure 14, which should be regarded as estimates before 1987). Their income, classed as "mixed income" (a mix of labour income, return on capital, and rent) is included in the national accounts measure "gross operating surplus and mixed income". Table 2 and Figure 15 show our estimates for the breakdown over the period 1939-2021.

Figure 14[4]

[4] Smoothed by 5-year rolling averages (geometric means) centred on year identified.

Figure 15

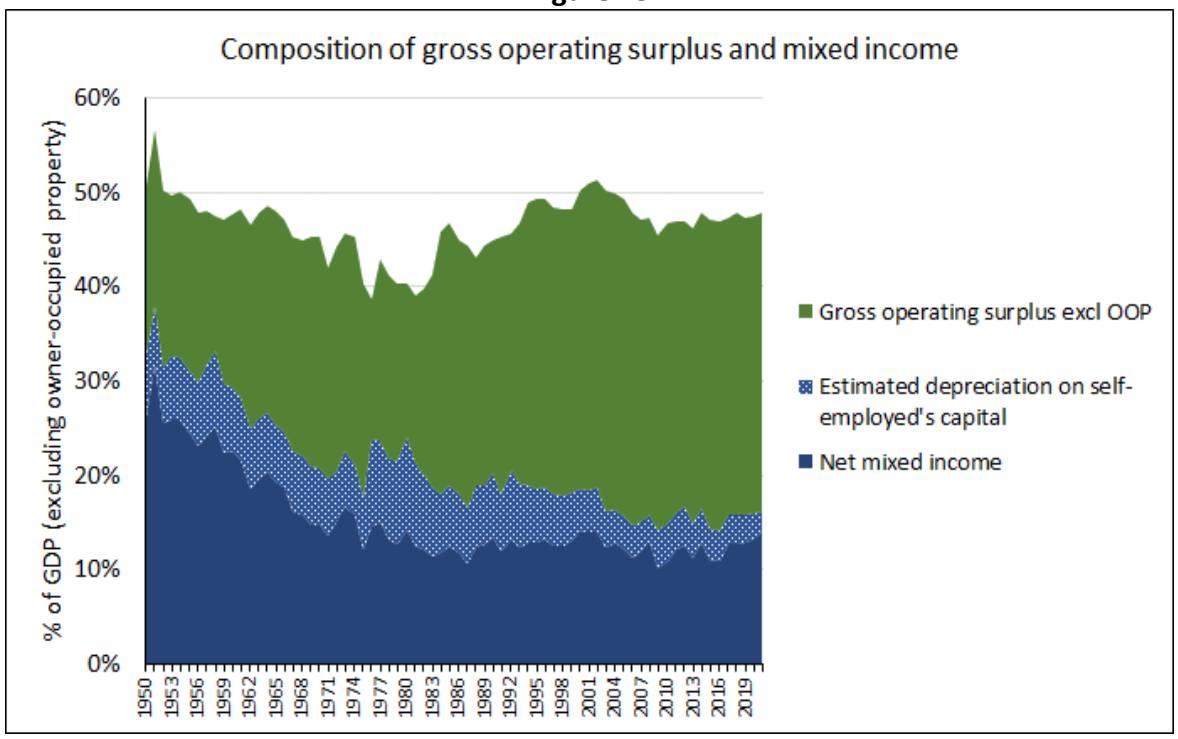


Figure 15 portrays an economy that following the Second World War was dominated by the self-employed[5] who received two-thirds of the economy's total gross operating surplus and mixed income; but by the start of the 1970s gross mixed income had fallen from 32% of GDP in 1950 (peaking at 38% in 1951 in the Korean War boom) to 20%, while corporate operating surplus had increased from 18% to 24% of GDP. Subsequently for the three decades since 1990, mixed income has consistently accounted for under 20% of GDP and around one-third of total "gross surplus and mixed income". If, for example, half of mixed income is actually labour income, then one-sixth of the national accounts' gross surplus measure would need to be reclassified as labour income, with a consequent reduction from our estimate of Barkai rent.

"Mixed income" is described by Statistics NZ as "accounting profit before direct taxes, dividends, interest paid, and bad debts are deducted, and before interest and dividends received are added … [f]or unincorporated enterprises" (Statistics New Zealand, 2014, p.17). Statistics NZ also add "Compensation of working proprietors within businesses with corporate structures" to the surplus from unincorporated businesses to give their full measure of mixed income (Statistics New Zealand, 2022, p.23, 27). The national accounts record "gross mixed income" for two categories of businesses: financial (SNEA.S2NB0300S200C0; Infoshare Table SNE200AA) and non-financial (SNEA.S1NB0300MS100C0, Infoshare Table SNE182AA), with the latter broken down into corporate (SNEA.S2NB0300S111C9, Infoshare Table SNE195AA) and non-corporate (SNEA.S2NB0300S121C0, Infoshare Table SNE196AA). These series, however, run only from 1999 to 2019.

[5] Descriptions of four types of self-employed - managers, salaried managers, worker-managers, and manager-experts, are in Franklin (1978) pp.65-66.

With depreciation excluded but some other categories of property income added[6], mixed income appears as "household entrepreneurial income" in the Household Income and Outlay Account. Official figures for this, divided between farm and non-farm income, are available for years from 1987 to 2021, and we have assembled earlier series for net income of the self-employed covering the years 1939-1986[7], producing a series that dovetails well with the SNA data. Table 3 sets out the available figures for net and gross mixed income along with corporate gross operating surplus.

Both "gross mixed income" and "net entrepreneurial income" are amalgams of returns to self-employed proprietors' labour and capital. To apportion the net income figures between these two involves some essentially arbitrary procedures. In order to explore the potential impact of imputing labour income to the self-employed we experiment with four scenarios:

1. Scenario 1: in each industry, as described by Rosenberg (2017, p.4), we pay the self employed the going industry wage received by employees, capped by net mixed income.
2. To allow for evidence that self-employed income is under-reported by about 20% (Cabral et al 2021) we modify scenario 1 by adding to the adjusted surplus an allowance for under-reporting calculated as 25% of the industry gross mixed income.
3. Scenario 3 assumes that gross mixed income is divided between return to capital and return to labour in the same proportions as apply to each industry. The formula is "Net mixed income multiplied by Compensation of Employees divided by (Net Domestic Income less net mixed income less Net Owner-Occupied Property Operation)".
4. Scenario 4 adjusts scenario 3 in the same was as in scenario 2, by adding back into industry surplus 25% of gross mixed income.

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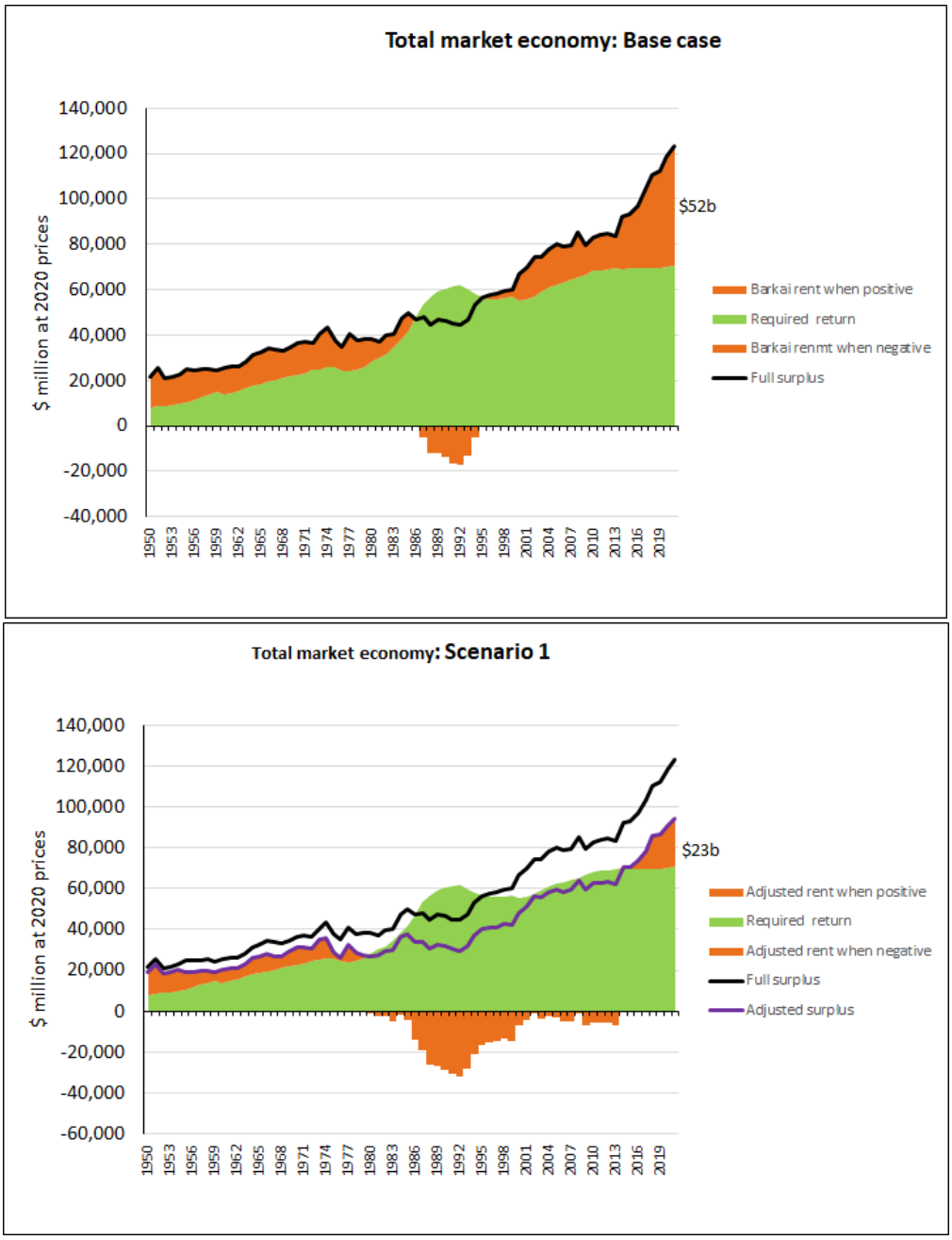
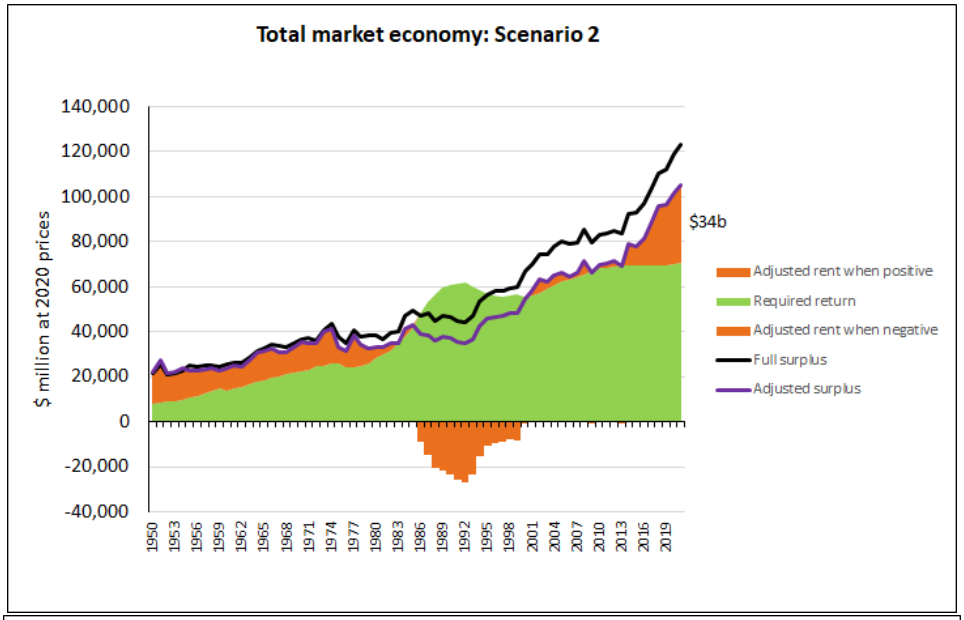
6 SNZ define entrepreneurial income as "Entrepreneurial income consists of the operating surplus, plus property income receivable, less property income payable, of unincorporated businesses (ie businesses owned and operated by individuals or partnerships). We also include the salaries and wages of working proprietors of private companies – which we treat as operating surplus in the New Zealand national accounts because they are more in the nature of profit withdrawals than payments to paid employees in return for their labour." https://datainfoplus.stats.govt.nz/item/example.org/1639b041-d4c8-43e9-9de9-9599b0a1fd62

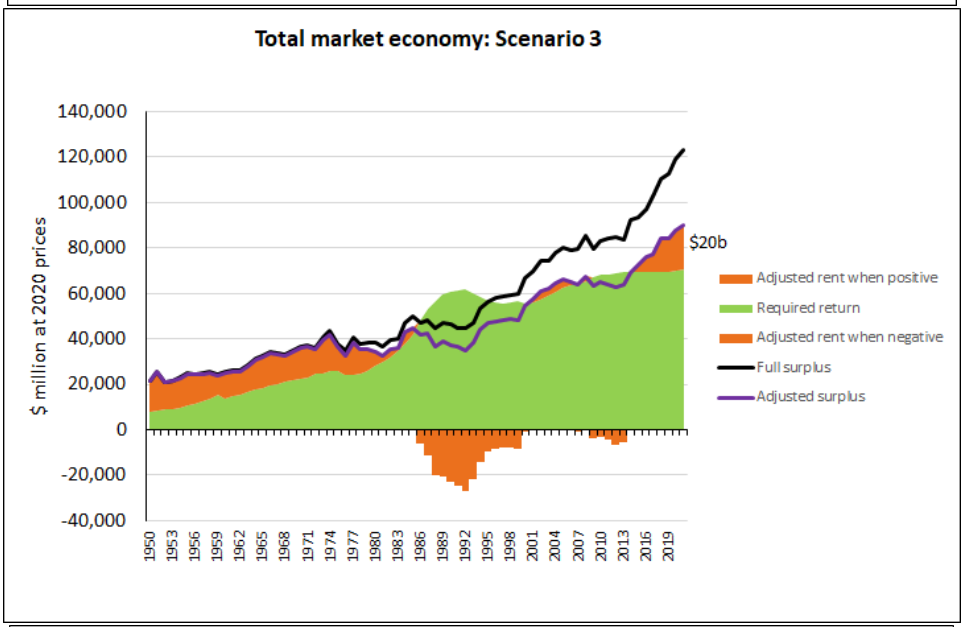
7 This whole-economy series is compiled by chain linking the following overlapping series back from the most recent series: (1) From 1939 to 1959, the series ONAA.SAC (Other Personal Income: Total) from discontinued Infoshare table ONA001AA National Accounts ONA Tables A1-A8. (2) From 1960 to 1972, the sum of the three series Other Persons Income, Farm Income (Unincorporated), and Compensation of Working Proprietors from Grindell (1981) p.19, Table 7 Household Income and Outlay Account (part of the first set of SNA accounts for New Zealand). (3) From 1972 to 1986, the sum of Farm and Non-farm entrepreneurial Income to households, discontinued series SNBA.S1BC and SNBA.S1BD from Infoshare table SNB028AA.(4) from 1987 to the present, Total entrepreneurial income, series SNEA.S2NB4000S500C1 from Infoshare table SNE205AA.

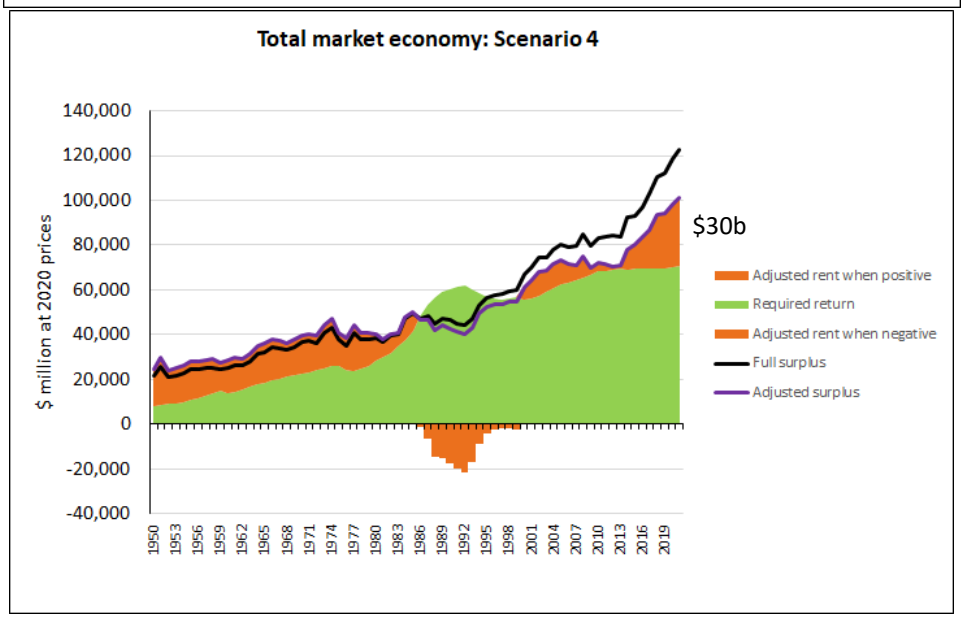
Table 4 shows these calculations for the market economy as a whole. Figure 16 shows the results of imposing the four scenarios on the total market economy. In all cases the imputation of labour income to the self employed produces a significant downward shift of the gross-surplus line, and hence a squeeze on the remaining rent component.

