Intangible assets and the high profit rates on assets shown in the National Accounts

June 2024

New Zealand Association of Economists Annual Conference, Wellington

Bill Rosenberg[1]* and Geoff Bertram

Visiting Scholars, School of History, Philosophy and Political Science

Victoria University of Wellington

Abstract

The National Accounts in the U.S. and New Zealand show rising rates of operating surplus which we and other authors have suggested show rising economic rents: profits over and above those justified by cost of capital and risk in competitive conditions. An alternative explanation is that there are forms of intangible assets which are unrecognised in the National Accounts and that the above-warranted profit rates on assets recognised in the National Accounts are not economic rent but the warranted return on these unrecognised assets.

In this paper we update Bertram and Rosenberg (2022, 2023) to provide our latest estimates of economic rents in New Zealand. We then argue that the "recognition" of further intangibles as assets does not satisfactorily explain why profits are rising, other than that intangibles themselves tend to contribute to the generation of economic rent. We do this by describing the accounting for intangibles in income generation, including how the currently "unrecognised" intangible assets are valued and, crucially, how the proposed change in treatment impacts profits. Some valuation methods are circular in that they simply assume that all excess profit is a warranted return on (often unidentified) intangible assets. The costs of the "unrecognised" intangible assets are currently part of operating expenditure and the reconceptualization of this as investment in an asset means we must consider how this affects measured added value, profits and economic rent. We also consider the direct impact of intangibles themselves on rent.

Introduction

The National Accounts in the U.S. (e.g. Barkai, 2020), Switzerland (Baldi and Gourio 2018) and New Zealand (e.g. Bertram & Rosenberg, 2022, 2023), show rising rates of unexplained operating surplus since the 1980s , which those authors and others have suggested show rising economic rents: profits

[1] wj.rosenberg@gmail.com, and geoffbertram1@gmail.com

over and above the return on investment in fixed assets that could be justified by cost of capital and risk in competitive conditions.

An alternative explanation is that there are new forms of intangible assets which are unrecognised in the System of National Accounts ("SNA") (e.g. Corrado et al., 2022, p. 15ff), so that the apparent excess profits are not economic rent but just the warranted return on these unrecognised assets.

In this paper we argue that while the impact of intangibles on economic performance may well be worth discussing in its own right, their "recognition" as assets does not satisfactorily explain why economic surplus has risen sharply since the 1980s.

After sketching the history of how intangibles came to feature in explanations of income, profits, productivity and economic growth, we describe current efforts to measure types of intangibles which are not currently included in the System of National Accounts. We update Bertram and Rosenberg (2022, 2023) to provide our latest estimates of economic rents in New Zealand, measured as the residual remaining from the Gross Domestic Income paid out in market sectors of the economy once we subtract compensation of employees, mixed income of working proprietors[2], and a warranted return on all recorded Gross Fixed Capital Formation (GFCF) since 1949.

We then describe how intangibles are accounted for in income generation and how changes to account for previously "unrecognised" intangible assets impact on a restated cost of capital. Insofar as costs have actually been incurred by whichever parties are claimed to have acquired ownership of the newly recognised assets, and hence to possess the right to collect a return on them, those costs must previously have been recorded in the national accounts as part of operating expenditure This in turn means that reconceptualising that expenditure as investment in an asset will have to account for an increase in measured added value, depreciation, and total surplus. We find that once allowance is made for this in our calculations, unrecorded intangible investments do not explain the increase in economic rents which we and others have found. We also consider the direct impact of intangibles themselves on economic rent and wages.

Finally we briefly discuss the present moves to regard intangibles as assets and express caution.

The background

In a standard neoclassical explanation of income distribution on the basis of an aggregate two-factor production function, a fall in labour's share of output logically translates to an increase in the share of capital. The simple neoclassical story is that this should correspond to an increase in the warranted return on investment in fixed capital assets, calculated using the approach of Hall and Jorgenson (1967). This prediction has failed empirically, as numerous studies following the lead of Barkai (2016, 2020) have confirmed. But if the warranted return on capital has not increased, the observed increase in gross surplus requires a different explanation.

Karabarbounis and Neiman (2019 pp.167-8) describe the issue as follows

[2] Insofar as working proprietors secure rents, including returns on intangible assets that they may hold, those rents are additional to those estimated below, and are set aside here in order to focus entirely on the corporate market sector.

> A large wave of recent work has documented a decline in the labor share starting around 1980… this decline [has been] a global phenomenon, present within the majority of countries and industries around the world. Most analyses of the US data that we are aware of … show that imputed payments to capital do not rise sufficiently during this period to fully offset the measured decline in payments to labor. As a result, there is a significant amount of residual payments—or what we label "factorless income"—that, at least since the early 1980s, has been growing as a share of value added.

They identified three possible explanations (p.221): "economic profits, missing capital, or a gap between the return on risk-free bonds and the cost of capital that firms perceive when making their investment decisions". The first of these – a rise in economic profit (rents) – would indicate an increase in the market power of firms (what Kalecki (1938) called the "degree of monopoly"). The second – missing capital – could be unmeasured assets (including "intangibles") in the capital-stock statistics, resulting in underestimation of the true warranted return on capital. The third – mis-measurement of the true cost of capital – could involve "time-varying risk premia or financial frictions that generate a wedge between the imputed rental rate R using a Hall-Jorgenson formula and the rental rate that firms perceive when making their investment decisions" (Karabarbounis and Neiman 2019 p.168). Karabarbounis and Neiman consider the third of these to be the most promising, and are particularly sceptical of the second.

The same issue seen from a different angle is addressed by Farhi and Gourio (2019), who find evidence for all three explanations (p.147):

> Real risk-free interest rates have trended down over the past 30 years. Puzzlingly in light of this decline, (1) the return on private capital has remained stable or even increased, creating an increasing wedge with safe interest rates; (2) stock market valuation ratios have increased only moderately; (3) investment has been lackluster… We find that rising market power, rising unmeasured intangibles, and rising risk premia play a crucial role…

If unmeasured intangibles provide at best a weak explanation, it is possible that intangibles, whether measured assets or in some other form, are themselves creators of market power and economic rents. The market-power hypothesis has recently received empirical support from Kerspien and Madsen (2024) in a massive study covering 22 OECD economies (not including New Zealand) which found that

> increasing markups, as proxied by Tobin's *q*, explain 44% of the actual increase in the capital share, while the declining unionization has contributed 32% to the increase, and the *K*–*Y* ratio has hardly had any impact on factor shares. The time dummies account for 33% of the explained increase in the capital share, fractionally counterbalanced by the country-specific time trends (−9%). These deterministic time effects may have captured measurement errors of the nondeterministic variables, technological progress, aggregation errors, and other influences. Thus, in line with the findings for the United States, increasing markups have been influential not only for the declining labor share in the United States since the early 1980s, but also for the advanced countries in general.

This leaves only a minor role for unmeasured intangibles, as part of the "measurement errors" in the time dummies, but they could be part of the reason for increasing markups.

Other authors – for example O'Mahony et al (2021) in their 17-country study – have found evidence of intangible capital as a driver of markups or economic rent and the declining labour share. Sandström (2020) finds evidence of "a positive relationship between intangible capital and average industry markups", but inconclusive evidence of its relationship to economic profits. Crouzet and Eberly (2021, 2019) also find an association between intangibles and rising markups, and Crouzet, Eberly, Eisfeldt

and Papanikolaou (2022) discuss the finding "that rents associated with intangible assets have contributed to a sharply rising share in the growth of total enterprise value of U.S. businesses since the early 1990s".

Identification and Measurement

Intangibles can be defined as inputs to production which cannot be seen or touched[3]. They may be intermediate inputs to production which need constant replenishment, or assets in the sense that they are held for more than one period and contribute to the creation of value over multiple periods. The 2008 international standard for the System of National Accounts ("SNA2008") recognises as intangible assets "intellectual property products" including research and development (R&D); mineral exploration and evaluation; computer software and databases; and entertainment, literary or artistic originals (United Nations et al., 2009, p. 203). There are moves to extend this list.

The difference between current expenditure on inputs to production (intermediate inputs) and investment to install fixed assets is a key element in the argument that unmeasured intangible assets may explain above-warranted profits, because that argument requires reclassification of the former into the latter. The definitions of "investment" and "asset" are therefore particularly important, but in practice are vague in important ways. The Oxford Dictionary of Economics (Hashimzade et al., 2017) defines "assets" as "possessions of value, both real and financial", which is unhelpful in drawing the distinction. Closer to the sense in which "intangible asset" is used is the definition in SNA2008 (p.617), which emphasises that it creates a stream of future benefits as follows:

> An asset is a store of value representing a benefit or series of benefits accruing to the economic owner by holding or using the entity over a period of time. It is a means of carrying forward value from one accounting period to another.

Thus any expenditure which creates benefits to the economic owner over more than one accounting period is considered investment in an asset.

The vagueness is in what the "benefits" are. While they are normally thought of as being financial (a return on the asset value), benefits to the owners of a firm could also be (for example) acquiring or maintaining a dominant position in a product market, a monopsonic position with suppliers and employees, or the ability to externalise environmental or social costs.