Figure 16: Base case and four scenarios for adjusting Barkai-rent to allow for labour payments to the self employed




Total market economy: Scenario 2
$ million at 2020 prices
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
-20,000
-40,000
1950 1953 1956 1959 1962 1965 1968 1971 1974 1977 1980 1983 1986 1989 1992 1995 1998 2001 2004 2007 2010 2013 2016 2019
$34b
Adjusted rent when positive
Required return
Adjusted rent when negative
Full surplus
Adjusted surplus


Total market economy: Scenario 3
$ million at 2020 prices
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
-20,000
-40,000
1950 1953 1956 1959 1962 1965 1968 1971 1974 1977 1980 1983 1986 1989 1992 1995 1998 2001 2004 2007 2010 2013 2016 2019
$20b
Adjusted rent when positive
Required return
Adjusted rent when negative
Full surplus
Adjusted surplus

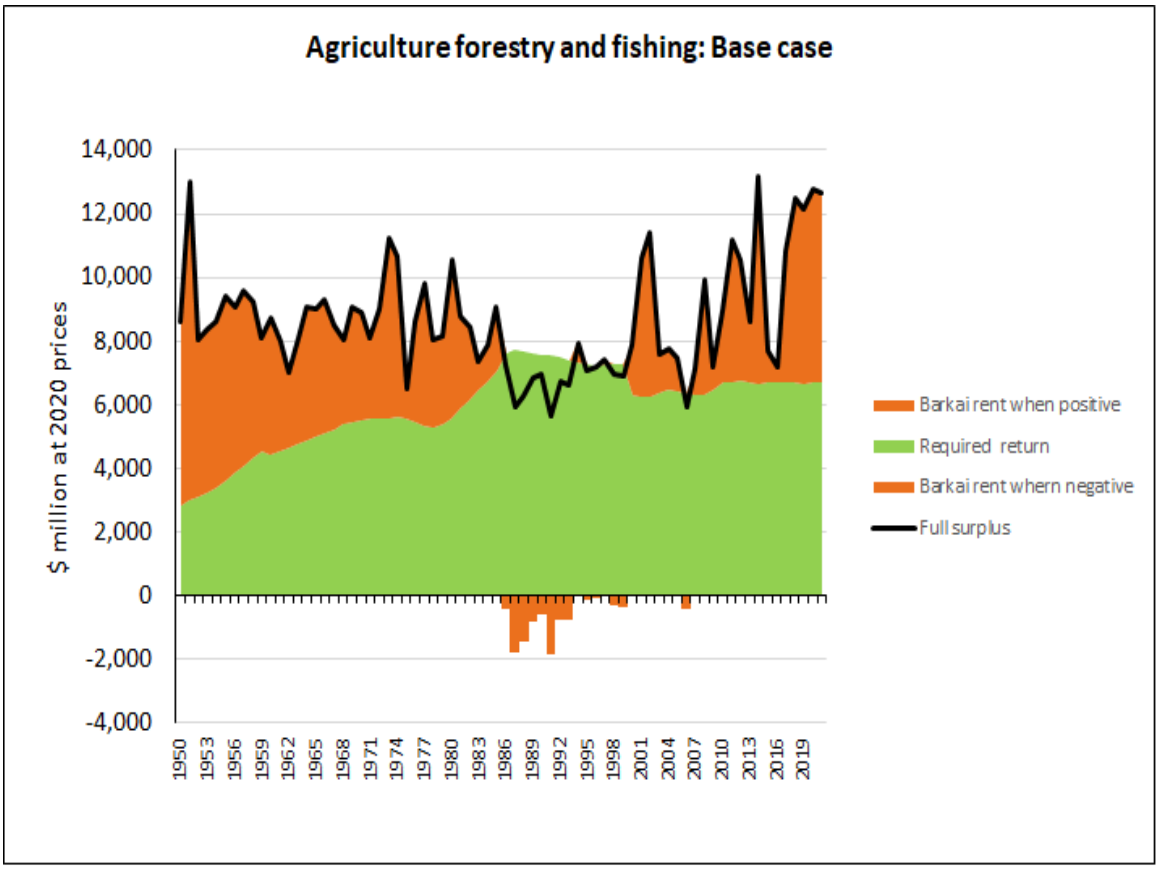

Total market economy: Scenario 4
$ million at 2020 prices
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
-20,000
-40,000
1950 1953 1956 1959 1962 1965 1968 1971 1974 1977 1980 1983 1986 1989 1992 1995 1998 2001 2004 2007 2010 2013 2016 2019
$30b
Adjusted rent when positive
Required return
Adjusted rent when negative
Full surplus
Adjusted surplus

Even the scenario that imputes the greatest income to the labour of the self employed (scenario 3) leaves $20 billion of rent still standing in 2021. Allowing for 20% under-reporting of mixed income (scenario 4) raises that back to $30 billion of Barkai rent net of self-employed labour. To dig deeper, we need to focus in more detail on the industry-level data to see where most of the rents arise. Figures 16-23 show the results by industry for the base case and scenario 1 (most of the other scenarios fall within this range).

The table below shows that the dominant rent sectors in 2021 were agriculture/forestry/fishing (18% of the total), trade/hotels/ restaurants (29%), and finance/real estate/business services (34%).

	Excess of surplus over required return, $ million at 2020 prices			% of total		
	Base case	Scenario 1	Scenario 2	Base case	Scenario 1	Scenario 2
Agriculture forestry and fishing	5,952	3,999	6,252	11%	17%	18%
Mining and quarrying	-1,791	-1,844	-1,832	-3%	-8%	-5%
Manufacturing	4,527	2,400	2,834	9%	10%	8%
Construction	8,158	1,807	3,103	16%	8%	9%
Electricity gas water and waste	-1,131	-1,249	-1,236	-2%	-5%	-4%
Trade restaurants and hotels	11,774	8,960	9,893	22%	38%	29%
Transport and communications	-225	-2,386	-2,042	0%	-10%	-6%
Finance, real estate and business services	19,737	7,403	11,735	38%	32%	34%
Other services	5,373	4,369	5,700	10%	19%	17%
Total	52,384	23,459	34,407	100%	100%	100%

Figure 16


Agriculture forestry and fishing: Base case
$ million at 2020 prices
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
-2,000
-4,000
1950
1953
1956
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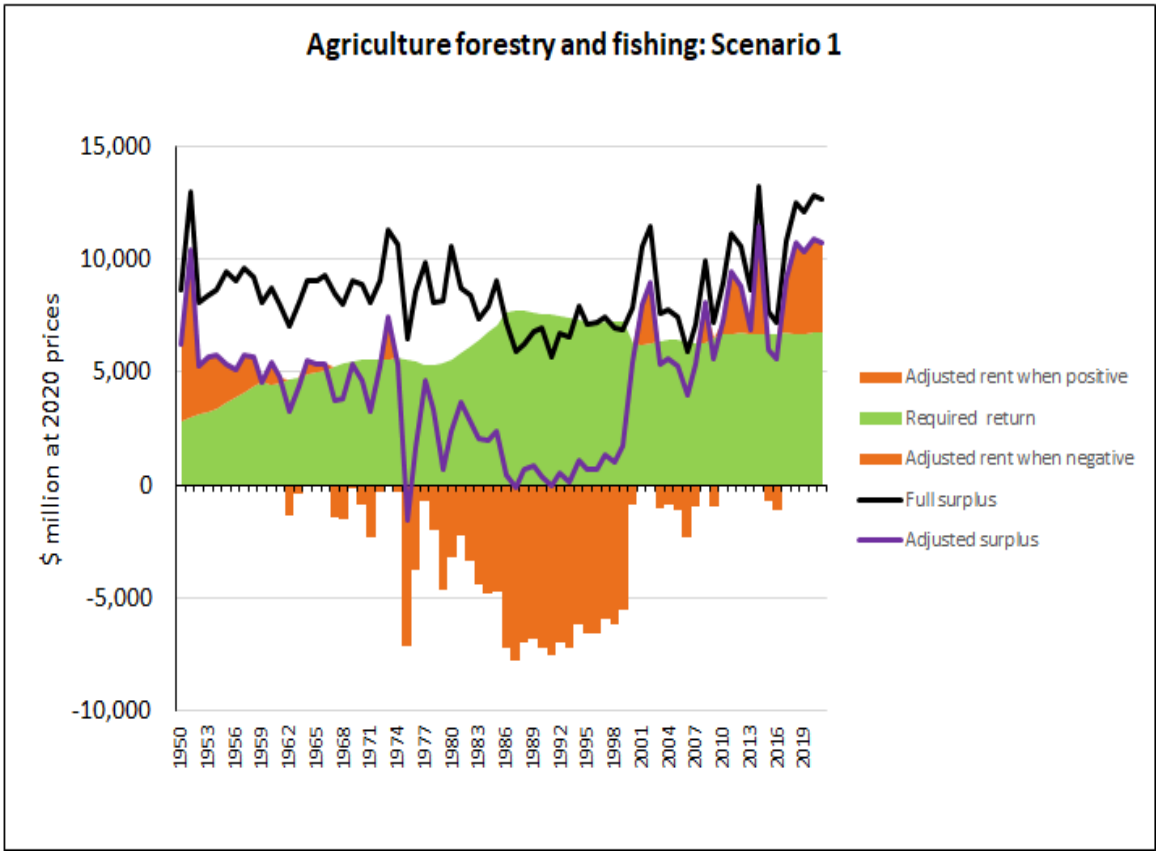
2016
2019
Barkai rent when positive
Required return
Barkai rent whern negative
Full surplus


Agriculture forestry and fishing: Scenario 1
$ million at 2020 prices
15,000
10,000
5,000
0
-5,000
-10,000
1950
1953
1956
1959
1962
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2007
2010
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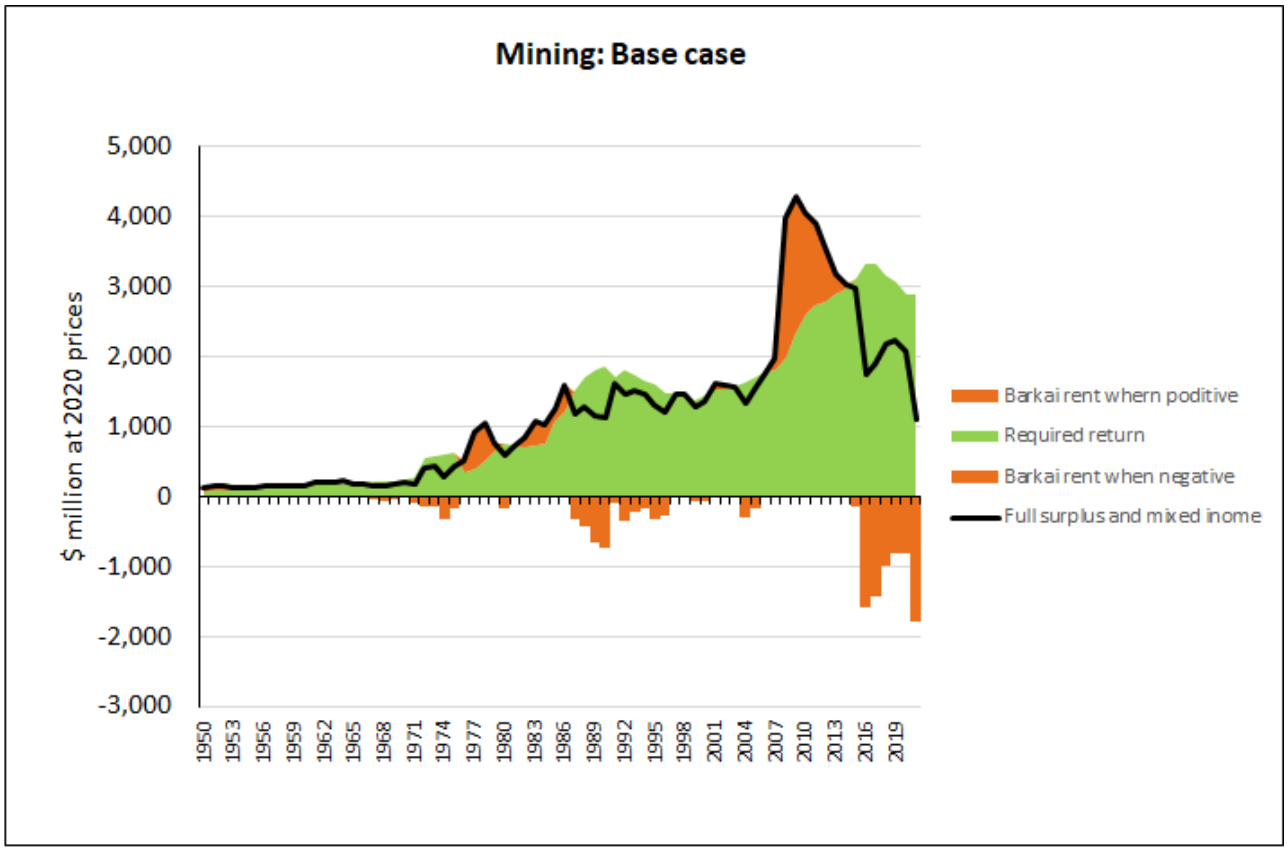
2016
2019
Adjusted rent when positive
Required return
Adjusted rent when negative
Full surplus
Adjusted surplus

Figure 17


Mining: Base case
$ million at 2020 prices
5,000
4,000
3,000
2,000
1,000
0
-1,000
-2,000
-3,000
1950
1953
1956
1959
1962
1965
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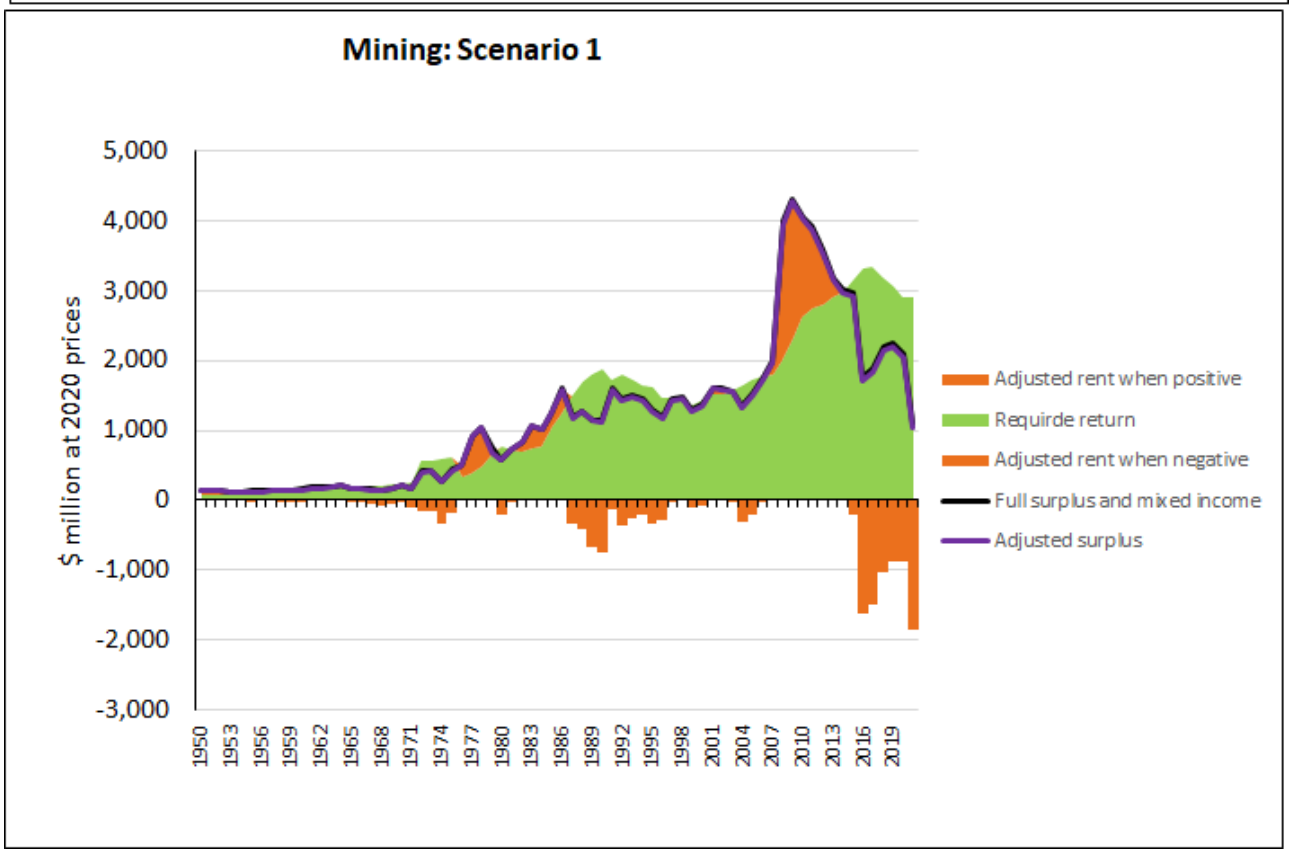
Barkai rent whern poditive
Required return
Barkai rent when negative
Full surplus and mixed inome


Mining: Scenario 1
$ million at 2020 prices
5,000
4,000
3,000
2,000
1,000
0
-1,000
-2,000
-3,000
1950
1953
1956
1959
1962
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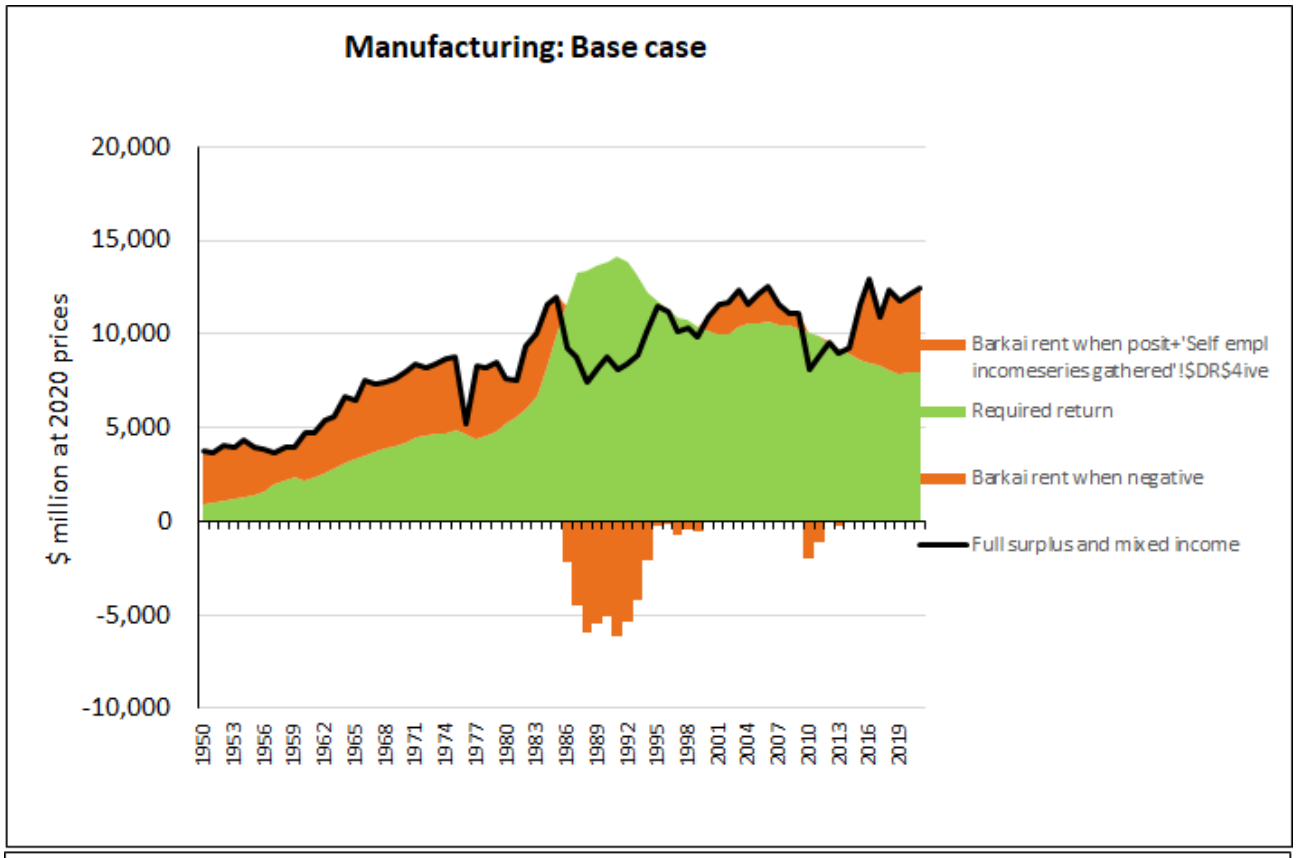
2016
2019
Adjusted rent when positive
Requirde return
Adjusted rent when negative
Full surplus and mixed income
Adjusted surplus

Figure 18


Manufacturing: Base case
$ million at 2020 prices
20,000
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10,000
5,000
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-5,000
-10,000
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1962
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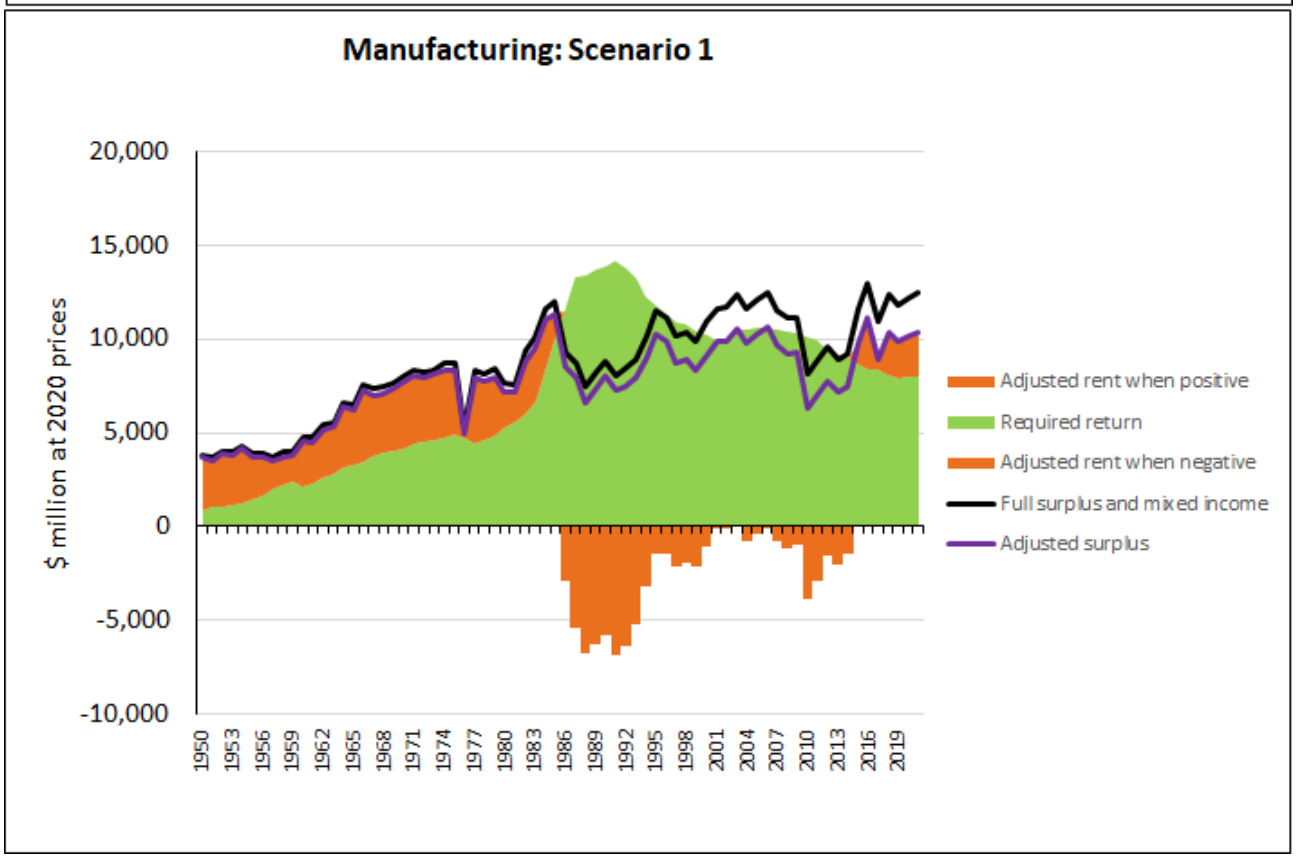
2019
Barkai rent when posit+'Self empl incomeseries gathered'!DR4ive
Required return
Barkai rent when negative
Full surplus and mixed income


Manufacturing: Scenario 1
$ million at 2020 prices
20,000
15,000
10,000
5,000
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-5,000
-10,000
1950
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1956
1959
1962
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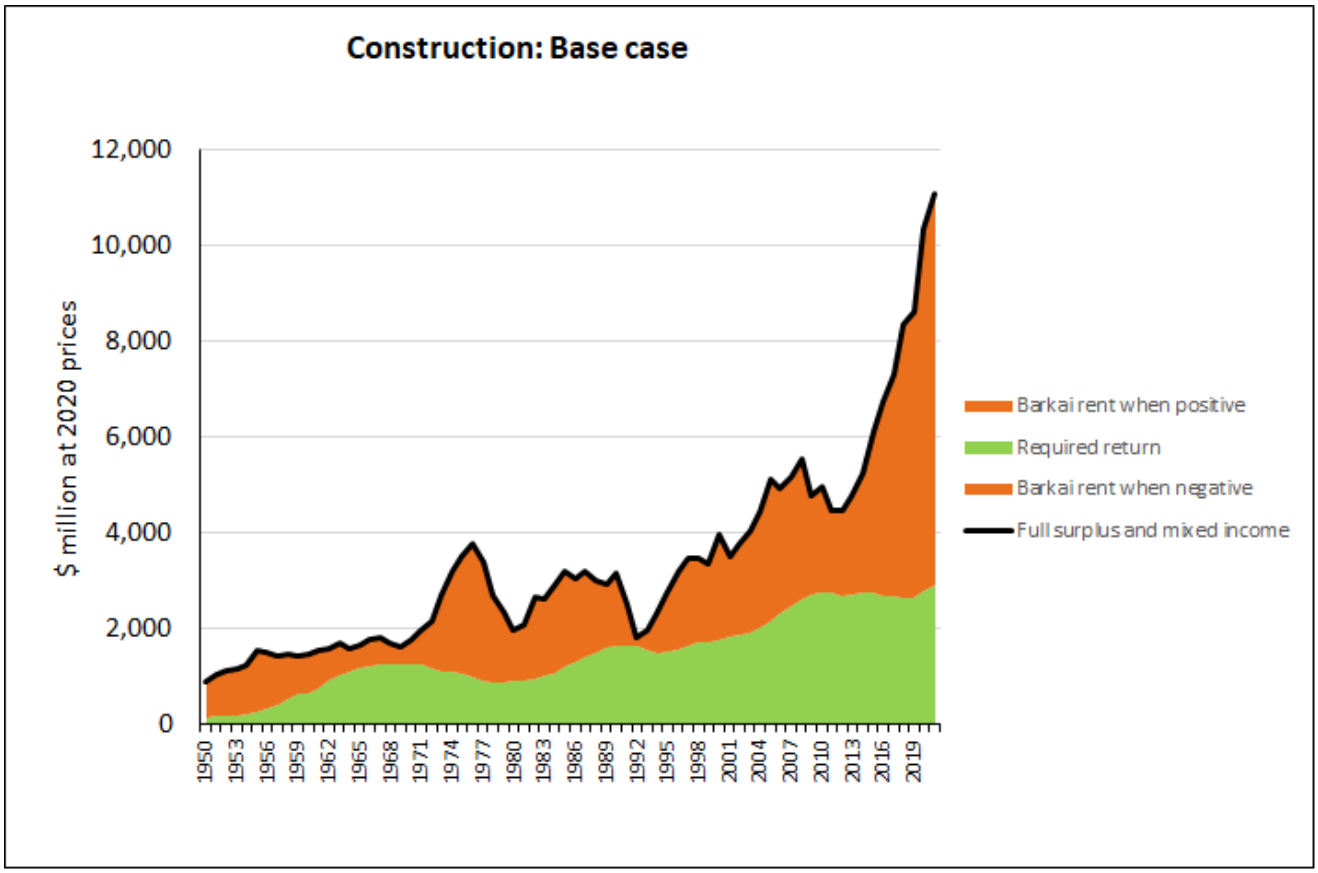
2016
2019
Adjusted rent when positive
Required return
Adjusted rent when negative
Full surplus and mixed income
Adjusted surplus

Figure 19


Construction: Base case
$ million at 2020 prices
12,000
10,000
8,000
6,000
4,000
2,000
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1962
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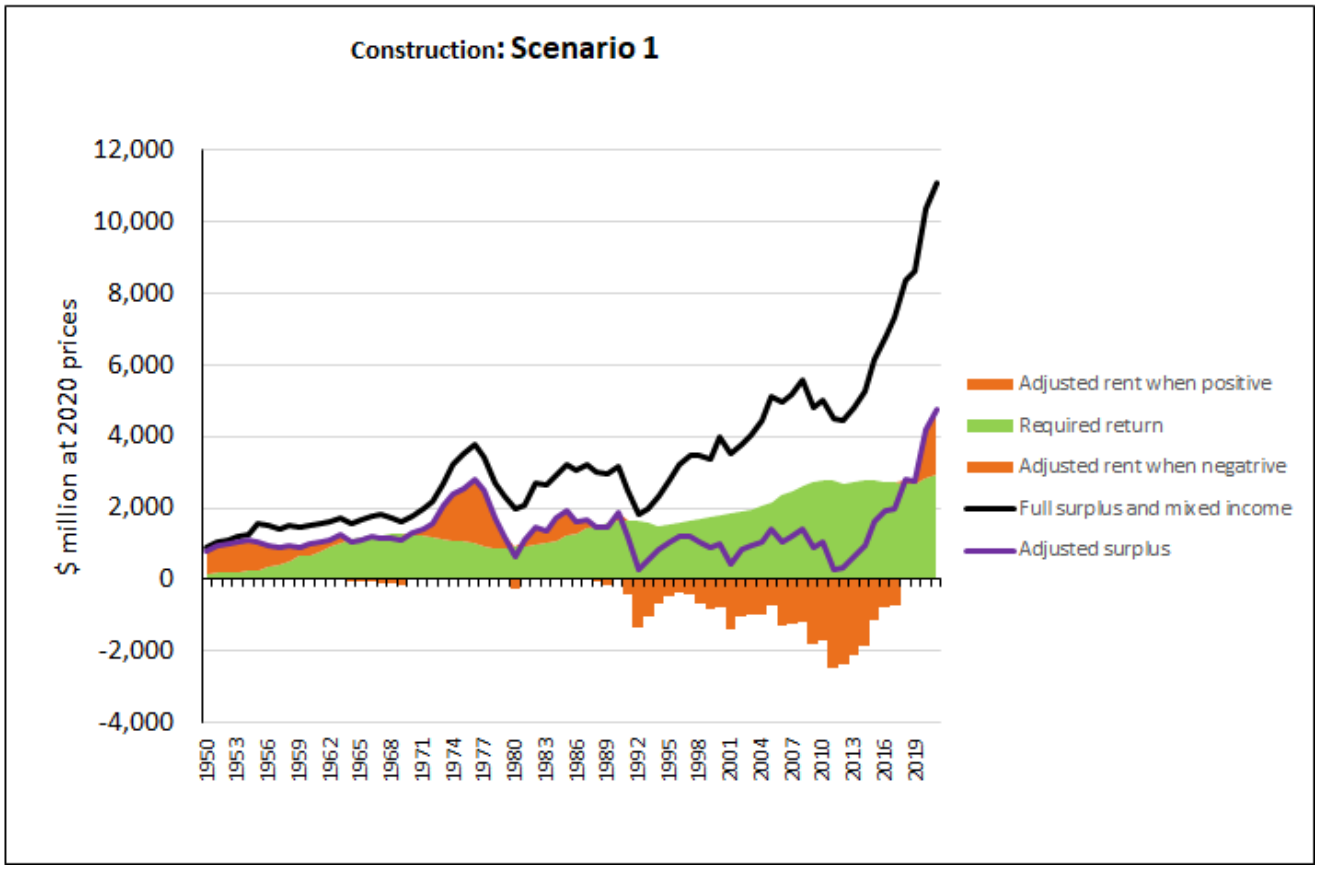
2019
Barkai rent when positive
Required return
Barkai rent when negative
Full surplus and mixed income