In a seminal paper, Corrado, Hulten and Sichel (2005, p. 19) ("CHS") emphasise the intertemporal nature of investment, and argue that, whether tangible or intangible, "*any* use of resources that reduces current consumption in order to increase it in the future… qualifies as an investment" (their emphasis). From a theoretical optimal-growth intertemporal framework, they claim that this is true

[3] The Oxford Dictionary of Economics (Hashimzade et al., 2017) defines "intangible assets" as "Assets of an enterprise which cannot be seen or touched. This includes goodwill, patents, trademarks, and copyright. In the case of goodwill there is no documentary evidence of its existence. There is in all these cases evidence that intangible assets exist, as they are occasionally bought and sold, but there is no continuing market, and in their nature they are non-homogeneous, so that their valuation is very uncertain." However we do not confine intangibles to being only assets. See https://www.oxfordreference.com/view/10.1093/acref/9780198759430.001.0001/acref-9780198759430-e-1625

despite externalities, market power, and whether an asset is purchased or created within the firm ("self-constructed"):

> From a conceptual standpoint, it does not matter at all whether an asset is self-constructed or not, nor does the presence of externalities or market pricing power matter in the theoretical framework of figure 1.2: the intertemporal utility function is based on the final result of the production process—consumption. The consumption possibility frontier $\Phi(\cdot)$ incorporates all externality effects, monopolistic market structures, and self-constructed assets.

This is highly idealised: in practice it will be difficult or impossible to determine whether a specific intangible creates added consumption possibilities net of externalities, welfare losses due to monopolistic or monopsonistic behaviour, predatory or incompetent management, or other within-firm or external negative impacts, some of which may take years to show up.

If we consider the value added in a firm using the assets of interest, the benefit to the firm's owners – increasing their consumption possibilities – could come about by increasing total value added, with corresponding increases in income to both the firm's owners and its employees; or by reducing the proportion of value added paid to employees and increasing the income to the owners even if total value added falls or remains unchanged; or by taking advantage of scarce resources or a dominant market position to raise profit margins for the owners at the expense of consumers. While we are primarily dealing with gross income in this paper, a further way for the owners to increase their benefits is to reduce the taxes paid by the firm, reducing their contribution to the costs of public services, institutions and infrastructure. Externalising costs of production by, for example, polluting the surrounding environment also enables increased financial benefits to owners. The relevance of these scenarios to intangibles is that some intangibles may be explicitly designed to take advantage of opportunities such as these, which raise benefits to owners at the expense of others, rather than raising total welfare.

SNA2008 draws a distinction between "produced" and "non-produced" assets. The latter are "non-financial assets that have come into existence in ways other than through processes of production". They "consist of three categories: natural resources; contracts, leases and licences; and purchased good will and marketing assets" (United Nations et al., 2009, pp. 195–196). The second and third of these are intangibles. Contracts, leases and licences must be of a kind that change the price of the use of an asset or provision of a service, and include intellectual property rights. Thus many intangible assets (and by analogy other intangible inputs to production) are non-produced. The implication is that there are no costs to their production, hence no warranted rate of return, so any return is an economic rent. In a sale of the asset, the economic rent will be incorporated into its market value.

There is a further category of assets that, *to a given firm*, are non-produced and may be intangible and which could explain profits in excess of warranted returns. These are assets that are external to the firm which are often, though not always, beyond its control but impact the firm's productive capacity and the benefits it provides to its owners. They do not appear on a firm's balance sheet (though they may be commented on in a report to owners) and do not typically appear in economic models of a firm's production, but are sometimes acknowledged as "spillovers".

Corrado, Haskel, Jona-Lasinio and Iommi ("CHJI") (2022, fig. 3) include "Freely available basic knowledge" as part of their conceptual framework for production including intangible assets. This is

"generated (say) via public funds for basic scientific research to universities, [and] is assumed to be a free input in the upstream production function". Notably, "it receives no factor payments because its services are assumed to be freely available", implying any returns flow to the firms using such knowledge. But such external assets are much broader. They include institutions such as laws, regulations and the public agencies that maintain and enforce them, and the quality of the nation's education and health systems; the nature of the market in which the firm purchases inputs and sells its products, which could be in a range from highly competitive to highly concentrated; the infrastructure available to the firm such as roads, rail and telecommunications that is provided by the state or other firms; and the natural environment, whose importance is becoming increasingly clear as the impacts on production of climate change and previous despoliation of the environment make themselves felt.

In the context of the productivity slow-down CHJI (p.24) comment on the possibility that

> the potential for productivity spillovers to intangible investments is determined by an innovation ecosystem, including competition intensity and regulation, intellectual property rights and their enforcement, privacy laws, broadband access, and other factors.

At the same time, a greater proportion of assets that might be the source of spillovers and diffusion of knowledge – they point to datasets, certain formulas and software code – are protected as trade secrets, not disclosed and difficult to replicate, reducing productivity among other firms. "This changed composition of intangible investment then may also have led to scale economies within certain firms, like data agglomeration effects in digitally enabled firms, that tended to reduce competition in those markets." (CHJI, p.25) In other words, some forms of intangibles may create "winner takes all" forms of industrial structures.

While we do not analyse these external assets in any detail below, their importance in affecting the profitability of a firm when considering whether some unrecognised assets are at play should not be forgotten.

Taking into account both non-produced assets on the firm's balance sheet and assets external to the firm which impact its production, not all assets affecting the profitability of the firm justify a normal return to capital. A firm's above-normal profits may be due to it, for example, taking advantage of its control of a scarce asset, its fortuitous position in a limited market, its superior bargaining power over its workers or suppliers, or a plentiful supply of trained and educated workers or natural resources.

Intangibles in growth theory

Intangibles are closely related to the Solow residual in growth theory, referred to as multifactor or total factor productivity. The residual's ingredients are often thought of as including skills and knowhow of workers and management, and the advance of "technology" (which can be narrowly or broadly defined to include organisational or public institutional factors for example). These augment the identified labour and capital factors. Often however the mechanisms go unexplained – a "measure of ignorance" (Abramovitz, 1993).

Theorists of economic growth have increasingly shifted from models based on a production functions with just physical labour and capital, to models that emphasise intangible factors explaining growth differences among countries. As Jones and Romer (2010 p.224) state

> In contrast to Kaldor's facts, which revolved around a single state variable, physical capital, our updated facts force consideration of four far more interesting variables: ideas, institutions, population, and human capital.

Institutions have been central to the work of Acemoglu and his colleagues (Acemoglu 2009 Part VIII; Acemoglu and Robinson 2012); demography to the "unified growth theory" of Galor (2011) (cf Cervellati et al 2023); human capital and ideas to endogenous growth theory (Aghion and Howitt 1998). While there is general agreement that these intangible elements go far to explain different levels or output and productivity across nations, it is less clear how they get transformed from generalised productive contributions into privatised property rights to appropriate shares of the product. Of the four variables listed, human capital comes closest to being rival and exclusive to the individual, but much of that would be expected to be incorporated in wages and hence the share of labour, rather than the surplus. Ideas are inherently non-exclusive until protected by patents and other barriers to entry, which makes their private returns dependent upon institutions. There is thus an uneasy tension between the largely non-appropriable, collectively enjoyed, intangibles of modern growth theory and the rising private rentier claim on the surplus in practice.

Recent developments aimed at recognising new types of intangibles

The present interest in the capitalisation of intangibles is usefully outlined in CHJI, whose work we have already referenced. The authors (together with Hulten and Sichel quoted above) are leaders in advocating the recognition of new classes of intangible assets, describing methods for their measurement and incorporation in the SNA.

They start, as do Kerspien and Madsen (2024), from an observed and persistent gap between the market valuation and asset book value, including both tangible and measured intangible assets, of major firms (CHJI p.4ff). This could be explained either by missing assets, or by market valuations incorporating expectations of above-normal profits (economic rents). CHJI refer back to earlier efforts to treat research and development and brands as intangible assets, and to "the information technology-driven productivity 'boom' of the late 1990s". The last of these was also associated with a widening of the gap between market valuation and asset values. Research pointed to the importance of brand names, new products and intangible assets such as software-based procurement systems in many of the most successful companies. This led to a renewed interest in the possibility of "missing" assets in company and national accounts, and new efforts to measure them.

More recently, those interested in growth theory and competitiveness have been grappling with the puzzle of a slow down in productivity growth despite the huge growth in sophistication and use of information technology. Perhaps intangibles could help explain this. Brynjolfsson, Rock and Syverson (2021) suggest that the slow-down may be due to a "productivity J-curve" where the development phase of new unmeasured intangibles may lead to underestimation of productivity while the implementation phase may lead to overestimation – but in the event they find that "Intangibles, at least in the simplest formulation with a constant multiplier, do not explain the productivity slowdown, and actually somewhat deepen it" (p.358). We return to the "J-curve" concept later in this paper.

CHS laid out the framework which subsequent work on quantifying intangible capital, including CHIJ, has followed. It has been the basis for work in the OECD, European Commission and other statistical agencies including the Office for National Statistics in the U.K. Table 1, which reproduces Table 2 of

CHIJ, describes the forms of intangible capital which are currently measured and recognised in SNA2008 and those which they propose should be included.

Table 1: Broad categories of intangible capital proposed by Corrado, Hulten and Sichel (2005), and Corrado, Haskel, Jona-Lasinio and Iommi (2022, tbl. 2).

Broad category	Type of asset	SNA status
Digitised Information	Software	Currently in GDP (SNA2008)
	Databases	
Innovative Property	R&D	
	Mineral exploration	
	Artistic, entertainment, and literary originals	
	Attributed designs (industrial)	Proposed new intangible asset classes
	Financial product development	
Economic Competencies	Market research and branding	
	Operating models, platforms, supply chains and distribution networks (Organisational capital)	
	Employer-provided training	

Source: Based on Table 2 of CHJI

CHJI note that international accounting standards for firms are both internally inconsistent (disallowing self-constructed intangible assets but allowing purchased equivalents) and inconsistent with their SNA proposals. It is an issue that accounting standard setters have been grappling with for some time. For example, Picard and Bertelsen (2008) discuss the differences in treatment of advertising expenditure in the media industry between the International Accounting Standards Board (IASB) and the U.S. Financial Accounting Standards Board (FASB). Their different reasons are informative: "Where the IASB obliges to expense advertising costs because the intangible assets they are related to are not separable from the business as a whole (e.g. brand value or customer relationships), the Financial Accounting Standards Board (FASB) justifies the necessity to expense merely with the difficulties to measure the future economic benefits from advertising reliably." Both reasons are also important in considering the SNA treatment of intangibles.

Intangibles are frequently non-rival: they can be used by multiple firms at the same time. Knowledge spillovers are potentially large and may appear as "free inputs" (as previously discussed) to firms which have not produced or acquired them. Unless they are able to be protected (such as by secrecy or by intellectual property protection) their asset value to an individual firm is diminished. In addition they may not be appropriable – or only partially so: that is, it is questionable whether some can be separated from a firm and sold to others, which in turn means it is often impossible to establish a market value.

CHJI summarise the measurement problems as follows (p.17):

> First, it is often difficult to identify the investment flow, especially when intangible assets are co-produced along with primary products. Second, absent "arm's length" transactions in markets with prices, how can we calculate a price deflator for intangible assets, so that past investments can be expressed in real terms? Third, given that intangible assets lack "substance" (as financial accountants describe this asset class) how should we think of their capital consumption/economic depreciation? Finally, does partial appropriability provide a sufficient conceptual rationale for cumulating and aggregating real flows of intangible investment into capital stocks, as is typically done for tangible assets?

In practice then, followers of the method described by CHS value the "new intangibles" in the lower section of Table 1, in two ways. If they are purchased rather than produced within the firm, such as purchasing management advice or software products, the market value is used. If they are produced within the firm, which is common, the value is determined by the cost of the labour that has created them. It is assumed that, other than overheads related to the labour, there are few other costs: they are essentially pure labour. There may be inconsistencies in the valuation of similar products because of these different methods.

Before describing the valuation of the "new" self-produced intangible assets in more detail, it is worth observing that because of the difficulties in both identifying and valuing these assets, some other analysts take the simpler approach of treating them as an otherwise unexplained residual, either of asset values, or of returns to capital.

The intellectual property consultancy Ocean Tomo, for example, calculates the value of intangible assets "by subtracting net tangible asset value from market capitalization" of listed companies (Elsten & Hill, 2017; Ocean Tomo, 2022). It is therefore incorporating capitalised future flows of anticipated rents, irrational exuberance, impacts of interest rates and economic conditions into its valuations, and doing so without attempting to identify the actual intangible assets. For the U.S. it shows a rapid rise in this value as a proportion of S&P Market Value from 17% in 1975 to 32% in 1995 to 90% in 2020. However even using their methodology this is not typical. For the S&P Europe 350 the proportion of value is relatively flat at around 70%, and for Japan's Nikkei-225 Stock Average it has fallen from 52% in 2005 to 31% in 2015 and 32% in 2020. This could just as well reflect the frothy nature of the U.S. share market, compared to the stagnant Nikkei over the period.

In a similar vein, in an OECD paper by Alsamawi et al. (2020), returns to intangible capital are "any value added not explained by labour or tangible capital" – again, simply a residual. The paper does however acknowledge (p.10):

> However, it is important to note that this residual may include returns that are maybe not fully related to intangible capital. In particular, value added also reflects risk and rents related to market power, something that would be captured as other intangible capital with the residual approach.

Further, the returns are "affected by transfer pricing and by profit shifting strategies of firms". Notably, the paper finds that rents may be included in their measure of returns to intangible capital, but acknowledges that the method cannot identify the intangible assets involved.

Returning to the valuation of intangibles produced inside the firm using their labour cost, it is important to consider this method more closely. Martin (2019) details the methodology the U.K. Office

for National Statistics (ONS) uses, based on the methodologies of CHS and the OECD. This is valuable because it shows an official statistical agency grappling with the practical problems of incorporating these proposals in a way that is consistent with recognised statistical good practice and standards.

A "sum-of-costs" approach is applied to the labour costs. The costs include not only wages and salaries but associated costs such as employers' insurance and superannuation contributions. The ONS, following the OECD and Eurostat, also adds a "scale-up factor for non-labour costs (such as intermediate inputs, overheads, use of capital, and a mark-up for profits)". Notably the labour of working proprietors and governance boards does not appear to be included.

We will discuss some of the implications of this conversion of labour to investment in a subsequent section, but having established a labour cost there are three other matters to deal with.

Firstly, if labour costs are regarded as investment, then in order to accumulate the investment into assets over a period, a depreciation rate must be estimated. Martin acknowledges that this is difficult and uses "tentative indicators" in the paper. He concludes:

> In the main, however, evidence on appropriate depreciation rates for intangible assets is scarce, but these are crucial to assess whether net investment (gross investments minus depreciation) is positive, and thus the stock of intangible assets is increasing. Case studies and detailed data from businesses may be helpful in this regard.

Depreciation rates are assumed to be the same across all industries, even though it appears likely that they differ between industries and firms, and within an asset class. Each asset class contains many potential practices, each of which is likely to have a different effective lifetime, and firms with different characteristics may well make use of practices in different ways and in different proportions. Black and Lynch (2005, p. 219) observe that "High turnover could cause organisational capital to depreciate very quickly, whereas strong firm attachment could slow depreciation." Would the same expenditure on organisational capital in a small trucking firm depreciate at the same rate as in a large firm in a dynamic industry such as information technology? For some industries, some forms of intangible expenditure may not be investment at all. For example, Heiens et al. (2017) find "that neither advertising nor intangible assets [trademarks, copyrights, and licenses] have a positive and significant impact on holding period returns" in U.S. publicly traded foodservice retailers.

Corrado et al (2016, tbl. 1) provide estimates for geometric depreciation rates for the "new intangible assets" of Table 1 which are reproduced in Table 2 below.

These are very high depreciation rates. At 55% in Market research and branding, and in Organisational capital, they can barely be classed as assets, as they will have lost more than half of their value after the first year of life. Van Ark et al (2009, tbl. A1) suggest an even higher 60% for Advertising and Market research, but only 40% for Organisational capital. The EU-funded EUKLEMS & INTANProd database "assumes" similar rates as in Table 2 except for 40% for Organisational capital (Bontadini et al., 2023, p. 33). Given the uncertainty in these estimates and the variability between instances of such intangibles it is likely that some, perhaps many, will not last sufficiently long to be counted as assets – though this may not be obvious at the time they are created – and indeed may require some research to determine if they have any enduring ongoing owner benefits. If there were incentives to classify such intangibles as assets (if they were accepted for tax purposes for example) then gaming of expenses is likely to be a problem.

Table 2: Capitalisation factors and depreciation rates for the "new intangible assets".

Type of intangible asset	Depreciation rate
Attributed designs (industrial)	20%
Financial product development	20%
Market research and branding	55%
Operating models, platforms, supply chains and distribution networks (Organisational capital)	55%
Employer-provided training	40%

Source: Corrado et al (2016, tbl. 1)

Secondly, not all of the time spent by employees will be engaged in producing an intangible asset. They may spend time on other matters in the company or work on intangibles which do not have the characteristics of an asset. A "capitalisation factor" is applied to take account of this. For example a capitalisation factor of 50% signifies that only half of the time of the employees whose labour costs are counted is spent in producing the asset (that is, investment). In fact the factor is a multiplier of wage and salary costs rather than time. Again, these are difficult to estimate. Martin observes that there is a lack of time-use surveys that would help with this. For organisational capital he assumes only managers' time is relevant but finds only a small number of studies of managerial time-use (his Table 2) whose proportions cover a wide range. Instead he uses a range of possible scenarios (his Table 3) producing a range from 4% to 20% whose validity is impossible to judge. He uses a capitalisation factor of 20% following CDH who describe it as "admittedly arbitrary", although van Ark et al (2009, p. 88) assume only 16 percentage points of the 20 are investment while Corrado et al (2016, tbl. 1) assume 100%. We return to the matter of organisational capital below.

Thirdly, to calculate the real value of the assets, a price deflator for each type of intangible asset is required. Martin does not attempt to estimate these, concluding more work is needed:

> … all the estimates in this paper have been presented in current prices, as there is a dearth of suitable price indices covering intangible assets extending over a sufficiently long time period. Due to their nature, prices of intangible assets are difficult to measure. New assets are often customised or bespoke (especially when created in-house) and as such valuation can be difficult.

The EUKLEMS & INTANProd database (Bontadini et al., 2023, p. 31) has calculated a price index for investments in "Market research and brand" but mainly uses what it describes as "closely aligned services output deflators from national accounts".

It is notable that the maintenance and support of these new intangible assets is rarely discussed. It is possible that some take considerable ongoing effort. For example, a brand needs to be continually used, displayed and defended, and the consistency of the operations of the firm with the brand maintained, or it will "deteriorate", losing its value. It is entirely possible that the cost of maintenance and support exceeds the initial investment. This has been intensively studied for software

development, maintenance and support (for example, Koskinen et al., 2003) where it is not unusual to find estimates that 90% of a software product's lifetime costs are in maintenance and ongoing changes (for example, Dehaghani & Hajrahimi, 2013; Koskinen, 2015). It is not obvious how clearly this effort can be distinguished from investment, especially when some of it may be adding to existing assets.

A conclusion from these developments is that the valuation methodology still has a weak evidential base and is likely to be subject to large variations in valuations of investment and assets.

There are important issues raised by the use of the value of employees' labour to estimate asset values. This is best illustrated in two examples of the "new intangibles": Organisational capital and Employer-provided training.

Organisational Capital

Operational capital broadly encompasses how a firm is run, including how it is organised internally, its supply and distribution chains. It is well accepted that these matters have an impact on firm success.