Construction: Scenario 1
$ million at 2020 prices
12,000
10,000
8,000
6,000
4,000
2,000
0
-2,000
-4,000
1950
1953
1956
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1962
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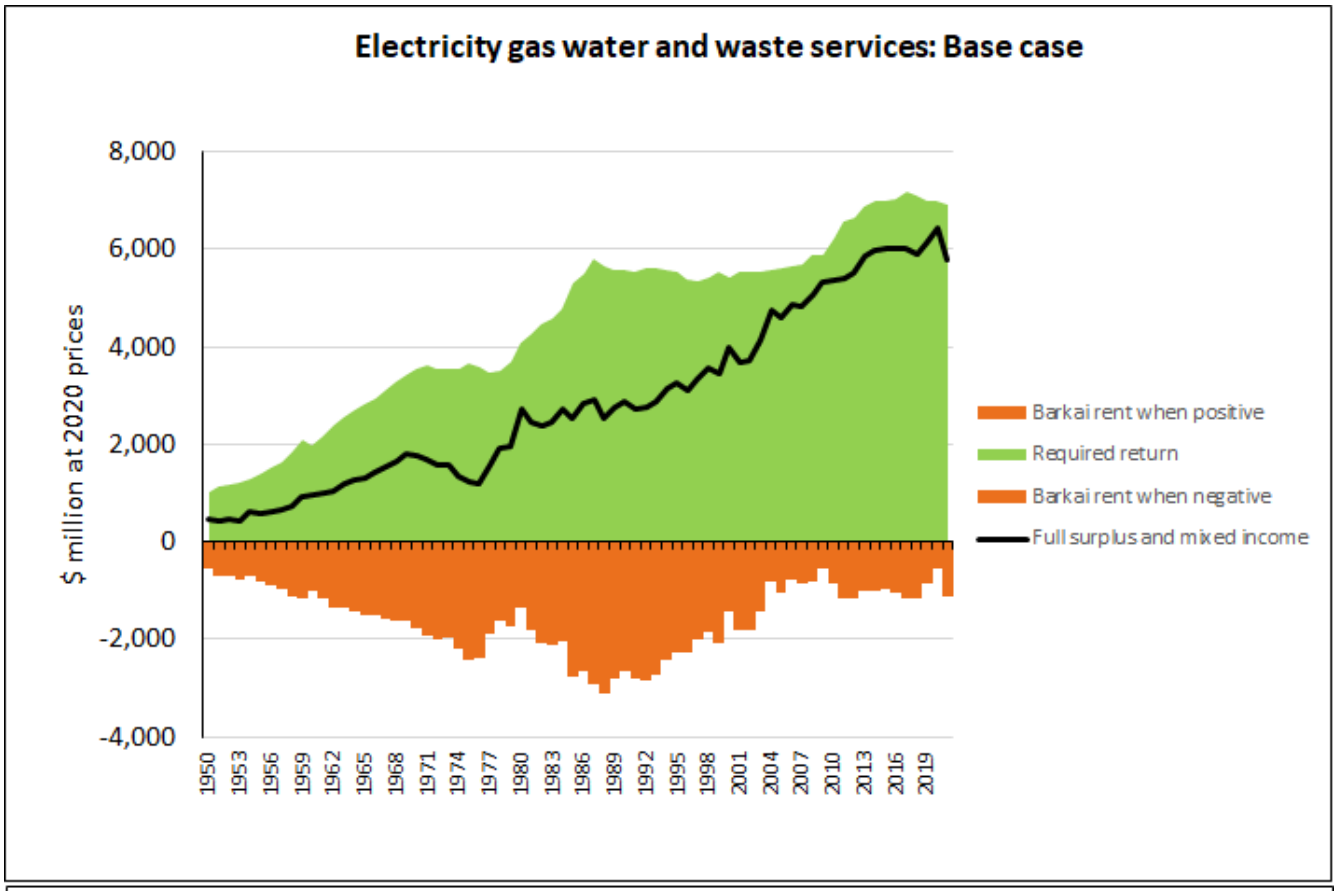
2019
Adjusted rent when positive
Required return
Adjusted rent when negatrive
Full surplus and mixed income
Adjusted surplus

Figure 20


Electricity gas water and waste services: Base case
$ million at 2020 prices
8,000
6,000
4,000
2,000
0
-2,000
-4,000
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1953
1956
1959
1962
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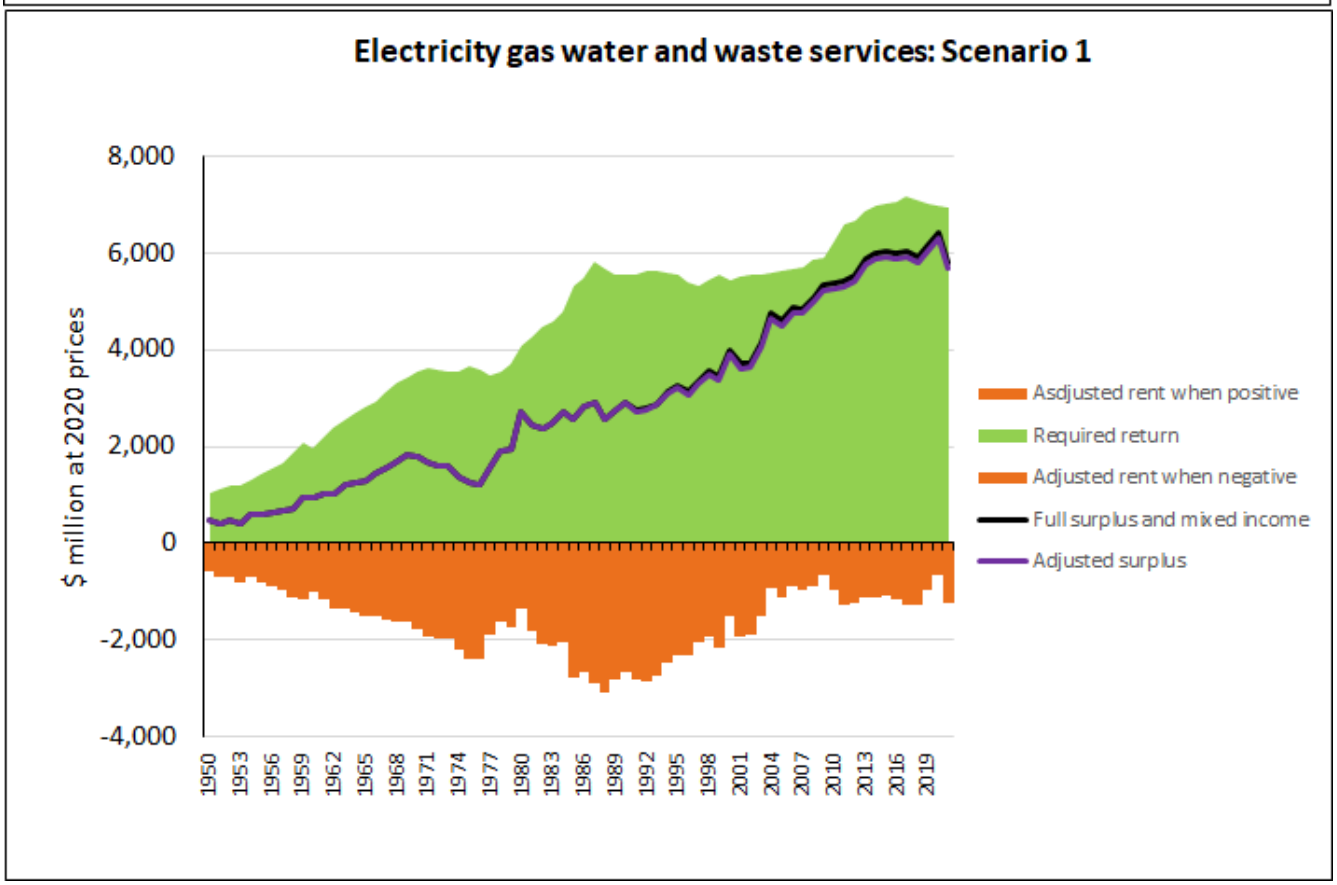
2013
2016
2019
Barkai rent when positive
Required return
Barkai rent when negative
Full surplus and mixed income


Electricity gas water and waste services: Scenario 1
$ million at 2020 prices
8,000
6,000
4,000
2,000
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-2,000
-4,000
1950
1953
1956
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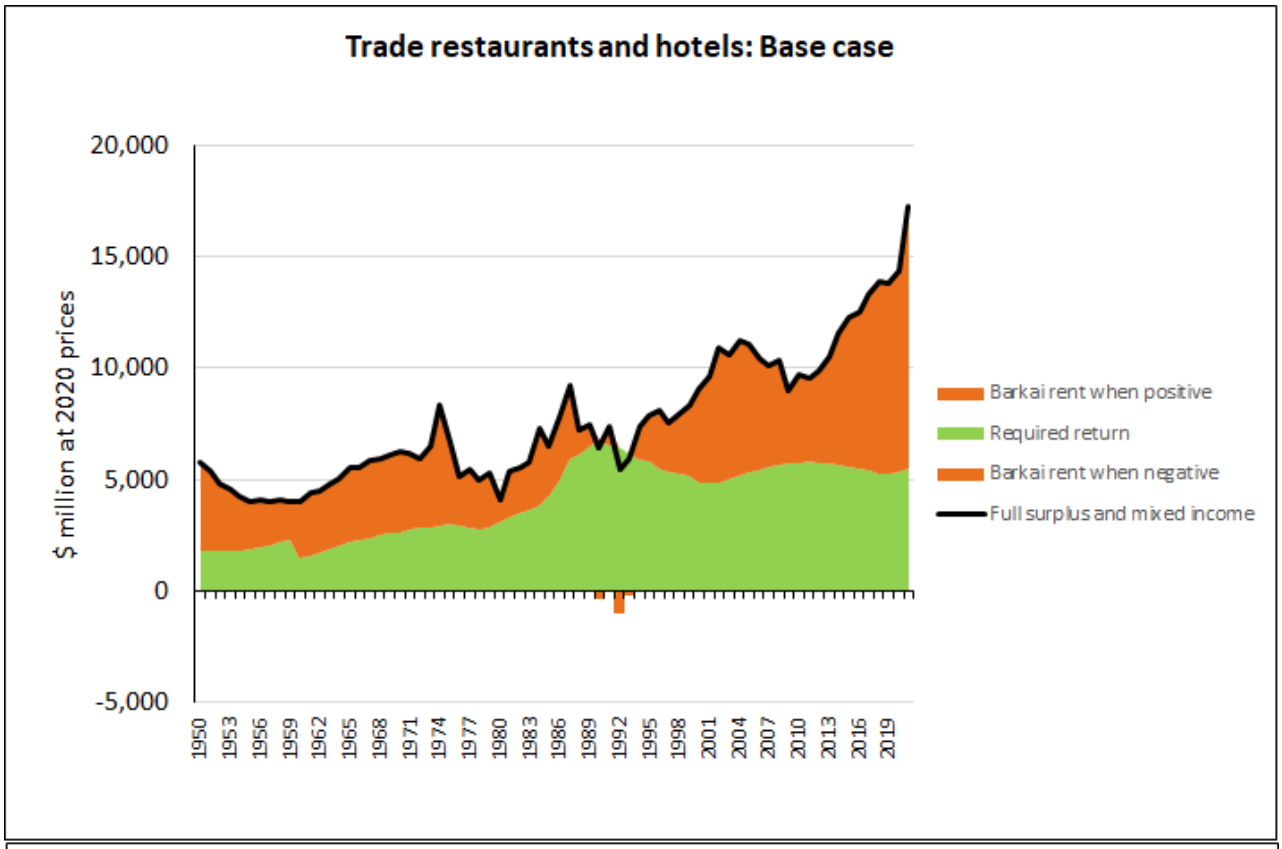
2019
Asdjusted rent when positive
Required return
Adjusted rent when negative
Full surplus and mixed income
Adjusted surplus

Figure 21


Trade restaurants and hotels: Base case
$ million at 2020 prices
20,000
15,000
10,000
5,000
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1962
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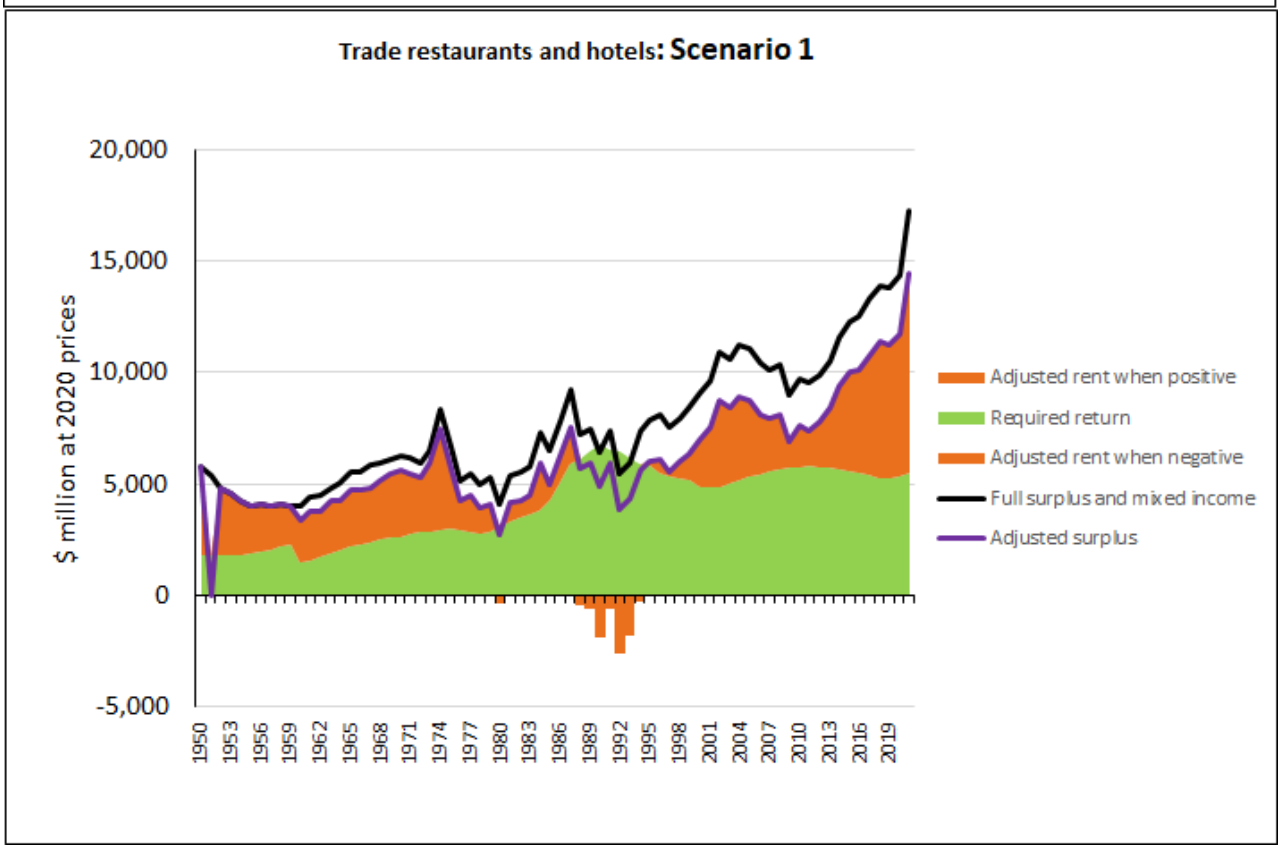
2016
2019
Barkai rent when positive
Required return
Barkai rent when negative
Full surplus and mixed income


Trade restaurants and hotels: Scenario 1
$ million at 2020 prices
20,000
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-5,000
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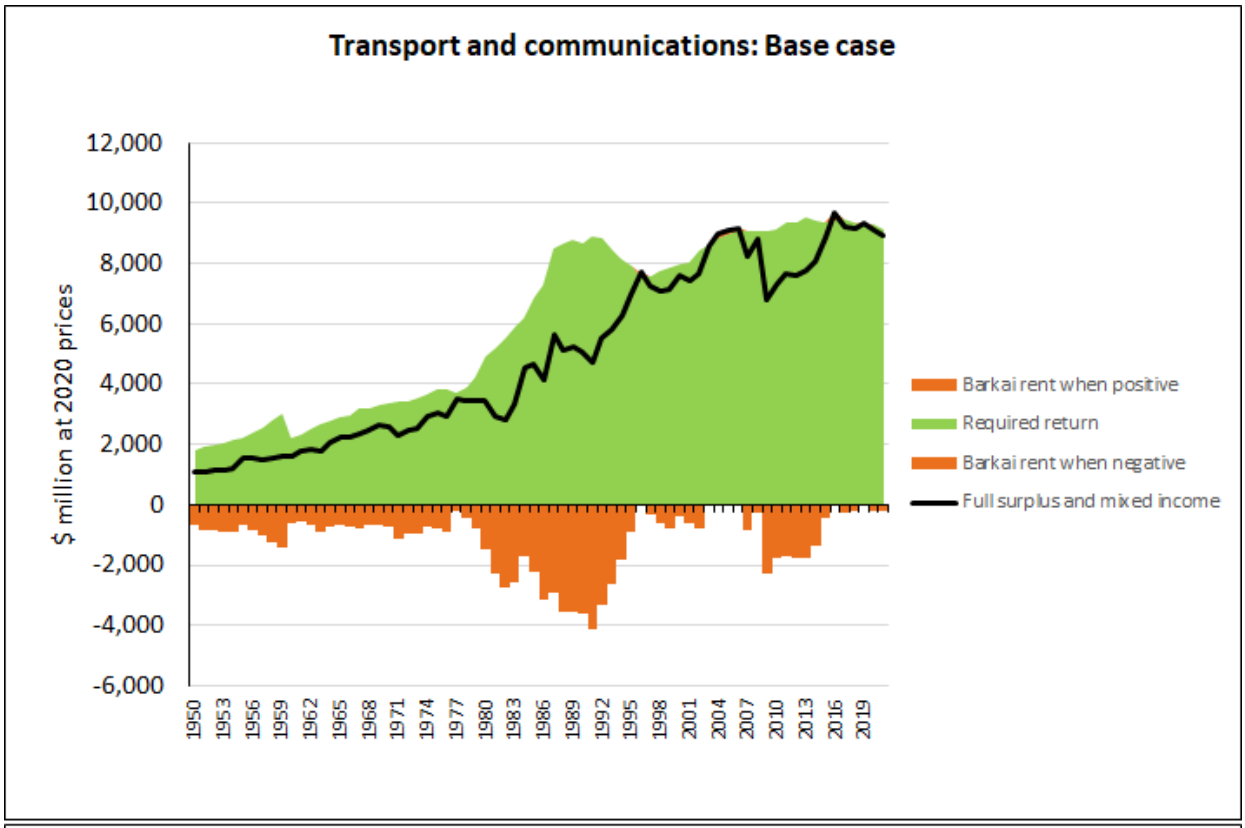
2016
2019
Adjusted rent when positive
Required return
Adjusted rent when negative
Full surplus and mixed income
Adjusted surplus

Figure 22


Transport and communications: Base case
$ million at 2020 prices
12,000
10,000
8,000
6,000
4,000
2,000
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-2,000
-4,000
-6,000
1950
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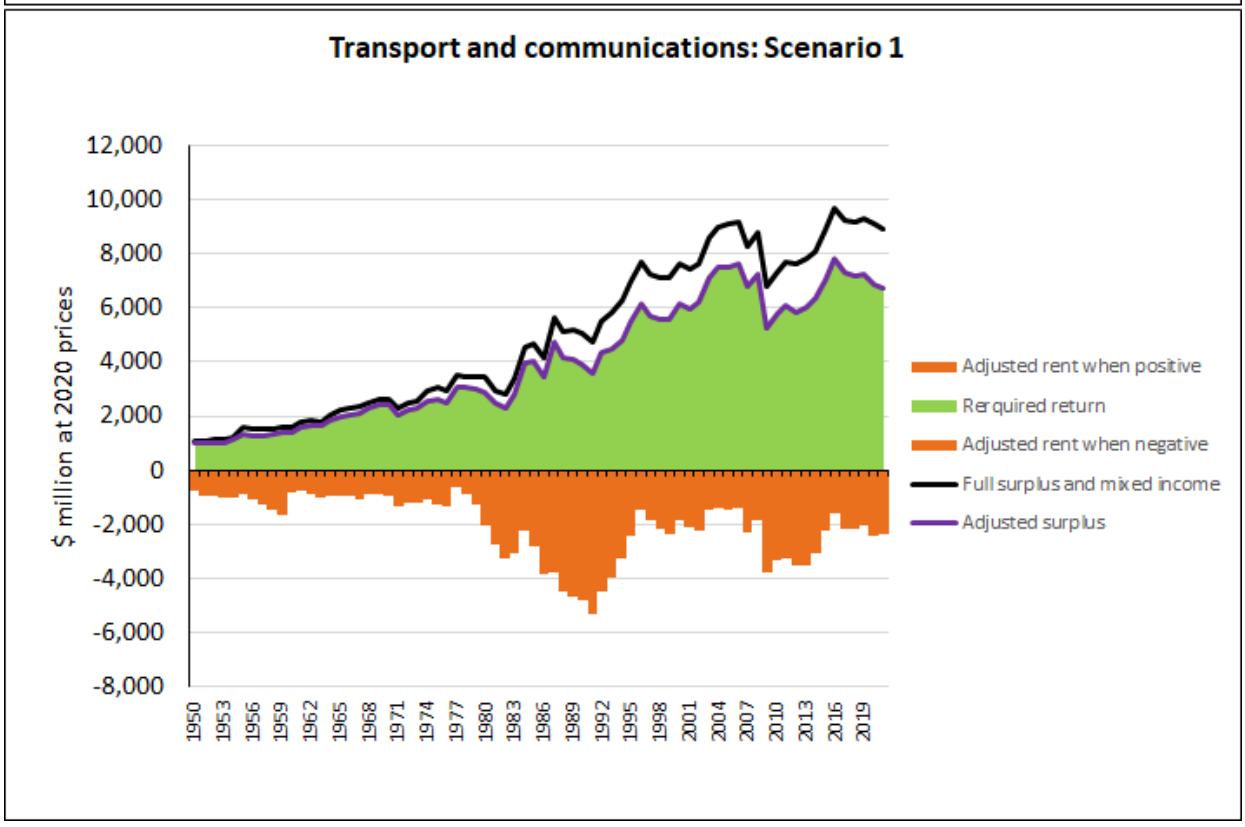
Barkai rent when positive
Required return
Barkai rent when negative
Full surplus and mixed income


Transport and communications: Scenario 1
$ million at 2020 prices
12,000
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-6,000
-8,000
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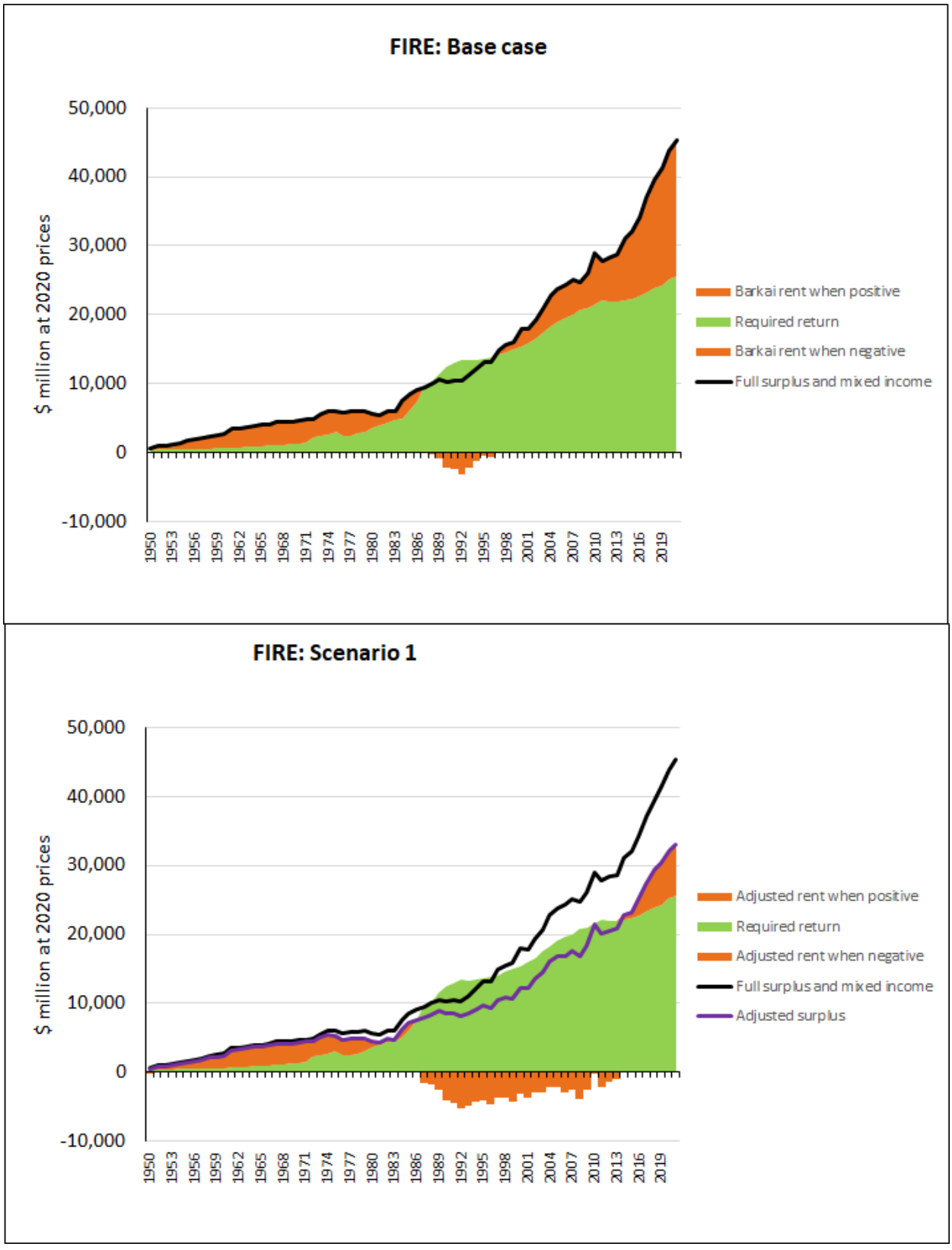
Adjusted rent when positive
Rerquired return
Adjusted rent when negative
Full surplus and mixed income
Adjusted surplus

Figure 23


FIRE: Base case
$ million at 2020 prices
50,000
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2019
Barkai rent when positive
Required return
Barkai rent when negative
Full surplus and mixed income
FIRE: Scenario 1
$ million at 2020 prices
50,000
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20,000
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-10,000
1950
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1956
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1962
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2016
2019
Adjusted rent when positive
Required return
Adjusted rent when negative
Full surplus and mixed income
Adjusted surplus

5. The issue of "intangible capital"

One explanation sometimes offered for apparently high and rising economic rents is that there are new forms of intangible assets which are unrecognised as capital in the National Accounts (e.g. Corrado et al., 2022, p. 15ff). This explanation proposes that an apparently excessive rate of return on assets recognised in the National Accounts is not economic rent but the required return on these unrecognised assets.

Here we argue that while the impact of intangibles on firm and economic performance may well be worth discussing in its own right, their "recognition" as assets does not satisfactorily explain why economic rents are rising.

We focus on hypothetical intangible assets created by some economic sacrifice (investment) that are not captured by the national-accounts statisticians.

The costs of the "unrecognised" intangible assets must have been funded either as part of the outlays recorded as "operating expenditure" or as part of the compensation of employees (as workers undertook self-funded training or innovative activity). The reconceptualization of some part of operating expenditure as investment in an asset (GFCF in terms of the National Accounts) means we must consider how this affects measured output and economic rents.

To recognise the "new" intangible assets, some of the expenditure currently classified as the cost of intermediate inputs, overheads or labour would need to be reclassified as investment in intangibles (GFCF). These costs could include for example bought-in innovation either embedded in physical assets or in consultancies. If this change were made, then not only would the warranted return on assets rise, but added value would also change, because the reclassified costs would be removed from the debit side of the added-value calculation while the revenue from outputs would reduce by depreciation of the newly recognised assets. Assuming "compensation of employees" (W) is unchanged as described below, measured operating surplus would change in lock step in dollar terms with added value. If depreciation on these assets is less than the GFCF in "hidden" intangibles, then added value and economic rent increase, and vice versa. Given GFCF must be at least as great as depreciation to maintain the asset base, added value *Y* and economic rent π can be expected to increase. Timing issues of course affect the result from year to year.

Recall the national-accounts identity in equation (2) above:

$$Y \equiv W + rK + \pi \equiv GO - IC \qquad (2)$$

$$\Rightarrow \qquad \pi = GO - IC - W - rK \qquad (3)$$

Here gross total income *Y* is the total income paid to labour plus the warranted return to capital plus any additional economic rent. It is also equal to gross output GO_t less intermediate consumption IC_t (costs other than labour) – in other words, added value.

Suppose that the accounts are now "corrected" to recognise that some part W_{NI} of reported compensation of employees W, plus some part IC_{NI} of reported intermediate costs IC, is actually investment in the creation of "new intangible" capital, the current unreported stock

of which is K_{NI}, on which the required return is $r_{NI}K_{NI}$[8]. With these changes made, the national accounts identity becomes

$$Y' \equiv W + rK + r_{NI}K_{NI} + \pi' \equiv (GO + W_{NI}) - (IC - IC_{NI})$$

$$\Rightarrow \quad \pi' \equiv GO - (IC - IC_{NI}) - (W - W_{NI}) - rK - r_{NI}K_{NI} \qquad (4)$$

What has happened here is that the total wage bill actually paid, W_t, remains the same but the part of it that is actually capital formation, W_{NI} , is added to gross output. At the same time the amount of intermediate consumption that is actually "new intangible" capital formation, IC_{NI} , is subtracted from IC. This means that total value added *Y* increases to *Y'*, and gross surplus $(GO - IC - W)$ increases to $[(GO + W_{NI}) - (IC - IC_{NI}) - W]$, but it is indeterminate whether the new recognised amount of rent π' is greater or less than the previously-recorded rent π. Formally, subtracting (3) from (4),

$$\pi' - \pi = (IC_{NI} + W_{NI}) - r_{NI}K_{NI} = GFCF_{NI} - r_{NI}K_{NI} \qquad (5)$$

This means that adjusting the national accounts for hidden <u>produced</u> intangible capital will reduce our estimate of Barkai rents <u>only insofar as the rate of capital formation in new intangibles is less than the required gross return on existing "hidden" produced intangibles (the "new intangibles")</u>.

While it is clear that adjusting for new intangible capital will increase gross operating surplus, the effect on net operating surplus is indeterminate. Net operating surplus changes from

$$GO - IC - W - \delta K$$

To

$$(GO + W_{NI}) - (IC - IC_{NI}) - W - \delta K - \delta_{NI}K_{NI}$$

Whence the change is

$$\Delta NOS = IC_{NI} + W_{NI} - \delta_{NI}K_{NI} = GFCF_{NI} - \delta_{NI}K_{NI}$$

So whether net surplus is increased or decreased depends on the relation of new investment in new intangibles compared with the amount of depreciation on the existing stock of new intangible capital.

To return to the original question: could apparent high economic rents be explained by the warranted return on new forms of intangible assets which are unrecognised as capital in the National Accounts? In answering this, we put aside for now the debates on whether these forms of intangibles should be regarded as capital.

If only the income side were considered, this suggestion would be true. Equation (2) would become:

$$\pi'' = GO - IC - W - rK - r_{NI}K_{NI}$$

$$= \pi - r_{NI}K_{NI}$$

[8] Recall that the required return on capital stock in the Barkai model is a weighted average of the separate returns on the three asset types. Here only the return on intangible assets is relevant, so r_{NI} will differ from r_t.

which is less than π for any positive r_{NI} and K_{NI}.

However this ignores the cost side of operating surplus and economic rents, namely IC_{NI} and W_{NI}. Recognised added value is increased by reclassifying the costs of the intangibles as capital formation and this counterbalances the income-side reduction in economic rents, so that the full impact on economic rent (equation (5)) will depend on the size of the costs/capital formation (and for net surpluses, the depreciation on the recognised capital). The full impact may actually increase economic rents from what is observed, or it could reduce them or leave them unchanged.

Consider two examples. Firstly, it is possible that some intangibles have few costs that could be capitalised, or these costs are concentrated at the time of creation of the intangible. For example the research and development required for a patent, and the process of obtaining the patent, create up-front costs and no income, while there are likely few capital costs during the patent's life (there may be operational costs such as maintaining the registration of the patent and those of any need to defend it). In that case, in scenario 1, compared to the patent being recognised as an asset, economic rents would appear lower in the establishment phase, and higher during its lifetime.[9]

A brand or trade mark may have a similar cost profile, though expenditure is often required on it throughout its life (e.g. Heys & Fotopoulou, 2022). This is not only to defend it but to maintain or increase its value as part of marketing and product quality, all of which have costs even if they are not recorded against the intangible itself, and some of which may be capitalised.

Secondly, at the other extreme, most of the additional forms of intangibles suggested for inclusion as assets in the National Accounts (e.g. Corrado et al., 2022, p. 7) – industrial design, marketing and branding, management practices, and employer-provided training – have costs throughout their lifetimes. For example, management practices and training are largely the wages and salaries of the employees involved plus perhaps some contracted-in content, and require continuity of funding. Industrial design may require regular updating and at times major changes and again is heavy in labour costs. In such cases, in scenario 1, compared to the intangibles being recognised as assets, economic rents could appear lower, the same or higher during their lifetimes, depending on the balance between the annual expenditure on them and warranted returns on the capital. It is likely they would explain little of the growing economic rents.

Nonetheless, recognising intangibles as assets, as in scenario 2, does increase gross operating surplus, increasing Gross Domestic Income by exactly the same amount but thereby lowering the labour income share of Gross Domestic Income. This is at one level simply an accounting

[9] Patents per se are not recognised as assets in the System of National Accounts 2008 (SNA 2008), but the substance of them as described is recognised as R&D and access to it. Paragraph 10.105 of SNA 2008 states: "With the inclusion of R&D expenditure as capital formation, patented entities no longer feature as assets in the SNA. The patent agreement is to be seen instead as the legal agreement concerning the terms on which access to the R&D is granted. The patent agreement is a form of licence to use which is treated as giving rise to payments for services or the acquisition of an asset." (United Nations et al., 2009)

change accomplished by converting expenses to GFCF. But it has the real consequence of implying that a greater proportion of added value belongs to the owners of capital rather than wage and salary earners, without changing the economic reality of productive capacity or revenue. It does not explain why the labour income share has been falling.