Can Operational capital meet the definition of an asset if it exists primarily in the minds of the responsible personnel, who are free to leave at any time and who must be constantly updating their understanding of the situation and their responses to changes? While CHJI argue (p.12) that it is an asset because some firms have maintained their advantage despite the loss of key personnel and that those departing personnel do not necessarily repeat their success in other firms, that experience is by no means universal and raises the question: where does this asset reside and how can managers, investors, auditors or regulators assure themselves that it exists? They give as an example: "When Apple's founder and chief executive officer Steve Jobs passed away in 2011, the value of Apple did not disappear. Rather, a large part of his value was embodied in Apple itself." Yet Jobs had earlier departed Apple (in 1985) to form another computing firm, the NeXT Corporation. Apple struggled to continue its success in his absence and in 1997 bought NeXT, incorporated many of its ideas into its own development and brought Jobs back, first as an advisor, eventually as CEO. Clearly Jobs himself was a key to Apple's success.

This example also raises the concern that Organisational capital may actually be negative in terms of benefits to owners (not to mention other interested parties such as employees, customers and those affected if the firm creates environmental damage). Jobs' successor when he left in 1985 was John Sculley. Was the Organisational capital that Sculley brought to the company negative? This is not the same as the situation where, for example, a company purchases a proven piece of equipment which proves not to be successful in improving profitability. In this second case, the cause is not the asset that failed but the failure of the company to utilise the asset, or changing conditions in its markets. In the Sculley case, it is the failure of the asset itself, by design: it was known what kind of organisational approach Sculley would take, even if its effects could only be guessed at.

A current example is more stark. Useem (2024) describes the decline of Boeing following repeated failures of its aeroplanes, killing 346 people and severely undermining Boeing's reputation for quality engineering and safety. Undoubtedly the decline has not been of benefit to its owners, and likely is value destroying: reducing total value added, and welfare in the U.S. and elsewhere. Useem attributes this destruction to a changed organisational model:

> … the peculiar story of a plane maker that, over 25 years, slowly but very deliberately extracted itself from the business of making planes. For nearly 40 years the company built the 737 fuselage itself in the same plant that turned out its B-29 and B-52 bombers. In 2005 it sold this facility to a private-investment firm, keeping the axle grease at arm's length and notionally shifting risk, capital costs, and labor woes off its books onto its "supplier." Offloading, Boeing called it. Meanwhile the tail, landing gear, flight controls, and other essentials were outsourced to factories around the world owned by others, and shipped to Boeing for final assembly, turning the company that created the Jet Age into something akin to a glorified gluer-together of precast model-airplane kits.

In other examples, rather than create additional added value, organisational models redistribute added value in a way that favours owners and senior executives. Christensen et al (2011) state:

> When a CEO wants to boost corporate performance or jump-start long-term growth, the thought of acquiring another company can be extraordinarily seductive. Indeed, companies spend more than $2 trillion on acquisitions every year. Yet study after study puts the failure rate of mergers and acquisitions somewhere between 70% and 90%.

Acemoglu et al (2022) find that chief executives with a business degree (whom they refer to as "business managers") reduce their employees' wages in both the U.S. and Denmark, lowering labour's income share, and their firms have increased worker quits but do not have higher output, investment or employment growth following their appointment. Instead, "We establish that the proximate cause of these (relative) wage effects are changes in rent-sharing practices". They find also that chief executives with a business degree are no better than those without one in terms of productivity sales, employment or investment responses to export opportunities "thus no compelling evidence that business managers are more productive or adaptable in this context either". These effects remain after controlling for endogeneity effects (such as firms hiring such chief executives when they want to reduce labour costs).

New Zealand is recognised as having many weaknesses in its management skills. For example the New Zealand Productivity Commission (2021, pp. 151–152) reported that:

> A benchmarking study of management practices in New Zealand manufacturing firms found that New Zealand firms have relatively poor management practices compared to their international counterparts, with HR management an area of particular weakness (Green & Agarwal, 2010). Lack of management resources was the second most significant barrier to innovation reported by firms in the 2019 Business Operations Survey.

There is evidence from New Zealand, as elsewhere, that significant management effort is not directed towards, or effective in, raising productivity or value (e.g. Acemoglu et al., 2022; Bebchuk et al., 2011; Hazledine, 2015; Roberts, 2005).

Thus we see that the quality of the investment is not addressed by these valuation methods. This contrasts with assets which are sold in a competitive market where experience of their quality should be built into the price they can fetch. There is no substitute in these proposed methods.

While not our focus here, a similar problem occurs in the Financial product development form of new intangible assets. For example, some financial products are designed to enable tax minimization, avoidance or evasion, not to create economic value.

The above examples attribute the creation (or destruction) of organisational capability to senior managers or even solely chief executives. The proposed accounting method for Organisational capital

implies that the more managers a firm has, the stronger its Organisational capital will be. But as Martin points out: "It is first worth examining whether only managers create organisational capital." He finds evidence that other professions are involved in its creation, and in one study that on headcount, managers account for only around three-quarters of all organisational workers (p.R23).

There is a contrasting approach represented by Black and Lynch (1997, 2005). They "divide organizational capital into three broad components—workforce training, employee voice, and work design" (2005, p.206) which are linked and mutually supportive. By "employee voice" they mean

> those organizational structures that give workers, especially nonmanagerial workers, input into the decision making associated with the design of the production process and greater autonomy and discretion in the structure of their work. Traditional forms of work organization are very task specific; each production worker has a specific task to complete, and once they learn how to accomplish the task, there is little independent thought involved. However, newer forms of organization involve giving employees, specifically lower-level production workers, more input into the production process and greater opportunities to improve efficiency. As employee voice increases, firms are better able to tap into the knowledge of nonmanagerial workers.

They report that there is "a large continuum of practices associated with employee voice" and provide evidence of the impact of workplace practices on productivity. They point out the risk of relying only on management responses to surveys, and suggest a more sophisticated survey-based approach to measurement of Organisational capital that incorporates their three components.

The implications of this are important. Most obviously, to count only managerial time as investment in Organisational capital is incorrect. It is taking a particular view of the dynamics, knowledge and power relationships in the workplace. CHJI partly acknowledge the importance of such relationships when they state (p.12): "The issue boils down to ownership of (or command of) the insights and intellectual property the managers and others are paid to develop".

If employees are enabled and encouraged to use their own skills, generic knowledge and, crucially, their first-hand knowledge of the reality of the work they are engaged in, they can contribute substantially to investment in Organisational capital. Of course if the organisation's practices are based on "top-down" control, allowing little or no employee voice, then the accounting is closer to reality, but it reflects an inefficient form of organisation which wastes resources available to it. It also omits "what matters": whether or not Black and Lynch's components are accepted as the correct areas for focus, there is much more to Organisational capital than managers spending time on it. The form of it matters. More subtly than the accounting, Black and Lynch's approach demonstrates a reality that workers contribute to the productivity of the production process, their contribution is to some extent discretionary, and the recognition of their contribution in their pay and conditions may or may not reflect this. This is material to the issues of the share of income between employees and the owners of capital, and to the extent and sharing of economic rents. This connection becomes more obvious as we turn to Employer-provided training.

We conclude that the proposed accounting for investment in Organisational capital ignores the quality of the capital, and is therefore likely to wrongly classify or value some expenditure as investment, even when the result is value-destroying. It oversimplifies the process of creating Organisational capital in a way that reflects and embeds the sharing of income and economic rents under conditions

of unequal bargaining power between employees and employers. There is still a high degree of uncertainty in estimates of the level of investment and Organisational capital itself.

Employer-provided training

A distinction is drawn between training that is specific to the firm and that which is described as "generic". "Generic" in this context does not exclude training in specialist areas – it simply means anything that is not firm-specific. The difference is identified by who pays for it: it is assumed that it is the firm which pays in the former case and the employee (perhaps together with the state) in the latter.

The reason for the difference is explained by CHJI (p.13):

> … studies demonstrate that firm-specific training (like the apprenticeships discussed in Zwick 2007) generates net returns to the firm, over and above the costs of the training and additional wages paid to employees with enhanced skills.

The same authors went further in an earlier paper (Corrado et al., 2012, p. 27):

> If [training] forms general human capital, then the returns accrue to workers, i.e., the returns are priced into wages and reflected in the marginal product weighting of labor input that appears as the labor composition term in empirical growth accounting analysis.
>
> If training creates firm-specific human capital, however, the returns are not fully reflected in wages. Rather, the firm captures rents, and these will feature as payments to intangible capital.

The approach *assumes* that all the benefits of generic training are recognised in wages, which requires heroic assumptions as to the existence of a perfect labour market between employers and employees. We will not dwell on this other than to say that there is a wealth of evidence against it. In the case of rewards to training, several New Zealand studies show no or very limited recognition in pay rates of further vocational training ("generic" in the current context) undertaken by employees, though greater recognition for degree-level education (e.g. Crichton, 2009; Crichton & Dixon, 2011; Tumen et al., 2015, 2018; Zuccollo et al., 2013).

However their assertion regarding firm-specific training is revealing: "the returns are not fully reflected in wages. Rather, the firm captures rents, and these will feature as payments to intangible capital." As we described when discussing the involvement of non-managerial employees in creating Organisational capital, the dynamics and power relationships in the workplace determine who captures rents and benefits from them. Implicit in the quoted statement is that at least some of the returns to intangible capital are the result of their extraction from employees. By "rents" the authors are presumably referring to the fact that employees, by their possession of firm-specific knowledge, have a scarce resource from which rents can be extracted. It is not automatic that these rents should become the property of the firm: chief executives and employees with scarce but essential "generic" skills (i.e. skills of interest to other firms) are often able to share the rents in their pay and conditions of employment.

The investment represented by firm-specific training is estimated by the cost of training (including both external and internal trainers) and the opportunity cost resulting from employees taking time away from production to undertake the training. For example, Bontadini et al (2023, p. 29) describe

the EUKLEMS and INTANProd estimation approach for U.S. investment as capturing formal training via "(a) purchases of training services, (b) the in-house cost of providing training services (wages of training personnel and materials used), and (c) the opportunity cost in terms of hourly wages paid for employee time spent in training functions". For Europe it is estimated by the sum of investment in vocational training and apprenticeships. Sourcing good quality data is reported as a significant problem by both them and Martin.

Clearly this omits informal training such as learning-by-doing and the formal or informal mentoring that occurs when a new employee starts a job or is about to undertake a new aspect of the job. Again, the contribution of non-managerial employees is not recognised.

We conclude this section by noting, as described above, that some studies such as O'Mahony et al (2021), Farhi and Gourio (2019) and Karabarbounis and Neiman (2019) have directly tested the assertion that unmeasured intangible assets can explain the growing gap between warranted returns on recorded assets and operating surplus, but with no consensus emerging in favour of the intangibles explanation.

Chappell and Jaffe (2018) is possibly the only research that considers the economic impact of intangibles in New Zealand. They attempted to investigate the impacts of intangible capital but had very poor measures of it, limited largely to firm reports as to whether expenditure had occurred or not. They found no impact on productivity or profitability. While the test was weak, it is consistent with unmeasured intangible assets not playing a major role, if any, in generating profits in New Zealand. This would also be consistent with weak firm performance in New Zealand generally.

As we note below, Barkai (2020) tests whether the new intangibles could explain the pure profits he finds, and concludes they would make little difference.

Economic rents in New Zealand – an update

In papers presented to the 2020 and 2023 NZAE conferences we replicated the approach of Barkai (2020) and Karabarbounis and Neiman (2019), using the model from Hall and Jorgenson (1967) to estimate a warranted return on capital for the period 1950-2022. We found the familiar result of falling shares for both labour and capital since the 1980s, leaving a growing residual that has been variously called factorless income, pure profit, and economic rent. In Bertram and Rosenberg (2023) we focused the analysis on fully-corporate market activities by separating out owner-occupied property, non-market activity, and the self-employed (the last of these accounts for roughly 20% both of GDP and of Gross Surplus and Mixed Income of market sectors excluding owner-occupied property). Figures 1 and 2 below trace the resulting decomposition of market-sector Gross Surplus and Mixed Income excluding owner-occupied property, amongst the self-employed, warranted return and residual economic rent. Figure 1 is in dollar terms at 2024 prices (using the CPI as deflator); and Figure 2 shows percentages of adjusted[4] market GDI. Any economic rents accruing to working proprietors, including on land and intangible assets that they may hold, are additional to the rents in the figures which are limited to those of the corporate market sector.

Two points emerging from this analysis are, first, that the economic rent residual appears to have grown rapidly in recent years to the point where, as of 2022, it accounted for $38 billion or 12% of

[4] Adjusted by exclusion of owner-occupied property.

adjusted market GDI; and second that the warranted-return calculation produces a spike in the 1980s and 1990s which, although it may be driven partly by unproductive capital investment in the "Think Big" era (as suggested in Bertram and Rosenberg 2022), may also represent a flaw in the Hall-Jorgenson formula for the cost of capital under inflationary conditions – as is argued by Karabarbounis and Neiman (2019) who observed a similar spike in their US results.

Figure 1

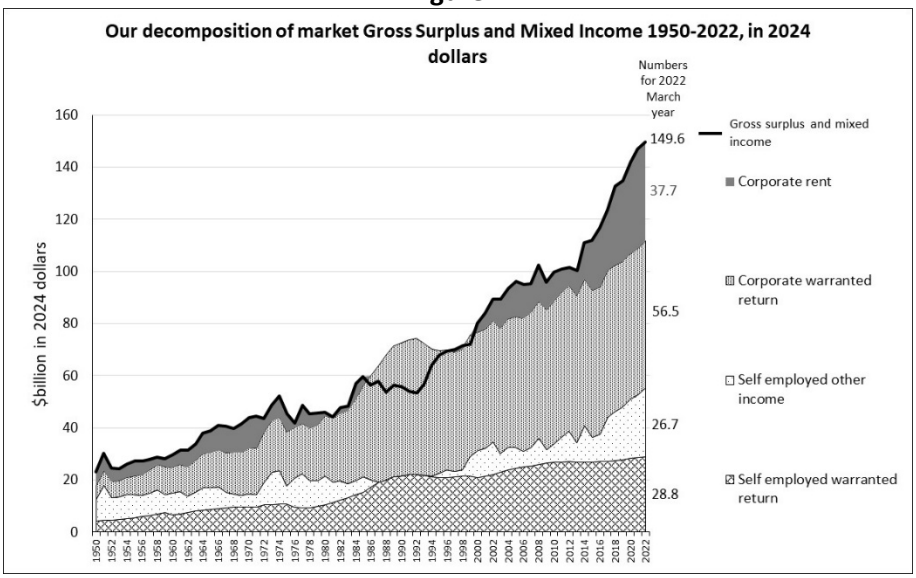
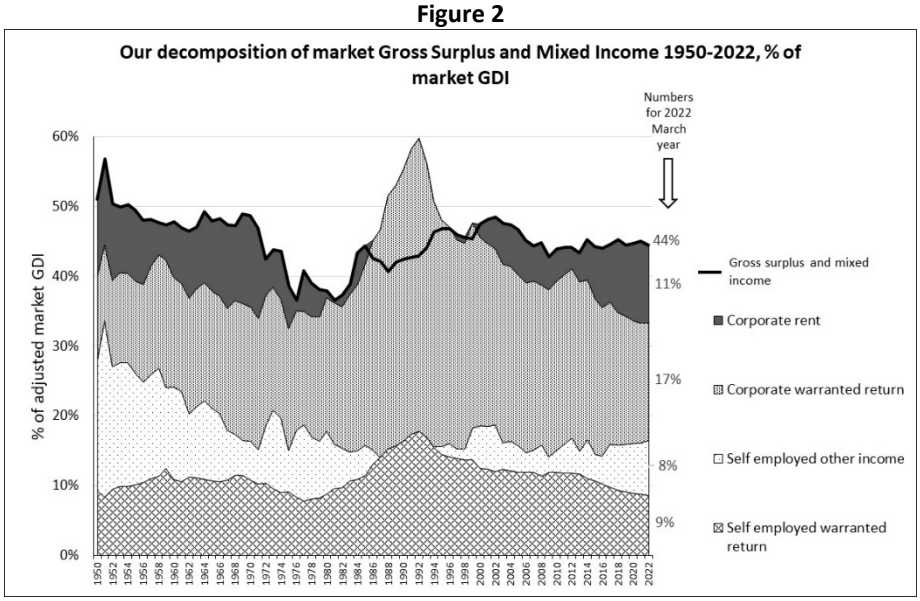


Figure 2



Are the high rents we find explained by unrecognised intangible assets?

Suppose that "new", unrecognised, intangible assets exist in New Zealand firms and are at least part of the reason for the apparent economic rents we have calculated. In the absence of information on their content or historic value it is not possible to calculate the warranted return on them.

However we can carry out a sensitivity test. It is based on the observation that to recognise the "new" intangible assets, some of the expenditure currently classified as the cost of intermediate inputs, overheads or labour would conceptually (see below) need to be reclassified as investment in

intangibles: that is, gross fixed capital formation (GFCF). These costs could include, for example, bought-in innovation either embedded in physical assets or in consultancies, and wages for the labour devoted to creating intangible assets within a firm. 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 added value calculation, while the revenue from outputs would reduce by depreciation of the newly recognised assets. Assuming Compensation of Employees (COE) is unchanged, measured operating surplus (profit) would by definition change in lock step with added value. If depreciation on the newly recognised assets is less than the new GFCF then added value and profit increase in tandem, and if the depreciation is more than the GFCF, added value and profit fall in tandem. Insofar as GFCF must be greater than depreciation to maintain the asset base, both added value and gross surplus can be expected to increase. Excess profits will only reduce if the GFCF in the new intangibles is less than the warranted return on the stock of new intangibles. Timing issues of course affect the result from year to year.

In practice, in the SNA, when labour compensation is part of the cost of creating the asset, COE is unchanged but gross output is increased by the relevant labour compensation to recognise the creation of the asset, and that cost is then capitalised. Crouzet, Eberly, Eisfeldt and Papanikolaou (2022, p. 43ff) criticise this treatment on the grounds that some of the increased profit should actually be accruing to labour and that it therefore exaggerates the return to capital. We have discussed this in reference to Organisational capital and Employer-provided training.

In our model, we can simulate this change to recognise "new" intangible assets by increasing intangible GFCF and Gross Operating Surplus by the same amount, and allowing the results to flow through. If we double intangible GFCF, 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) for the corporate market sector, excluding self-employed and owner-occupied property, in 2021 are virtually unchanged at $38.5 billion (compared to $38.2 billion) while warranted return increases from $56.2 billion to $64.0 billion.

Crouzet et al (2022, fig. 1) assert that the value of intangible assets, when unrecognised ones are included, rose rapidly in the 1990s and early 2000s in U.S. 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) in our model, which makes it approximately equal to GFCF in tangible assets in New Zealand over the last decade, economic rent is barely changed at $39 billion in 2021 while warranted returns increase to $79.8 billion.

We can conclude that our dollar estimates of economic 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 in the denominator.