In our model, we can simulate these results by increasing intangible GFCF and Gross Operating Surplus, and allowing the results to flow through. If we double intangible GFCF, increasing GOS by the same dollar amount, with our other settings (such as for asset lives, leverage and market risk premium) unchanged, profits above warranted returns on the increased assets (economic rents) in 2021 are virtually unchanged at $52.6 billion (compared to $52.4 billion) but warranted return increases from $70.5 billion to $79.4 billion. Crouzet et al (2022, figure 1) assert that the value of intangible assets, when unrecognised ones are included, rose rapidly in the 1990s and early 2000s in US public firms and has been close to equal that of tangible assets over the last two decades.

If current intangible GFCF is increased by a factor of 4 (i.e. quadrupled) which makes it approximately equal to GFCF in tangible assets over the last decade in New Zealand, economic rent is barely changed at $53.1 billion in 2021 while warranted returns increase to $97.1 billion.

We can conclude that our dollar estimates of Barkai rents, and their increasing trend, are likely to be largely unaffected by capitalising even significant production costs into GFCF in unrecognised intangible assets. The rate of return in economic rents would however be affected because of the additional fixed assets.

6. A couple of reflections

The dataset developed in the course of this project will continue to be refined and extended. It is clear that there have been major swings in the amount of Barkai-rent accruing in the New Zealand economy, with the timing closely matching Barkai's (2020) results for the US economy. The sharp increase in rents, as measured by our data, since the Global Financial Crisis is striking, and the concentration of those rents in the finance and trade sectors of the economy (alongside the long-running rents of land-based primary production) indicates a major switch in the locus of accumulation away from traded-goods secondary industry sectors that had a leading role in the twentieth century. (See Table 5 and associated charts.)

A central feature of our charts is the apparent squeeze on rents in the 1980s, coinciding with a steep rise in the aggregate required return. This points to a possible shortcoming in the Barkai approach to estimation of rents, that it applies microeconomic measures drawn from finance on top of real macroeconomic magnitudes. If the squeeze were really as drastic as the charts seem to show, one would expect it to result in quite a marked deceleration in capital formation, due both to lower realized profits and higher capital costs. In fact, the data show the opposite: a steep rise in capital formation from 1980 to 1986, precisely when our required return was rising rapidly against a stagnant gross surplus.

To a large extent that rapid acceleration in capital formation during the 1980s can be explained (as we noted in Bertram & Rosenberg (2022)) by the impact of massive government

investments under the Muldoon Think Big programme – that is, by real-sector developments rather than the nominal shifts in interest rates and inflation that feature in Barkai's cost of capital. But there remains a lurking feeling that in interpreting results drawn from the Barkai model one needs to bear in mind the possibility that it may miss important elements in the rise of the rentier economy in both the global and the local settings.

What is happening in our charts is that expectations of returns on investment formed up to fifty years in the past are compared in each year with the actually-accruing surplus and mixed income in the present. The Barkai equations factor in capital gains that were anticipated at the time each vintage of capital formation was installed, but those previous expectations lie in the past and often will not reflect the accrual of actual capital gains, particularly in the high-inflation 1970s and 1980s. Equally, the Barkai procedure glosses over the extent to which even currently-accruing "required-return" surplus may represent rent in the true economic sense. Byegones, after all, are byegones, and once investment has been sunk into real assets the economic value of those assets is not the historic cost calculated in our model, but disposal value (Coase 1938 makes the point clearly). Clearly also, there are substantial rent components in the remuneration of the top echelon of managerial and executive labour-market "employees", and in various ways rents may be concealed in transactions that appear as costs in the national accounts. The estimates in this paper therefore are provisional – but we believe they are conservative. We continue to investigate these matters.

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Table 1: Self employed and employees: number

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Employees	Self employed	Total employed labour force	Unemployed	Total labour force	Self-employed % of employed labour force	Smoothed share
1939	549,348	151,214	700,562			22%	22%
1940	558,275	147,563	705,838			21%	21%
1941	567,201	143,913	711,114			20%	20%
1942	576,128	140,263	716,391			20%	20%
1943	585,055	136,612	721,667			19%	19%
1944	593,981	132,962	726,944			18%	18%
1945	602,908	129,312	732,220			18%	18%
1946	616,499	135,604	752,103			18%	18%
1947	630,090	141,897	771,987			18%	18%
1948	633,926	145,943	779,869			19%	19%
1949	638,854	150,152	789,006			19%	19%
1950	647,610	155,201	802,811			19%	19%
1951	649,511	158,537	808,048			20%	19%
1952	658,512	164,691	823,203			20%	19%
1953	677,733	158,629	836,362			19%	19%
1954	692,157	166,382	858,539			19%	19%
1955	709,699	163,352	873,051			19%	18%
1956	724,612	157,588	882,200	5,270	887,470	18%	18%
1957	743,680	155,920	899,600	5,154	904,754	17%	17%
1958	758,928	148,572	907,500	4,950	912,450	16%	17%
1959	774,511	157,689	932,200	5,243	937,443	17%	16%
1960	807,681	144,319	952,000	5,269	957,269	15%	15%
1961	839,427	137,273	976,700	4,493	981,193	14%	15%
1962	850,536	142,564	993,100	4,474	997,574	14%	14%
1963	876,879	135,321	1,012,200	5,161	1,017,361	13%	14%
1964	910,815	137,485	1,048,300	5,052	1,053,352	13%	13%
1965	945,534	138,466	1,084,000	5,248	1,089,248	13%	14%
1966	984,016	145,984	1,130,000	5,464	1,135,464	13%	14%
1967	970,228	179,872	1,150,100	5,947	1,156,047	16%	13%
1968	978,300	156,500	1,134,800	11,409	1,146,209	14%	13%
1969	1,025,271	139,129	1,164,400	12,035	1,176,435	12%	13%
1970	1,086,111	130,789	1,216,900	9,272	1,226,172	11%	12%
1971	1,107,159	145,241	1,252,400	9,548	1,261,948	12%	11%
1972	1,129,678	140,022	1,269,700	13,478	1,283,178	11%	11%
1973	1,180,209	134,291	1,314,500	15,755	1,330,255	10%	12%
1974	1,215,335	168,765	1,384,100	13,609	1,397,709	12%	12%
1975	1,222,379	190,021	1,412,400	13,992	1,426,392	13%	12%
1976	1,246,992	190,108	1,437,100	16,002	1,453,102	13%	13%
1977	1,268,835	186,265	1,455,100	13,164	1,468,264	13%	14%
1978	1,258,083	196,817	1,454,900	14,735	1,469,635	14%	14%
1979	1,252,177	228,123	1,480,300	21,925	1,502,225	15%	14%
1980	1,266,314	240,186	1,506,500	20,168	1,526,668	16%	14%

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Employees	Self employed	Total employed labour force	Unemployed	Total labour force	Self-employed % of employed labour force	Smoothed share
1981	1,309,918	194,582	1,504,500	32,287	1,536,787	13%	15%
1982	1,309,782	211,018	1,520,800	39,171	1,559,971	14%	15%
1983	1,291,136	224,564	1,515,700	51,394	1,567,094	15%	15%
1984	1,295,361	242,239	1,537,600	74,238	1,611,838	16%	16%
1985	1,335,941	267,659	1,603,600	64,083	1,667,683	17%	17%
1986	1,339,400	286,600	1,626,000	61,725	1,687,725	18%	17%
1987	1,322,300	296,900	1,619,200	70,100	1,689,300	18%	18%
1988	1,319,400	296,700	1,616,100	75,100	1,691,200	18%	19%
1989	1,257,400	298,300	1,555,700	105,000	1,660,700	19%	19%
1990	1,222,500	300,800	1,523,300	120,500	1,643,800	20%	20%
1991	1,226,800	304,200	1,531,000	145,100	1,676,100	20%	20%
1992	1,190,700	315,800	1,506,500	184,600	1,691,100	21%	21%
1993	1,193,700	324,400	1,518,100	177,000	1,695,100	21%	21%
1994	1,224,000	334,800	1,558,800	165,500	1,724,300	21%	21%
1995	1,289,900	341,400	1,631,300	136,300	1,767,600	21%	21%
1996	1,338,400	363,000	1,701,400	115,400	1,816,800	21%	21%
1997	1,381,700	364,200	1,745,900	119,100	1,865,000	21%	21%
1998	1,401,600	348,700	1,750,300	132,500	1,882,800	20%	21%
1999	1,381,800	358,600	1,740,400	146,100	1,886,500	21%	21%
2000	1,403,300	370,500	1,773,800	129,000	1,902,800	21%	20%
2001	1,435,100	374,100	1,809,200	113,100	1,922,300	21%	20%
2002	1,496,200	365,600	1,861,800	106,700	1,968,500	20%	20%
2003	1,543,100	369,700	1,912,800	105,100	2,017,900	19%	20%
2004	1,591,300	377,900	1,969,200	94,400	2,063,600	19%	19%
2005	1,649,400	390,900	2,040,300	83,200	2,123,500	19%	19%
2006	1,709,800	387,000	2,096,800	84,300	2,181,100	18%	18%
2007	1,766,200	374,800	2,141,000	84,500	2,225,500	18%	18%
2008	1,783,000	381,700	2,164,700	80,700	2,245,400	18%	17%
2009	1,815,699	361,301	2,177,000	98,800	2,275,800	17%	17%
2010	1,780,132	362,768	2,142,900	139,300	2,282,200	17%	17%
2011	1,790,328	372,072	2,162,400	143,500	2,305,900	17%	17%
2012	1,811,662	376,738	2,188,400	142,500	2,330,900	17%	17%
2013	1,806,696	373,904	2,180,600	147,600	2,328,200	17%	17%
2014	1,860,490	385,110	2,245,600	137,800	2,383,400	17%	17%
2015	1,934,092	395,008	2,329,100	133,000	2,462,100	17%	17%
2016	1,983,677	398,223	2,381,900	134,800	2,516,700	17%	17%
2017	2,097,183	421,117	2,518,300	134,400	2,652,700	17%	17%
2018	2,184,832	420,468	2,605,300	125,600	2,730,900	16%	17%
2019	2,225,140	436,760	2,661,900	119,100	2,781,000	16%	17%
2020	2,262,863	449,637	2,712,500	116,500	2,829,000	17%	17%
2021	2,268,472	462,228	2,730,700	134,800	2,865,500	17%	17%
2022			2,807,400	99,300	2,906,700		

Table 2: SNA data for "gross mixed income" 1950-2021, $million

	$ million						% of GDP excluding owner-occupied property						
	Net mixed income	Estimated depreciation on self-employed's capital	Estimated gross mixed income	Corporate gross operating surplus excl OOP	Gross operating surplus and mixed income excluding owner-occupied property	GDP at factor cost excluding owner occupied property	Net mixed income	Estimated depreciation on self-employed's capital	Estimated gross mixed income	Corporate gross operating surplus excl owner-occupied property	Gross operating surplus excl OOP	Gross operating surplus and mixed income excluding owner-occupied property	Mixed income share of gross operating surplus and mixed income
1950	263	65	328	179	507	997	26%	7%	33%	18%	18%	51%	65%
1951	402	77	480	238	718	1,265	32%	6%	38%	19%	19%	57%	67%
1952	331	79	410	242	652	1,299	25%	6%	32%	19%	19%	50%	63%
1953	356	91	447	235	683	1,372	26%	7%	33%	17%	17%	50%	66%
1954	396	99	495	270	765	1,528	26%	7%	32%	18%	18%	50%	65%
1955	411	112	523	307	830	1,683	24%	7%	31%	18%	18%	49%	63%
1956	411	120	531	318	849	1,773	23%	7%	30%	18%	18%	48%	63%
1957	456	140	596	304	899	1,875	24%	7%	32%	16%	16%	48%	66%
1958	505	160	665	289	954	2,006	25%	8%	33%	14%	14%	48%	70%
1959	465	152	616	363	979	2,076	22%	7%	30%	17%	17%	47%	63%
1960	499	150	650	407	1,056	2,217	23%	7%	29%	18%	18%	48%	61%
1961	526	158	685	480	1,165	2,419	22%	7%	28%	20%	20%	48%	59%
1962	467	159	626	540	1,166	2,505	19%	6%	25%	22%	22%	47%	54%
1963	536	172	707	595	1,302	2,721	20%	6%	26%	22%	22%	48%	54%
1964	604	185	790	651	1,440	2,965	20%	6%	27%	22%	22%	49%	55%
1965	629	192	821	741	1,561	3,250	19%	6%	25%	23%	23%	48%	53%
1966	657	210	867	790	1,657	3,511	19%	6%	25%	23%	23%	47%	52%
1967	594	235	830	830	1,660	3,663	16%	6%	23%	23%	23%	45%	50%
1968	597	240	837	870	1,707	3,795	16%	6%	22%	23%	23%	45%	49%
1969	594	247	841	977	1,818	4,018	15%	6%	21%	24%	24%	45%	46%
1970	657	269	926	1,092	2,017	4,461	15%	6%	21%	24%	24%	45%	46%
1971	693	306	999	1,132	2,131	5,076	14%	6%	20%	22%	22%	42%	47%

	$ million						% of GDP excluding owner-occupied property						
	Net mixed income	Estimated depreciation on self-employed's capital	Estimated gross mixed income	Corporate gross operating surplus excl OOP	Gross operating surplus and mixed income excluding owner-occupied property	GDP at factor cost excluding owner occupied property	Net mixed income	Estimated depreciation on self-employed's capital	Estimated gross mixed income	Corporate gross operating surplus excl owner-occupied property	Gross operating surplus excl OOP	Gross operating surplus and mixed income excluding owner-occupied property	Mixed income share of gross operating surplus and mixed income
1972	914	325	1,239	1,439	2,678	6,056	15%	5%	20%	24%	24%	44%	46%
1973	1,172	398	1,571	1,609	3,180	6,977	17%	6%	23%	23%	23%	46%	49%
1974	1,303	434	1,736	1,978	3,714	8,195	16%	5%	21%	24%	24%	45%	47%
1975	1,098	494	1,592	2,065	3,657	9,054	12%	5%	18%	23%	23%	40%	44%
1976	1,472	954	2,426	1,511	3,937	10,167	14%	9%	24%	15%	15%	39%	62%
1977	1,861	1,047	2,908	2,373	5,281	12,296	15%	9%	24%	19%	19%	43%	55%
1978	1,813	1,195	3,008	2,660	5,668	13,718	13%	9%	22%	19%	19%	41%	53%
1979	2,004	1,369	3,373	2,978	6,351	15,703	13%	9%	21%	19%	19%	40%	53%
1980	2,587	1,826	4,413	2,968	7,381	18,287	14%	10%	24%	16%	16%	40%	60%
1981	2,663	1,888	4,551	3,753	8,304	21,283	13%	9%	21%	18%	18%	39%	55%
1982	3,137	2,046	5,183	5,143	10,326	25,979	12%	8%	20%	20%	20%	40%	50%
1983	3,355	2,150	5,504	6,597	12,101	29,261	11%	7%	19%	23%	23%	41%	45%
1984	3,812	1,980	5,792	8,988	14,780	32,284	12%	6%	18%	28%	28%	46%	39%
1985	4,531	2,303	6,833	9,996	16,829	35,997	13%	6%	19%	28%	28%	47%	41%
1986	4,809	2,604	7,413	11,006	18,419	41,002	12%	6%	18%	27%	27%	45%	40%
1987	5,212	2,790	8,002	13,557	21,559	48,551	11%	6%	16%	28%	28%	44%	37%
1988	6,504	3,471	9,975	12,821	22,796	52,940	12%	7%	19%	24%	24%	43%	44%
1989	7,230	3,523	10,753	14,416	25,169	56,677	13%	6%	19%	25%	25%	44%	43%
1990	7,955	3,946	11,901	14,607	26,508	58,950	13%	7%	20%	25%	25%	45%	45%
1991	7,203	3,595	10,798	16,352	27,150	59,999	12%	6%	18%	27%	27%	45%	40%
1992	7,895	4,435	12,330	15,029	27,359	59,893	13%	7%	21%	25%	25%	46%	45%
1993	7,660	4,257	11,917	17,347	29,264	62,483	12%	7%	19%	28%	28%	47%	41%
1994	8,735	4,176	12,911	20,461	33,372	68,138	13%	6%	19%	30%	30%	49%	39%