Barkai (on whose methodology our research is based) comes to a similar conclusion. He tests the robustness of his findings by incorporating intangible capital values from the INTAN-Invest database (Barkai, 2020: see particularly section IV.C, starting on p.2438). He finds that adding the new assets "accounts for pure profits that are on average equal to 0.3% of gross value added and that never exceed 1.52% of gross value added." He describes this as having "modest effects on the level of pure

profits." He then tests a scenario approach and concludes that the inclusion of intangibles doesn't change his story.

Formalising the model

The above discussion can be formalised as follows.

The national-accounts income identity for a given year is stated in equation (1):[5]

$$Y \equiv W + rK + \pi \equiv GO - IC \qquad (1)$$

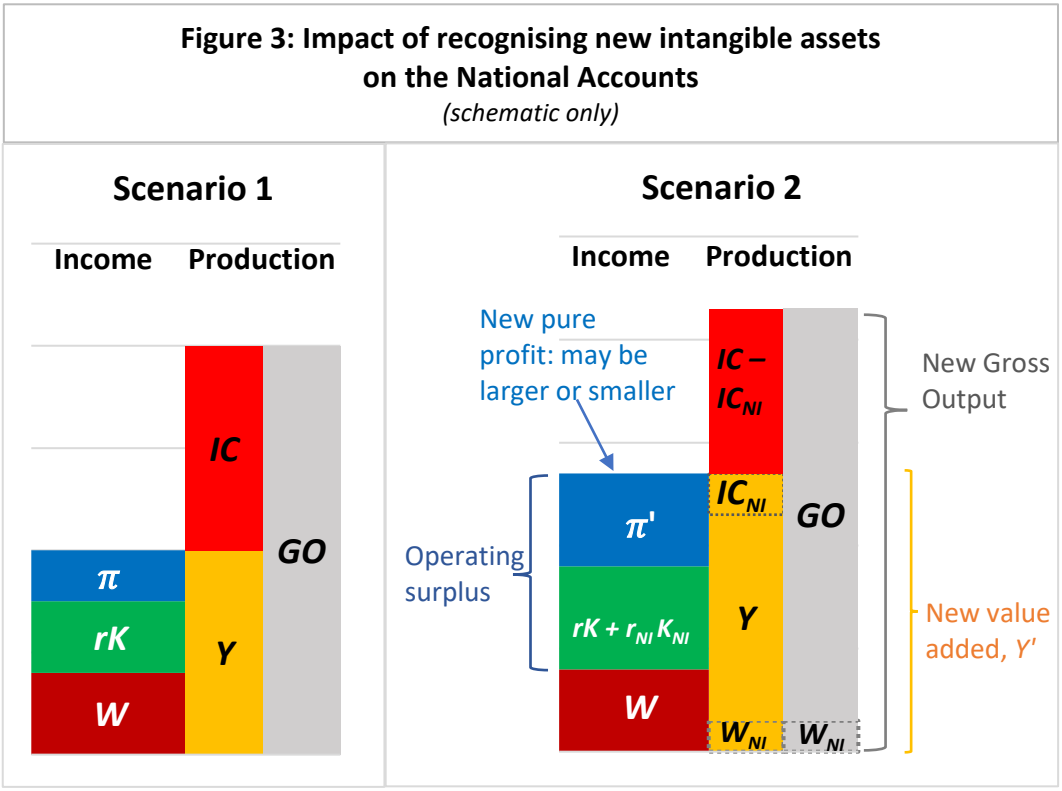
Here gross total income *Y* is equal to the total income paid to labour, *W*, plus the warranted return to capital (equal to the warranted rate of return, *r* multiplied by the stock of capital *K*) plus any additional economic rent π. *Y* is also equal to gross output *GO* less intermediate consumption *IC* (costs other than labour) – in other words, added value.

This implies that economic rent is as stated in equation (2).

$$\pi = GO - IC - W - rK \qquad (2)$$

We describe this status quo situation as Scenario 1. It is illustrated schematically in Figure 3 below.

Figure 3: Impact of recognising new intangible assets on the National Accounts
(schematic only)



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 assets, the current unreported stock of which is K_{NI}, on

[5] Note that the System of National Accounts counterpart to this identity combines $rK + \pi$ into Operating Surplus, and includes taxes on production and imports less subsidies as an additional item. Without loss of generality and to simplify the discussion we can put taxes on production less subsidies aside and work in factor prices.

which the warranted return is $r_{NI}K_{NI}$. This is Scenario 2. With these changes made, the national accounts identity becomes

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

$$\Rightarrow \quad \pi' \equiv GO - (IC - IC_{NI}) - (W - W_{NI}) - rK - r_{NI}K_{NI} \qquad (3)$$

What has happened here is that the total wage bill actually paid, *W*, remains the same because the number of employees and their pay rates remain unchanged, but the part of it that is now considered as capital formation, W_{NI} , is added to gross output to reflect the production of new assets. At the same time the amount of intermediate consumption that is reclassified as 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.

Subtracting (2) from (3),

$$\pi' - \pi = (IC_{NI} + W_{NI}) - r_{NI}K_{NI} = GFCF_{NI} - r_{NI}K_{NI} \qquad (4)$$

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 but "hidden" produced intangible assets (the new intangibles)</u>. If, as CHJI suggest, investment in new intangibles is rising rapidly, and if the assets have high depreciation rates, investment may well exceed the warranted return on the existing assets, increasing rather than reducing the measured Barkai rents.

While it is clear that adjusting for new intangible capital will increase gross operating surplus, the effect on net operating surplus is indeterminate. If the rate of depreciation (or in National Accounts terms, Consumption of Fixed Capital) is δ, 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. If investment is to cover depreciation in order to maintain productive capacity then the change will be non-negative.

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?

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

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

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

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 (4)) 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.[6] This is similar to the "J curve" described by Brynjolfsson et al (2021).

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 (see Table 1) – designs, financial products market research and branding, organisational capital, and employer-provided training – have costs throughout their lifetimes, mainly in the wages and salaries of the employees involved plus perhaps some contracted-in content, and require continuity of funding for both ongoing development and maintenance. Industrial design may require regular updating and at times major changes and again is heavy in labour costs. Unless the firm continues to "reinvest" through its expenditure on the intangibles, which is largely in labour and its skills and knowledge, the "asset" will quickly disappear. It must be maintained in existing staff or passed on to other staff or, where feasible, be embedded in tangible assets such as plant and equipment or in software.

Economic rents could appear lower, the same or higher during the asset 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.

Nevertheless, the recognition of newly-identified intangibles as assets does increase gross operating surplus and Gross Domestic Income by exactly the same amount, thereby lowering the labour income

[6] 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)

share of Gross Domestic Income. While this is at one level simply an accounting change accomplished by converting expenses to GFCF, 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.

The main outcome of "recognising" intangibles as assets is to assert ownership by the firm of the increased surplus flowing from the assets. In the mechanical accounting change described above, it increases profits in the form of warranted return on the investment while it may reduce the apparent rate of return in economic rents because the asset base has increased. This may deflect the attention of employees who might well argue the rent should be shared with them, and of competition authorities and the public, who might argue for regulation, higher taxation or other interventions.

Crouzet, Eberly, Eisfeldt and Papanikolaou (2022, p. 43ff) assert that some of the increased surplus due to intangible assets should actually be accruing to labour and that therefore the true return to capital is overstated. We agree that some of the returns from intangibles should accrue to labour, but the evidence in the National Accounts (and elsewhere) is that it does not, but adds to firm profits. The reality is that the income stays with the owners of capital and as CHJI suggest, this is economic rent which the firm captures from employees. (At any rate, in New Zealand at least, all labour compensation-like payments to employees, including bonuses or share options are included in COE according to Statistics New Zealand (personal communication, Hamish Grant, 7 October 2022).)

Demmou and colleagues in the OECD (e.g. Demmou et al., 2020; Demmou & Franco, 2021) review and add to evidence that intangibles increase productivity (though many of the studies reviewed focus on R&D and other intangibles already recognised in the National Accounts). It would be a surprise if better management and strategy, more highly trained staff, and so on did not lead to better results, but the results would be achieved whether or not such practices were recognised as assets. Their argument for bringing intangibles into the recorded capital stock is less one of principle and rather a pragmatic one – that because certain intangibles are not recognised as assets, they are not as readily financed and there is therefore a productivity loss because insufficient investment is made into these assets. Skinner (2008) however disputes that intangibles are insufficiently financed.

We conclude that "missing intangible assets" does not provide a convincing explanation of rising rents, and is not obviously more informative than simply recognising that some kinds of activity funded through the operating account may well have spillover effects that increase firm output and profitability and possibly economic rents, reflected in higher total factor productivity. There would then be no mysterious unrecognised assets producing additional revenue and profits. Instead the key question would be: do some of these activities add to economic rents?

Discussion to this point has dealt only with produced intangible assets. To the extent that economic activity gives rise to non-produced intangibles – recalling for example that SNA2008 considers some marketing assets as non-produced – economic rents will be generated in addition to the warranted returns and economic rents derived from the produced intangibles.

Intangibles as creators of economic rents

It might be expected that intangible activities would often lead to increases in rents. Many involve the development of protected intellectual property such as patents, trademarks, brands and designs, which confer a monopoly on their owner, at least temporarily, or provide sufficient differentiation of their products to create a situation of monopolistic competition.

A significant proportion of business strategising ("Organisational capital") is likely to have the objective of obtaining a dominant position in the market for products or supplies, or of suppressing wage and salary costs using the firm's monopsony position as an employer (e.g. Acemoglu et al., 2022; Manning, 2003), or of enabling management to appropriate for itself a proportion of rent that would otherwise accrue to the firm's owners. Bao, De Loecker and Eeckhout (2022) found that on average in 2019, 48.8% of manager pay could be attributed to market power, and since 1994 has accounted for 57.8% of growth; for top managers 80.3% of their pay was due to market power.

Bajgar, Criscuolo and Timmis (2021) use the extended set of intangibles in the INTAN-Invest database to study the relationship between intangibles and industry concentration. They find that

> Rising concentration is strongly associated with intensive investment in intangibles, particularly innovative assets, software, and data. This relationship appears to be stronger in more globalised and digital intensive industries. The results are consistent with intangibles disproportionately benefiting large firms and enabling them to scale up and increase market shares.

Crouzet and Eberly (2021, 2019) find an association between intangibles and rising markups, and Crouzet, Eberly, Eisfeldt and Papanikolaou (2022) discuss the finding "that rents associated with intangible assets have contributed to a sharply rising share in the growth of total enterprise value of U.S. businesses since the early 1990s", and the tendency of greater intangible intensity to increase market concentration. Syverson (2019) provides a wider discussion of market power, including Barkai's findings. He summarises work by Gutiérrez and Philippon, and Crouzet and Eberly (2019), writing (p.16): "Intangibles need not just be associated with (or caused by) concentration; they can causally affect industry concentration." Syverson argues that increased concentration may in some circumstances reflect greater competition and be efficiency-enhancing, but even where this is true, it is hard to imagine why firms which have a dominant position in the market would not make use of it, unless there is effective regulation to prevent that from happening.

Less discussed is the reverse causality: that market concentration could create intangibles – or what might be (mis)identified as them. The possession of market power through the ownership of a scarce asset or dominance in a product or buyers' market could be described as creating an intangible asset which raises current and future profits. In effect, the market concentration is the intangible asset. It might be identified as management expertise or organisational strategy, but where the market power is gifted by the nature of the market or the scarcity of certain (say) tangible assets then such a characterisation is little more than management self-justification and hubris.

A further category of new intangibles is financial product development. While many financial products have productive uses, this class presumably also includes the elaborate structures developed to avoid or evade taxes within a jurisdiction or to transfer prices to reduce tax liability by making use of different jurisdictions.

Some of this intangible activity may therefore enhance the profitability of a particular firm but at the expense of other firms, consumers or citizens in higher prices, inferior products, or reduced government revenue for public services. While it may produce future income for the owner of the asset, that may not be true in aggregate.

It is also worth observing that if intangibles are particularly likely to be associated with lower competition then we should treat with caution productivity research (such as Demmou et al., 2020; Demmou & Franco, 2021) which uses revenue as a proxy for output. This is common because of difficulties in measuring real output at a firm level, but it may overestimate output because it conflates raised markups with the competitive price of products.

The recognition of additional intangible assets in the National Accounts

As we have observed, there is advocacy for the new intangible asset classes to be recognised in the SNA. The OECD and EU are studying these matters and are beginning to include these assets in their reporting on an experimental basis, as are some national official statistics agencies such as the Office for National Statistics in the U.K. There is a current review of SNA2008 in the United Nations and the proposals for change include recognition of data and of marketing assets as produced assets (SNA 2008 Update Project Team, 2023).

We suggest there should be considerable caution about these moves. As we have indicated, there are major conceptual matters and practical issues of measurement that remain unresolved. These could have a significant impact on our understanding of topics such as the subjects of this paper – competition, distribution of income, and the results of power imbalances in society. While intangibles are important, it is crucial that we fully understand the full implications of reclassifying some of them as assets, and of the ways they are measured.

Conclusion

While greater understanding of the role of intangibles such as research, development, intellectual property protection and management expertise, has its own merits and is not new, our analysis shows that unrecognised intangible assets do not provide an alternative explanation of the increasing gap between income to the owners of capital and the warranted rate of return on the assets they own, which we suggest shows rising economic rents. Rising economic rents remain a concern. In fact the increasing volume and importance of intangibles may itself be an explanation for why economic rents are increasing: there is an tendency for them to, intentionally or otherwise, increase markups and economic rents.

There is pressure to treat several classes of intangibles as assets, and to incorporate them in official statistics. If classifying them as assets were accepted, the literature demonstrates significant problems in measuring both investment and asset values and quantities. This is for both practical and conceptual reasons. Measurement is being attempted by capitalising the value of the labour required to create the investment. Even if that were a satisfactory approach conceptually, there are still major problems determining critical parameters including depreciation rates, price indexes for the assets and the proportion of labour value that is devoted to creating the investment. But the approach ignores the contribution of employees to creating investment and accepts the capture by employers of that part of the created value and any economic rents. This has obvious distributional implications but also

accepts management approaches which are exploitative in that they disregard the contributions that employees make – or are able to make in the right organisational environment – to improvements in productivity. We caution against progressing this change to official statistics until the concepts are better understood and widely accepted, and the measurement issues have been resolved.

The methodology also ignores the existence of non-produced assets such as land, minerals, licences and the existence of scarcity. Because they are non-produced there is no warranted return due to them and all income from them, which can be large, is economic rent. Similarly, the influence of assets, both tangible (such as public physical infrastructure) and intangible (such as institutions, regulatory systems, and publicly available research) external to a particular firm or industry are not fully dealt with. They may, for example, create rent-making opportunities for a firm.

Whether intangibles are treated as assets or operational expenditure makes little difference from a production point of view, other than to point out that there may be a market failure in financing firms which are making effective use of intangibles. However treating intangibles as assets implies an increased share of income to the owners of capital.

References:

Abramovitz, M. (1993). The Search for the Sources of Growth: Areas of Ignorance, Old and New. The Journal of Economic History, 53(2), 217–243. JSTOR.

Acemoglu, D., (2009). *Introduction to Modern Economic Growth*. Princeton University Press.

Acemoglu, D., He, A., & le Maire, D. (2022). Eclipse of Rent-Sharing: The Effects of Managers' Business Education on Wages and the Labor Share in the U.S. and Denmark (Working Paper 29874; Working Papers). National Bureau of Economic Research. http://www.nber.org/papers/w29874

Acemoglu, D. and J. Robinson (2012). *Why Nations Fail: the origins of power, prosperity and poverty.* New York: Random House.

Aghion, P. and P. Howitt (1998). *Endogenous Growth Theory*. MIT Press.

Alsamawi, A., Cadestin, C., Jaax, A., Guilhoto, J. J. M., Miroudot, S., & Zürcher, C. (2020). Returns to intangible capital in global value chains: New evidence on trends and policy determinants (Policy Paper 240; OECD Trade Policy Papers). OECD. https://www.oecd.org/publications/returns-to-intangible-capital-in-global-value-chains-4cd06f19-en.htm

Bajgar, M., Criscuolo, C., & Timmis, J. (2021). Intangibles and industry concentration: Supersize me (OECD Science, Technology and Industry Working Papers 2021/12). OECD Publishing. https://doi.org/10.1787/ce813aa5-en

Baldi, G. and M. Pons (2019). The Evolution of Factor Shares: Evidence from Switzerland. MPRA paper 92408, February

Bao, R., De Loecker, J., & Eeckhout, J. (2022). Are Managers Paid for Market Power? (Working Paper 29918; NBER Working Papers). National Bureau of Economic Research. https://doi.org/10.3386/w29918

Barkai, S. (2020). Declining Labor and Capital Shares. The Journal of Finance, 75(5), 2421–2463. https://doi.org/10.1111/jofi.12909

Barkai, S. (2016). Declining labor and capital shares. New Working Paper Series No 2, Stigler Center for the Study of the Economy and the State, University of Chicago, November.

Bebchuk, L. A., Cremers, K. J. M., & Peyer, U. C. (2011). The CEO pay slice. Journal of Financial Economics, 102(1), 199–221. https://doi.org/10.1016/j.jfineco.2011.05.006

Bertram, G., & Rosenberg, B. (2022, June). How policy and institutions affect the shares of wages, profit, and rent in New Zealand. Annual Conference of the New Zealand Association of Economists 2022, Wellington, New Zealand. https://www.nzaeconference.co.nz/_files/ugd/623971_cd386c1f2ce348d19541bf60d91b9ada.pdf

Bertram, G., & Rosenberg, B. (2023, June). Economic rents in industry sectors in New Zealand. Annual Conference of the New Zealand Association of Economists, Auckland, New Zealand. https://62397185-821a-4cdf-b4f7-8cc2999495c6.usrfiles.com/ugd/623971_2574103cb94b497780e49dee39e3e76e.pdf

Black, S. E., & Lynch, L. M. (1997). How to Compete: The Impact of Workplace Practices and Information Technology on Productivity (Working Paper 6120). National Bureau of Economic Research. https://doi.org/10.3386/w6120

Black, S. E., & Lynch, L. M. (2005). Measuring organizational capital in the new economy. In Measuring Capital in the New Economy (pp. 11–46). University of Chicago Press. https://ebookcentral.proquest.com/lib/vuw/reader.action?pq-origsite=primo&ppg=216&docID=432153

Bontadini, F., Corrado, C., Haskel, J., Iommi, M., & Jona-Lasinio, C. (2023). EUKLEMS & INTANProd: Industry productivity accounts with intangibles. Sources of growth and productivity trends: Methods and main measurement challenges (D2.3.1). LUISS Lab of European Economics. https://euklems-intanprod-llee.luiss.it/wp-content/uploads/2023/02/EUKLEMS_INTANProd_D2.3.1.pdf

Brynjolfsson, E., Rock, D., & Syverson, C. (2021). The Productivity J-Curve: How Intangibles Complement General Purpose Technologies. American Economic Journal: Macroeconomics, 13(1), 333–372. https://doi.org/10.1257/mac.20180386

Cervellati, M., G. Meyerheim and U. Sunde (2023). The empirics of economic growth over time and across nations: a unified growth perspective. *Journal of Economic Growth* 28(2), 173-224.