	$ million						% of GDP excluding owner-occupied property						
	Net mixed income	Estimated depreciation on self-employed's capital	Estimated gross mixed income	Corporate gross operating surplus excl OOP	Gross operating surplus and mixed income excluding owner-occupied property	GDP at factor cost excluding owner occupied property	Net mixed income	Estimated depreciation on self-employed's capital	Estimated gross mixed income	Corporate gross operating surplus excl owner-occupied property	Gross operating surplus excl OOP	Gross operating surplus and mixed income excluding owner-occupied property	Mixed income share of gross operating surplus and mixed income
1995	9,445	4,161	13,606	22,527	36,133	73,221	13%	6%	19%	31%	31%	49%	38%
1996	10,299	4,265	14,564	23,660	38,224	77,553	13%	5%	19%	31%	31%	49%	38%
1997	10,235	4,381	14,616	24,832	39,448	81,418	13%	5%	18%	30%	30%	48%	37%
1998	10,645	4,420	15,065	25,618	40,683	84,390	13%	5%	18%	30%	30%	48%	37%
1999	11,292	4,466	15,758	25,818	41,576	86,290	13%	5%	18%	30%	30%	48%	38%
2000	13,060	4,014	17,074	29,156	46,230	92,047	14%	4%	19%	32%	32%	50%	37%
2001	13,810	4,291	18,101	31,909	50,010	98,151	14%	4%	18%	33%	33%	51%	36%
2002	14,869	4,998	19,867	34,543	54,410	106,131	14%	5%	19%	33%	33%	51%	37%
2003	13,622	4,216	17,838	37,836	55,674	110,804	12%	4%	16%	34%	34%	50%	32%
2004	15,360	4,033	19,393	39,744	59,137	118,510	13%	3%	16%	34%	34%	50%	33%
2005	15,466	4,439	19,905	42,521	62,426	126,773	12%	4%	16%	34%	34%	49%	32%
2006	14,929	4,691	19,620	44,163	63,783	133,479	11%	4%	15%	33%	33%	48%	31%
2007	16,844	4,435	21,279	45,036	66,315	140,764	12%	3%	15%	32%	32%	47%	32%
2008	19,971	4,224	24,195	48,606	72,801	153,582	13%	3%	16%	32%	32%	47%	33%
2009	15,934	6,124	22,058	49,172	71,230	156,334	10%	4%	14%	31%	31%	46%	31%
2010	17,687	6,470	24,157	51,292	75,449	161,271	11%	4%	15%	32%	32%	47%	32%
2011	20,402	6,228	26,630	51,859	78,489	167,320	12%	4%	16%	31%	31%	47%	34%
2012	21,913	7,244	29,157	52,539	81,696	174,001	13%	4%	17%	30%	30%	47%	36%
2013	19,794	6,431	26,225	55,396	81,621	176,674	11%	4%	15%	31%	31%	46%	32%
2014	24,463	7,001	31,464	59,503	90,967	189,721	13%	4%	17%	31%	31%	48%	35%
2015	21,665	6,747	28,412	64,381	92,793	197,169	11%	3%	14%	33%	33%	47%	31%
2016	22,501	6,861	29,362	67,723	97,085	207,024	11%	3%	14%	33%	33%	47%	30%
2017	27,934	6,989	34,923	68,933	103,856	219,559	13%	3%	16%	31%	31%	47%	34%

	$ million						% of GDP excluding owner-occupied property						
	Net mixed income	Estimated depreciation on self-employed's capital	Estimated gross mixed income	Corporate gross operating surplus excl OOP	Gross operating surplus and mixed income excluding owner-occupied property	GDP at factor cost excluding owner occupied property	Net mixed income	Estimated depreciation on self-employed's capital	Estimated gross mixed income	Corporate gross operating surplus excl owner-occupied property	Gross operating surplus excl OOP	Gross operating surplus and mixed income excluding owner-occupied property	Mixed income share of gross operating surplus and mixed income
2018	30,014	7,110	37,124	75,907	113,031	235,836	13%	3%	16%	32%	32%	48%	33%
2019	31,731	7,473	39,204	77,889	117,093	247,658	13%	3%	16%	31%	31%	47%	33%
2020	34,936	7,334	42,270	83,596	125,866	265,179	13%	3%	16%	32%	32%	47%	34%
2021	38,756	5,678	44,434	87,603	132,037	276,072	14%	2%	16%	32%	32%	48%	34%
2022	38,756	10,367	49,123										

Table 3 Gross and net income of the self-employed

	$million						
	Total market economy excluding owner occupied property			Entrepreneurial income (used as estimate of net mixed income)			
	(1)	(2)	(4)	(5)	(6)	(7)	(8)
	Gross surplus and mixed income	Gross mixed income	Corporate operating surplus	Farm	Non-farm	Total	Adjusted series
1950	507	328	179	186	96	282	263
1951	718	480	238	337	114	451	402
1952	652	410	242	215	132	347	331
1953	683	447	235	228	142	370	356
1954	765	495	270	251	157	408	396
1955	830	523	307	253	170	423	411
1956	849	531	318	255	178	433	411
1957	899	596	304	268	192	460	456
1958	954	665	289	248	214	462	505
1959	979	616	363	250	203	453	465
1960	1,056	650	407	299	209	508	499
1961	1,165	685	480	278	243	521	526
1962	1,166	626	540	241	254	495	467
1963	1,302	707	595	278	268	546	536
1964	1,440	790	651	332	280	612	604
1965	1,561	821	741	334	300	634	629
1966	1,657	867	790	329	317	646	657
1967	1,660	830	830	279	310	589	594
1968	1,707	837	870	279	299	578	597
1969	1,818	841	977	289	311	600	594
1970	2,017	926	1,092	321	340	661	657
1971	2,131	999	1,132	325	374	699	693
1972	2,678	1,239	1,439	440	485	914	914
1973	3,180	1,571	1,609	631	558	1,172	1,172
1974	3,714	1,736	1,978	618	700	1,303	1,303
1975	3,657	1,592	2,065	333	770	1,098	1,098
1976	3,937	2,426	1,511	613	873	1,472	1,472
1977	5,281	2,908	2,373	840	1,042	1,861	1,861
1978	5,668	3,008	2,660	696	1,132	1,813	1,813
1979	6,351	3,373	2,978	787	1,234	2,004	2,004
1980	7,381	4,413	2,968	1,281	1,339	2,587	2,587
1981	8,304	4,551	3,753	1,122	1,566	2,663	2,663
1982	10,326	5,183	5,143	1,197	1,965	3,137	3,137
1983	12,101	5,504	6,597	1,123	2,252	3,355	3,355
1984	14,780	5,792	8,988	1,218	2,615	3,812	3,812
1985	16,829	6,833	9,996	1,513	3,045	4,531	4,531
1986	18,419	7,413	11,006	1,107	3,711	4,809	4,809
1987	21,559	8,002	13,557	964	4,248	5,212	5,212
1988	22,796	9,975	12,821	1519	4,985	6,504	6,504

	$million						
	Total market economy excluding owner occupied property			Entrepreneurial income (used as estimate of net mixed income)			
	(1)	(2)	(4)	(5)	(6)	(7)	(8)
	Gross surplus and mixed income	Gross mixed income	Corporate operating surplus	Farm	Non-farm	Total	Adjusted series
1989	25,169	10,753	14,416	1807	5,423	7,230	7,230
1990	26,508	11,901	14,607	2010	5,945	7,955	7,955
1991	27,150	10,798	16,352	1208	5,995	7,203	7,203
1992	27,359	12,330	15,029	1939	5,957	7,895	7,895
1993	29,264	11,917	17,347	1884	5,776	7,660	7,660
1994	33,372	12,911	20,461	2372	6,363	8,735	8,735
1995	36,133	13,606	22,527	2157	7,288	9,445	9,445
1996	38,224	14,564	23,660	2104	8,195	10,299	10,299
1997	39,448	14,616	24,832	2028	8,207	10,235	10,235
1998	40,683	15,065	25,618	1875	8,770	10,645	10,645
1999	41,576	15,758	25,818	1931	9,361	11,292	11,292
2000	46,230	17,074	29,156	2616	10,445	13,060	13,060
2001	50,010	18,101	31,909	4355	9,454	13,810	13,810
2002	54,410	19,867	34,543	4994	9,875	14,869	14,869
2003	55,674	17,838	37,836	3196	10,426	13,622	13,622
2004	59,137	19,393	39,744	3520	11,839	15,360	15,360
2005	62,426	19,905	42,521	3263	12,202	15,466	15,466
2006	63,783	19,620	44,163	2356	12,573	14,929	14,929
2007	66,315	21,279	45,036	2992	13,852	16,844	16,844
2008	72,801	24,195	48,606	5358	14,613	19,971	19,971
2009	71,230	22,058	49,172	2358	13,577	15,934	15,934
2010	75,449	24,157	51,292	3713	13,974	17,687	17,687
2011	78,489	26,630	51,859	5708	14,694	20,402	20,402
2012	81,696	29,157	52,539	5908	16,005	21,913	21,913
2013	81,621	26,225	55,396	4230	15,564	19,794	19,794
2014	90,967	31,464	59,503	8459	16,004	24,463	24,463
2015	92,793	28,412	64,381	2895	18,769	21,665	21,665
2016	97,085	29,362	67,723	2220	20,281	22,501	22,501
2017	103,856	34,923	68,933	5553	22,381	27,934	27,934
2018	113,031	37,124	75,907	6662	23,351	30,014	30,014
2019	117,093	39,204	77,889	6184	25,547	31,731	31,731
2020	125,866	42,270	83,596	7261	27,675	34,936	34,936
2021	132,037	44,434	87,603	7458	31,297	38,756	38,756
2022		49,123		8833	31,825	40,659	

Table 4: Four scenarios applied

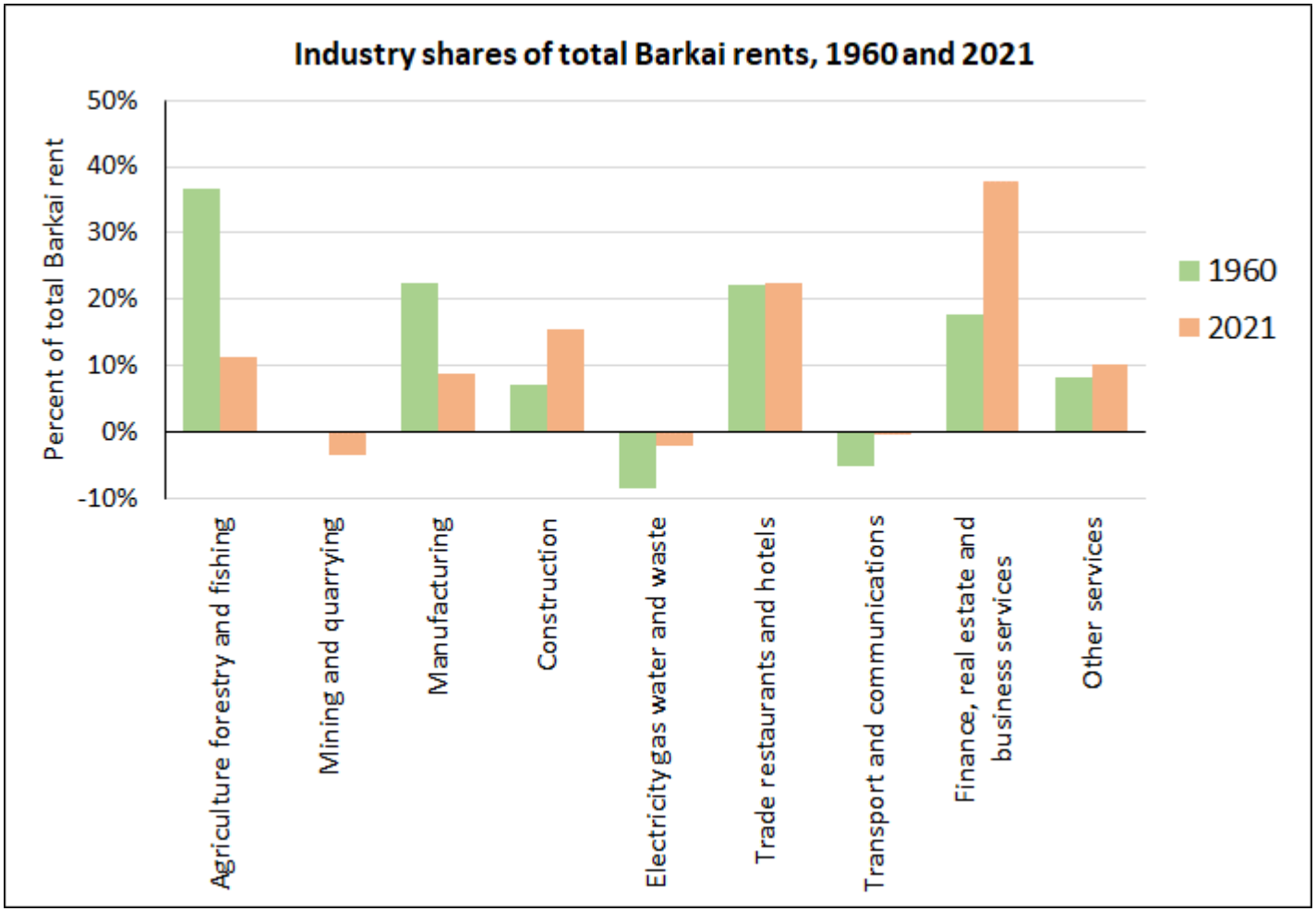
					Scenario 1	Scenario 2	Scenario 3	Scenario 4		% of market GDP					
	Gross operating surplus and mixed income $m	Gross mixed income $m	Estimated wage rate for the market economy $/employee	Number of self-employed	Pay the average wage to self-employed	Adjust scenario 1 for 20% under-reporting of mixed income	Labour share set equal to that of employees	Adjust scenario 3 for 20% under-reporting of mixed income	Market GDP $m	Gross operating surplus and mixed income	Gross mixed income	Self-employed labour income: Scenario 1	Self-employed labour income: Scenario 2	Self-employed labour income: Scenario 3	Self-employed labour income: Scenario 4
1950	569	328	427	155,201	66	-16	127	45	1,040	55%	32%	6%	-2%	12%	4%
1951	740	480	485	158,537	77	-43	182	62	1,311	56%	37%	6%	-3%	14%	5%
1952	678	410	547	164,691	90	-13	157	55	1,350	50%	30%	7%	-1%	12%	4%
1953	736	447	573	158,629	91	-21	177	65	1,428	52%	31%	6%	-1%	12%	5%
1954	816	495	613	166,382	102	-22	192	68	1,590	51%	31%	6%	-1%	12%	4%
1955	915	523	1,250	163,352	204	74	379	248	1,749	52%	30%	12%	4%	22%	14%
1956	930	531	1,327	157,588	209	76	388	256	1,845	50%	29%	11%	4%	21%	14%
1957	979	596	1,366	155,920	213	64	446	297	1,952	50%	31%	11%	3%	23%	15%
1958	1,012	665	1,445	148,572	215	49	512	346	2,087	48%	32%	10%	2%	25%	17%
1959	1,031	616	1,474	157,689	232	78	455	301	2,161	48%	29%	11%	4%	21%	14%
1960	1,093.9	650	1,495	144,319	216	53	474	311	2,306	47%	28%	9%	2%	21%	13%
1961	1,138.6	685	1,559	137,273	214	43	491	320	2,510	45%	27%	9%	2%	20%	13%
1962	1,166.5	626	1,664	142,564	237	81	447	290	2,608	45%	24%	9%	3%	17%	11%
1963	1,285.7	707	1,692	135,321	229	52	490	313	2,851	45%	25%	8%	2%	17%	11%
1964	1,466.8	790	1,757	137,485	242	44	546	349	3,103	47%	25%	8%	1%	18%	11%
1965	1,565.2	821	1,892	138,466	262	57	569	364	3,402	46%	24%	8%	2%	17%	11%
1966	1,703.1	867	1,986	145,984	290	73	602	385	3,680	46%	24%	8%	2%	16%	10%
1967	1,741.6	830	2,102	179,872	378	171	562	355	3,841	45%	22%	10%	4%	15%	9%
1968	1,803.1	837	2,167	156,500	339	130	563	354	3,988	45%	21%	9%	3%	14%	9%
1969	1,976.0	841	2,178	139,129	303	93	556	346	4,221	47%	20%	7%	2%	13%	8%
1970	2,182.6	926	2,295	130,789	300	69	615	384	4,678	47%	20%	6%	1%	13%	8%
1971	2,388.7	999	2,704	145,241	393	143	693	443	5,314	45%	19%	7%	3%	13%	8%
1972	2,568	1,239	2,990	140,022	419	109	947	637	5,240	49%	24%	8%	2%	18%	12%