Chappell, N., & Jaffe, A. (2018). Intangible Investment and Firm Performance. Review of Industrial Organization, 52(4), 509–559. https://doi.org/10.1007/s11151-018-9629-9

Christensen, C. M., Alton, R., Rising, C., & Waldeck, A. (2011). The Big Idea: The New M&A Playbook. Harvard Business Review, 89(3). https://hbr.org/2011/03/the-big-idea-the-new-ma-playbook

Corrado, C., Haskel, J., Jona-Lasinio, C., & Iommi, M. (2012). Intangible Capital and Growth in Advanced Economies: Measurement Methods and Comparative Results (Discussion Paper 6733; IZA Discussion Papers). IZA – Institute for the Study of Labor. https://repec.iza.org/dp6733.pdf

Corrado, C., Haskel, J., Jona-Lasinio, C., & Iommi, M. (2016). Intangible investment in the EU and U.S. before and since the Great Recession and its contribution to productivity growth (Working Paper 2016/08; EIB Working Papers). European Investment Bank. https://www.eib.org/en/publications/economics-working-paper-2016-08

Corrado, C., Haskel, J., Jona-Lasinio, C., & Iommi, M. (2022). Intangible Capital and Modern Economies. Journal of Economic Perspectives, 36(3), 3–28. https://doi.org/10.1257/jep.36.3.3

Corrado, C., Hulten, C., & Sichel, D. (2005). Measuring Capital and Technology: An Expanded Framework. In Measuring Capital in the New Economy (pp. 11–46). University of Chicago Press. https://ebookcentral.proquest.com/lib/vuw/reader.action?pq-origsite=primo&ppg=216&docID=432153#ppg=216

Crichton, S. (2009). Does workplace-based industry training improve earnings? Statistics New Zealand and the Department of Labour. http://www.educationcounts.govt.nz/publications/tertiary_education/education-outcomes/57460

Crichton, S., & Dixon, S. (2011). Labour Market Returns to Further Education for Working Adults (p. 99). Department of Labour. https://www.educationcounts.govt.nz/publications/80898/labour-market-returns-to-further-education-for-working-adults

Crouzet, N., & Eberly, J. (2021). Intangibles, markups, and the measurement of productivity growth. Journal of Monetary Economics, 124, S92–S109. https://doi.org/10.1016/j.jmoneco.2021.09.005

Crouzet, N., & Eberly, J. C. (2019). Understanding Weak Capital Investment: The Role of Market Concentration and Intangibles (Working Paper 25869; NBER Working Papers). National Bureau of Economic Research. https://doi.org/10.3386/w25869

Crouzet, N., Eberly, J. C., Eisfeldt, A. L., & Papanikolaou, D. (2022). The Economics of Intangible Capital. Journal of Economic Perspectives, 36(3), 29–52. https://doi.org/10.1257/jep.36.3.29

Demmou, L., & Franco, G. (2021). Mind the financing gap: Enhancing the contribution of intangible assets to productivity (1681). OECD Economics Department. https://www.oecd-ilibrary.org/content/paper/7aefd0d9-en

Demmou, L., Franco, G., & Stefanescu, I. (2020). Productivity and finance: The intangible assets channel—A firm level analysis (Working Paper 1596; OECD Economics Department Working Papers). OECD Economics Department. https://www.oecd-ilibrary.org/content/paper/d13a21b0-en

Elsten, C. M., & Hill, N. (2017). Intangible Asset Market Value Study? Les Nouvelles - Journal of the Licensing Executives Society, LII(4), 245–247.

Farhi, E. and F. Gourio (2018). Accounting for Macro-Finance Trends: Market Power, Intangibles, and Risk Premia. *Brookings Papers on Economic Activity* Fall 2018, 147-250.

Galor, O. (2011). *Unified Growth Theory*. Princeton University Press.

Hall, R., and D. Jorgenson (1967). Tax Policy and Investment Behavior. American Economic Review 57(3), 391–414.

Hashimzade, N., Myles, G., & Black, J. (2017). A Dictionary of Economics (5th edition (online)). Oxford University Press. https://www.oxfordreference.com/display/10.1093/acref/9780198759430.001.0001/acref-9780198759430

Hazledine, T. (2015, June). Tip of the iceberg? Organisational foundations of Top Pay in New Zealand listed companies, 1995-2014. New Zealand Society of Economists annual conference, Wellington, New Zealand. http://asset-lax-1.airsquare.com/nzae/library/hazeldine_tim.pdf?201506190810

Heiens, R. A., Leach, R. L., Newsom, P., & McGrath, L. C. (2017). The impact of advertising, goodwill, and other intangibles in the retail foodservice industry: Do intangible investments bite into investor returns? Journal of Foodservice Business Research, 20(2), 177–191. https://doi.org/10.1080/15378020.2016.1201646

Heys, R., & Fotopoulou, E. (2022). Delivering Tangible Estimates of non-SNA Intangible Assets. Office for National Statistics. https://www.imf.org/-/media/Files/News/Seminars/2022/10th-stats-forum/delivering-tangible-estimates-eurydice-fotopoulou-paper.ashx 16 November 2022

Jones, C.I. and P.M. Romer (2010). The New Kaldor Facts: Ideas, Institutions, Population, and Human Capital *American Economic Journal: Macroeconomics* 2(1), 224–245.

Kalecki, M. (1938). The determinants of distribution of the national income. Econometrica 6(2), 97-112, April 1938.

Karabarbounis, L., & Neiman, B. (2019). Accounting for Factorless Income. NBER Macroeconomics Annual, 33, 167–228. https://doi.org/10.1086/700894

Kerspien, J.A. and J.B. Madsen (2024), Markups, Tobin's *q*, and the Increasing Capital Share. *Journal of Money Credit and Banking* 56(2-3), 569-598.

Manning, A. (2003). Monopsony in Motion: Imperfect Competition in Labor Markets. Princeton University Press. http://www.jstor.org/stable/j.ctt5hhpvk

Martin, J. (2019). Measuring the Other Half: New Measures of Intangible Investment from the ONS. National Institute Economic Review, 249, R17–R29. Cambridge Core. https://doi.org/10.1177/002795011924900111

New Zealand Productivity Commission. (2021). New Zealand firms: Reaching for the frontier. https://www.productivity.govt.nz/assets/Documents/Final-report-Frontier-firms.pdf

Ocean Tomo. (2022). Ocean Tomo Intangible Asset Market Value Study. Ocean Tomo, a part of J.S. Held. https://www.oceantomo.com/intangible-asset-market-value-study/

O'Mahony, M., M. Vecchi and F. Venturini (2021) Capital Heterogeneity and the Decline of the Labour Share. *Economica* 88 (350), 271–296.

Picard, R., & Bertelsen, B. (2008). Capitalisation of Advertising Expenditure in the Media Industry: Regulatory Differences and their Consequences for International Financial Accounting. 128–133. DiVA. http://urn.kb.se/resolve?urn=urn:nbn:se:hj:diva-6747

Roberts, H. M. (2005). CEO power, executive compensation and firm performance, New Zealand, 1997-2002 (University of Otago Department of Finance Seminar Series). University of Otago. http://hdl.handle.net/10523/1524

Sandström, M. (2020). Intangible Capital, Markups and Profits (2020:4; Working Paper / Department of Economics, Uppsala University (Online), p. 48). Uppsala University, Department of Economics. http://www.diva-portal.org/smash/record.jsf?pid=diva2%3A1457375&dswid=125

Skinner, D. J. (2008). Accounting for intangibles – a critical review of policy recommendations. Accounting and Business Research, 38(3), 191–204. https://doi.org/10.1080/00014788.2008.9663332

SNA 2008 Update Project Team. (2023). Update of the 2008 SNA - Consolidated List of Recommendations. United Nations. https://unstats.un.org/unsd/nationalaccount/RAdocs/Consolidated_List_of_Recommendations.pdf

Syverson, C. (2019). Macroeconomics and market power: Facts, potential explanations, and open questions. Brookings Institute. https://www.brookings.edu/research/macroeconomics-and-market-power-facts-potential-explanations-and-open-questions/

Tumen, S., Crichton, S., & Dixon, S. (2015). The Impact of Tertiary Study on the Labour Market Outcomes of Low-qualified School Leavers (Working Paper Working Paper 15/07; New Zealand Treasury Working Papers). Treasury. http://www.treasury.govt.nz/publications/research-policy/wp/2015/15-07/

Tumen, S., Dixon, S., & Crichton, S. (2018). The Impact of Tertiary Study on the Labour Market Outcomes of Low-qualified School Leavers: An update (Working Paper Working Paper 15/07; New Zealand Treasury Working Papers). Treasury. http://www.treasury.govt.nz/publications/research-policy/wp/2015/15-07/

United Nations, European Commission, International Monetary Fund, Organisation for Economic Co-operation and Development, & World Bank (Eds.). (2009). System of national accounts 2008. United Nations. http://unstats.un.org/unsd/nationalaccount/sna2008.asp

Useem, J. (2024, April 20). Boeing and the Dark Age of American Manufacturing. The Atlantic. https://www.theatlantic.com/ideas/archive/2024/04/boeing-corporate-america-manufacturing/678137/

van Ark, B., Hao, J. X., Corrado, C., & Hulten, C. (2009). Measuring intangible capital and its contribution to economic growth in Europe. EIB Papers, 14(1), 62–93.

Zuccollo, J., Maani, S., Kaye-Blake, B., & Zeng, L. (2013). Private Returns to Tertiary Education—How Does New Zealand Compare to the OECD? (Working Paper WP 13/10; New Zealand Treasury Working Papers, p. 53). The Treasury. http://purl.oclc.org/nzt/p-1568.