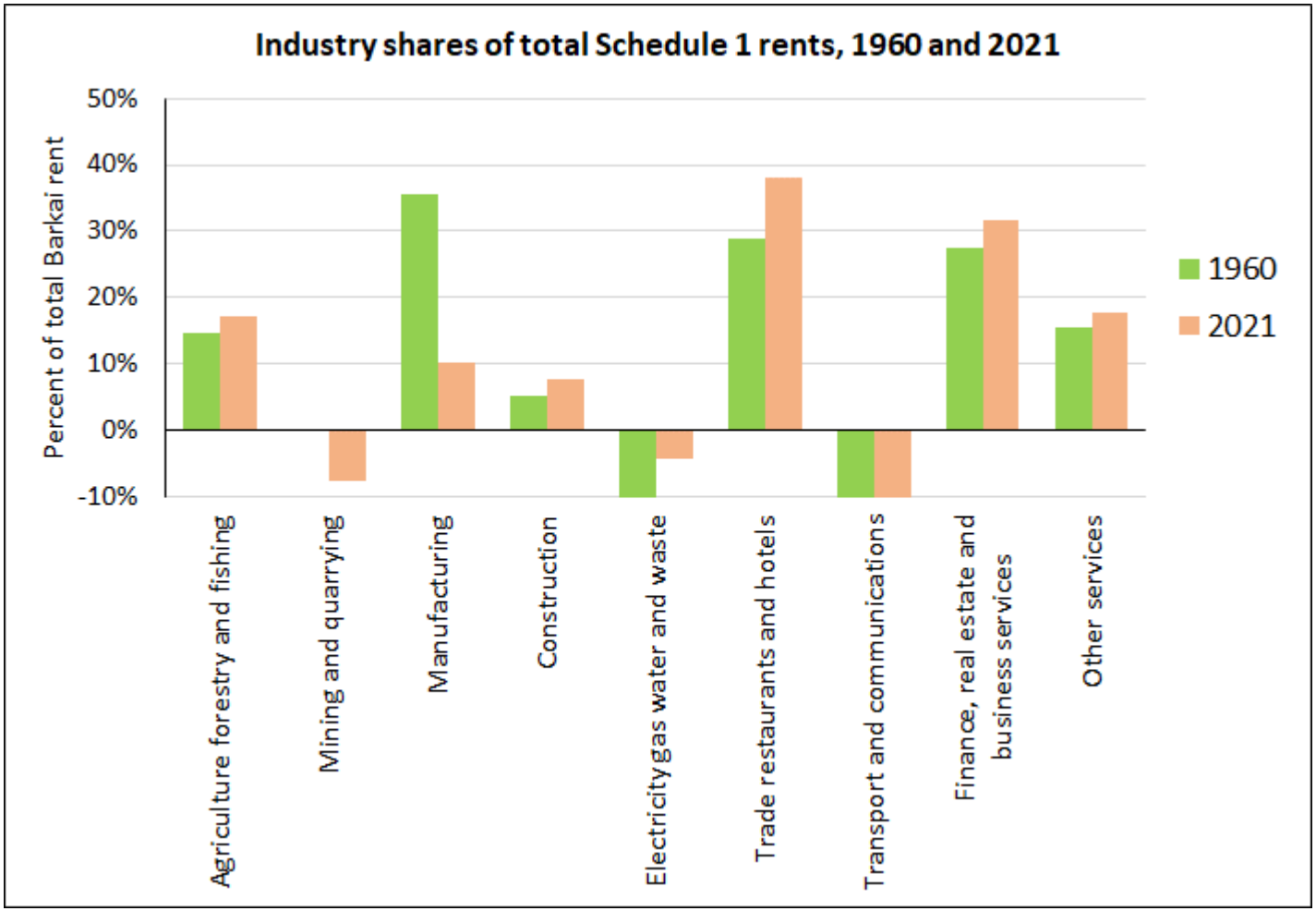
					Scenario 1	Scenario 2	Scenario 3	Scenario 4		% of market GDP					
	Gross operating surplus and mixed income $m	Gross mixed income $m	Estimated wage rate for the market economy $/employee	Number of self-employed	Pay the average wage to self-employed	Adjust scenario 1 for 20% under-reporting of mixed income	Labour share set equal to that of employees	Adjust scenario 3 for 20% under-reporting of mixed income	Market GDP $m	Gross operating surplus and mixed income	Gross mixed income	Self-employed labour income: Scenario 1	Self-employed labour income: Scenario 2	Self-employed labour income: Scenario 3	Self-employed labour income: Scenario 4
1973	3,055	1,571	3,220	134,291	432	40	1,207	814	6,055	50%	26%	7%	1%	20%	13%
1974	3,570	1,736	3,690	168,765	623	189	1,332	898	7,104	50%	24%	9%	3%	19%	13%
1975	3,487	1,592	4,416	190,021	839	441	1,300	902	7,761	45%	21%	11%	6%	17%	12%
1976	3,716	2,426	4,998	190,108	950	344	2,271	1,664	8,602	43%	28%	11%	4%	26%	19%
1977	5,014	2,908	5,528	186,265	1,030	303	2,432	1,704	10,531	48%	28%	10%	3%	23%	16%
1978	5,351	3,008	6,399	196,817	1,260	508	2,555	1,803	11,604	46%	26%	11%	4%	22%	16%
1979	5,984	3,373	7,469	228,123	1,704	860	2,953	2,109	13,115	46%	26%	13%	7%	23%	16%
1980	6,938	4,413	8,613	240,186	2,069	966	3,993	2,890	15,256	45%	29%	14%	6%	26%	19%
1981	7,785	4,551	9,907	194,582	1,928	790	4,081	2,943	17,532	44%	26%	11%	5%	23%	17%
1982	9,691	5,183	11,950	211,018	2,522	1,226	4,522	3,226	21,469	45%	24%	12%	6%	21%	15%
1983	11,365	5,504	13,291	224,564	2,985	1,609	4,568	3,192	24,258	47%	23%	12%	7%	19%	13%
1984	14,010	5,792	13,512	242,239	3,273	1,825	4,281	2,833	27,138	52%	21%	12%	7%	16%	10%
1985	15,982	6,833	14,346	267,659	3,840	2,132	4,931	3,223	30,562	52%	22%	13%	7%	16%	11%
1986	17,434	7,413	16,861	286,600	4,832	2,979	5,470	3,617	34,654	50%	21%	14%	9%	16%	10%
1987	20,431	8,002	20,416	296,900	6,061	4,061	5,941	3,940	40,783	50%	20%	15%	10%	15%	10%
1988	21,557	9,975	22,847	296,700	6,779	4,285	7,908	5,414	44,330	49%	23%	15%	10%	18%	12%
1989	23,815	10,753	25,058	298,300	7,475	4,786	8,303	5,615	47,366	50%	23%	16%	10%	18%	12%
1990	25,044	11,901	26,538	300,800	7,983	5,007	9,229	6,253	49,231	51%	24%	16%	10%	19%	13%
1991	25,585	10,798	26,775	304,200	8,145	5,446	8,154	5,454	49,896	51%	22%	16%	11%	16%	11%
1992	25,702	12,330	27,323	315,800	8,629	5,546	9,678	6,596	49,653	52%	25%	17%	11%	19%	13%
1993	27,518	11,917	27,829	324,400	9,028	6,049	8,975	5,996	52,044	53%	23%	17%	12%	17%	12%
1994	31,550	12,911	28,403	334,800	9,509	6,282	9,249	6,021	57,406	55%	22%	17%	11%	16%	10%
1995	34,255	13,606	28,752	341,400	9,816	6,414	9,572	6,170	62,300	55%	22%	16%	10%	15%	10%
1996	36,257	14,564	29,387	363,000	10,667	7,026	10,275	6,634	66,157	55%	22%	16%	11%	16%	10%
1997	37,384	14,616	30,375	364,200	11,063	7,409	10,407	6,753	69,360	54%	21%	16%	11%	15%	10%

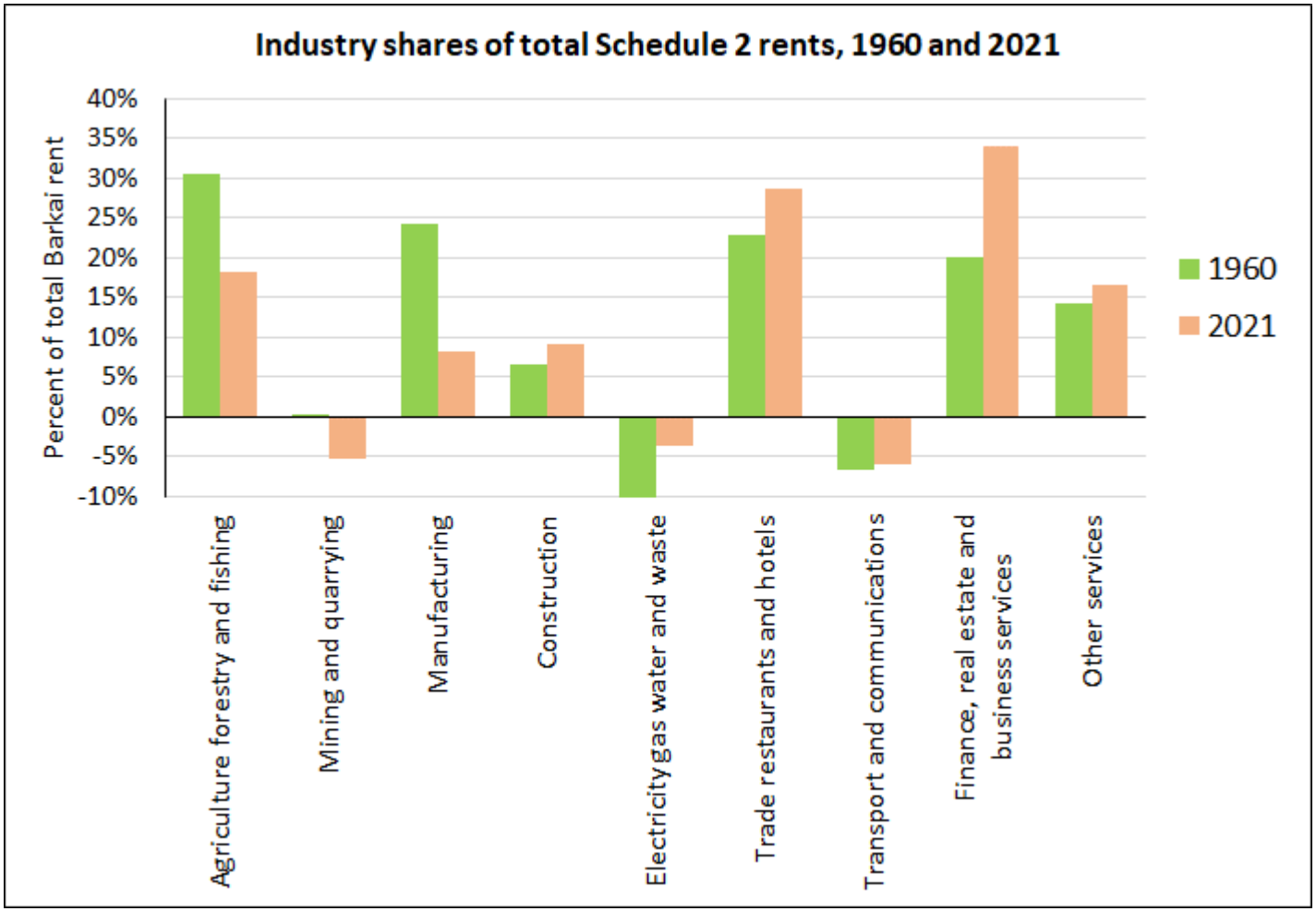
					Scenario 1	Scenario 2	Scenario 3	Scenario 4		% of market GDP					
	Gross operating surplus and mixed income $m	Gross mixed income $m	Estimated wage rate for the market economy $/employee	Number of self-employed	Pay the average wage to self-employed	Adjust scenario 1 for 20% under-reporting of mixed income	Labour share set equal to that of employees	Adjust scenario 3 for 20% under-reporting of mixed income	Market GDP $m	Gross operating surplus and mixed income	Gross mixed income	Self-employed labour income: Scenario 1	Self-employed labour income: Scenario 2	Self-employed labour income: Scenario 3	Self-employed labour income: Scenario 4
1998	38,500	15,065	31,184	348,700	10,874	7,108	10,792	7,025	71,692	54%	21%	15%	10%	15%	10%
1999	39,162	15,758	32,359	358,600	11,604	7,664	11,469	7,529	72,645	54%	22%	16%	11%	16%	10%
2000	43,684	17,074	32,649	370,500	12,097	7,828	11,938	7,669	77,920	56%	22%	16%	10%	15%	10%
2001	47,192	18,101	33,546	374,100	12,550	8,024	12,453	7,927	83,315	57%	22%	15%	10%	15%	10%
2002	51,475	19,867	34,568	365,600	12,638	7,671	13,590	8,623	90,535	57%	22%	14%	8%	15%	10%
2003	52,710	17,838	35,728	369,700	13,209	8,749	12,016	7,556	94,298	56%	19%	14%	9%	13%	8%
2004	56,124	19,393	37,310	377,900	14,100	9,251	13,213	8,365	100,857	56%	19%	14%	9%	13%	8%
2005	59,195	19,905	39,012	390,900	15,250	10,274	13,679	8,703	107,652	55%	18%	14%	10%	13%	8%
2006	60,273	19,620	40,761	387,000	15,775	10,870	13,761	8,856	112,825	53%	17%	14%	10%	12%	8%
2007	62,502	21,279	42,153	374,800	15,799	10,479	15,376	10,056	118,506	53%	18%	13%	9%	13%	8%
2008	68,788	24,195	45,305	381,700	17,293	11,244	17,555	11,506	129,642	53%	19%	13%	9%	14%	9%
2009	66,875	22,058	46,871	361,301	16,935	11,420	16,471	10,957	130,202	51%	17%	13%	9%	13%	8%
2010	70,871	24,157	48,211	362,768	17,489	11,450	17,865	11,826	133,853	53%	18%	13%	9%	13%	9%
2011	73,806	26,630	49,618	372,072	18,461	11,804	19,928	13,270	139,027	53%	19%	13%	8%	14%	10%
2012	76,820	29,157	50,951	376,738	19,195	11,906	22,026	14,737	144,836	53%	20%	13%	8%	15%	10%
2013	76,592	26,225	52,610	373,904	19,671	13,115	19,551	12,995	146,882	52%	18%	13%	9%	13%	9%
2014	85,788	31,464	53,079	385,110	20,441	12,575	23,037	15,171	158,966	54%	20%	13%	8%	14%	10%
2015	87,323	28,412	53,967	395,008	21,317	14,214	20,529	13,426	165,053	53%	17%	13%	9%	12%	8%
2016	91,218	29,362	55,422	398,223	22,070	14,730	21,120	13,779	173,847	52%	17%	13%	8%	12%	8%
2017	97,750	34,923	55,171	421,117	23,234	14,503	25,468	16,737	185,057	53%	19%	13%	8%	14%	9%
2018	106,650	37,124	56,207	420,468	23,633	14,352	26,539	17,258	199,817	53%	19%	12%	7%	13%	9%
2019	110,279	39,204	58,679	436,760	25,629	15,828	28,431	18,630	208,799	53%	19%	12%	8%	14%	9%
2020	118,841	42,270	61,566	449,637	27,682	17,115	31,266	20,698	223,362	53%	19%	12%	8%	14%	9%
2021	124,708	44,434	63,493	462,228	29,348	18,240	32,866	21,758	231,595	54%	19%	13%	8%	14%	9%

Table 5: Comparison of rent shares, 1960 and 2021.

	$ million at 2020 prices											
	Barkai rent		Schedule 1 rent		Schedule 2 rent		% of total Barkai rent		% of Schedule 1 rent		% of Schedule 2 rent	
	1960	2021	1960	2021	1960	2021	1960	2021	1960	2021	1960	2021
Agriculture forestry and fishing	4,283	5,952	985	3,999	3,196	6,252	37%	11%	15%	17%	31%	18%
Mining and quarrying	0.00	-1,791	-1	-1,844	8	-1,832	0%	-3%	0%	-8%	0%	-5%
Manufacturing	2,617	4,527	2,381	2,400	2,526	2,834	22%	9%	36%	10%	24%	8%
Construction	836	8,158	351	1,807	679	3,103	7%	16%	5%	8%	6%	9%
Electricity gas water and waste	-1,014	-1,131	-1,014	-1,014	-1,236	-1,236	-9%	-2%	-15%	-4%	-12%	-4%
Trade restaurants and hotels	2,587	11,774	1,936	8,960	2,382	9,893	22%	22%	29%	38%	23%	29%
Transport and communications	-619	-225	-815	-2,386	-689	-2,042	-5%	0%	-12%	-10%	-7%	-6%
Finance, real estate and business services	2,053	19,737	1,830	7,403	2,094	11,735	18%	38%	27%	32%	20%	34%
Other services	942	5,373	1,030	4,135	1,484	5,700	8%	10%	15%	18%	14%	17%
Total	11,681	52,384	6,683	23,459	10,443	34,407	100%	100%	100%	100%	100%	100%


Industry shares of total Barkai rents, 1960 and 2021
Percent of total Barkai rent
50%
40%
30%
20%
10%
0%
-10%
1960
2021
Agriculture forestry and fishing
Mining and quarrying
Manufacturing
Construction
Electricitygas water and waste
Trade restaurants and hotels
Transport and communications
Finance, real estate and business services
Other services


Industry shares of total Schedule 1 rents, 1960 and 2021
Percent of total Barkai rent
50%
40%
30%
20%
10%
0%
-10%
1960
2021
Agriculture forestry and fishing
Mining and quarrying
Manufacturing
Construction
Electricitygas water and waste
Trade restaurants and hotels
Transport and communications
Finance, real estate and business services
Other services


Industry shares of total Schedule 2 rents, 1960 and 2021
Percent of total Barkai rent
40%
35%
30%
25%
20%
15%
10%
5%
0%
-5%
-10%
1960
2021
Agriculture forestry and fishing
Mining and quarrying
Manufacturing
Construction
Electricitygas water and waste
Trade restaurants and hotels
Transport and communications
Finance, real estate and business services
Other services