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Rentiership and Intellectual Monopoly in Contemporary Capitalism: Conceptual Challenges and Empirical Possibilities

Joseph Baines
Department of European and International Studies
King's College London
Email: Joseph.Baines@kcl.ac.uk

Sandy Brian Hager
Department of International Politics
City, University of London

Abstract

In recent years, the concepts of rentiership and intellectual monopoly have gained prominence in discussions about the weakening link between corporate profitability and capital investment in high income countries. However, there have been few if any attempts to construct measures for rentiership and intellectual monopoly using firm-level financial data. The absence of such work, we argue, is symptomatic of challenges in delineating what qualifies as rent – whether it be intangible rent or otherwise. In place of static conceptions of rent and intellectual monopoly, we develop a framework for analyzing rentierization and intellectual monopolization as dynamic and variegated processes that are closely related to financialization. We apply the framework to the analysis of transformation of non-financial firms in the United States since the mid-twentieth century and show how it helps clarify the linkages between firm-level dynamics and trends associated with household inequality, corporate stratification and secular stagnation.

SER Keywords: capitalism, financialization, firm strategy, innovation, multinational firms, power

JEL Classifications: D4 Market Structure, Pricing, and Design; L1 Market Structure, Firm Strategy, and Market Performance; L2 Firm Objectives, Organization, and Behavior

Introduction: Rent Redux

In the toolkit of heterodox political economy, the concept of financialization has been widely deployed to capture transformations in contemporary capitalism over the past few decades

(Epstein, 2005; Stockhammer, 2008). More recently, another concept has loomed large: rentiership (Christophers, 2020; Mazzucato, 2019). Of course, the analysis of rent is nothing new. It extends all the way back to classical political economists in the late eighteenth and early nineteenth centuries. But the concept largely fell out of favour in the post-World War II period (Piketty, 2014; Sayer, 2023). What, then, accounts for this recent resurgence? One reason is that the concept of rent foregrounds competition and monopoly power more systematically than the concept of financialization. The emphasis on monopoly power inherent to rentiership is crucial because it helps to explain one of the key empirical puzzles within the financialization literature: the weakening link between profitability and domestic investment in high income countries (Durand and Gueuder, 2018; Gutiérrez and Philippon, 2016; Orhangazi, 2019). The concept of rent also promises to illuminate corporate-level dynamics in the closely related literature on intellectual monopolies (Pagano, 2014; Durand and Milberg, 2020; Rikap, 2021). Indeed, rentiership is seen most starkly in the knowledge economy given that intangible assets such as patents and other kinds of intellectual property enable giant tech firms to generate information or knowledge rents simply from their legal right to exclude others from using those assets.

Despite the connections that rentiership has with both financialization and intellectual monopoly, the relationship between these phenomena remains underexplored. One problem is that while scholars have developed a range of sophisticated measures to gauge processes of corporate financialization, there has been little if any work that has managed to measure rents, intangible or otherwise, at the firm-level. Addressing this challenge of measuring rents, we argue, is key to better understanding the articulation of financialization, rentiership and intellectual monopoly within contemporary capitalism. Our main contention is that the paucity of measurement of corporate rents arises from a problem of empirical operationalization: specifically, as Beth Stratford (2024, p. 41) has pointed out: “there is no practical way to distinguish the rent component within any given income”. Without a means of distinguishing rent from non-rent income, there is no way of confidently measuring rentiership at the corporate level.

In the first section of the paper, we account for this problem by offering an overview of the genealogy of rent in the history of economic thought from the classical political economists through to contemporary analysis. In the second section, we contend that making the category of rent amenable to empirical operationalization using corporate financial data requires a fundamental shift. Rather than try to empirically differentiate pure rents from pure profit, we need a dynamic approach that apprehends rentierization as a process. Specifically, we argue the rentierization is at play when corporate profitability is raised in service of financial returns

rather than productive investment. In other words, it is a particular species of firm-level financialization, which manifests when shareholder payouts grow relative to capital expenditures and when revenues grow relative to costs. By extension, in our framework, intellectual monopolization can be discerned when this process of rentierization is combined with intangible accumulation.

With this schema, in the third section we explore the dynamics of rentierization and intellectual monopolization among non-financial firms in the US from 1950 to 2019. We offer three key findings. First, rentierization and intellectual monopolization in the US corporate structure have become increasingly prominent since the 2000s. Second, on a sectoral level, whereas sector-wide profitability and payout-to-investment ratios were weakly negatively correlated in the mid-twentieth century, they are now strongly positively correlated; and whereas sector-wide intangible-intensity and market capitalization were once strongly negatively correlated, they are now weakly positively correlated. Third, the sectors which have been at the forefront of processes of intellectual monopolization – pharma and more recently tech – are among the most unequal in terms of firm-level profit, with a significant tranche of small, unprofitable but innovating companies subordinated to the leading firms in these two sectors. In the final section of the paper, we explain how these findings help us better understand the precise mechanisms behind the profit-investment gap and entrenched household inequality in high-income countries.

Where is the Rent? The Morphology of a Concept

We cannot do justice to the complexity and sophistication of the literature on rent in this short review. Rather our aim in this section is to engage with the evolution of rent analysis strictly with respect to the challenge of delineation and measurement. Do existing theorizations of rent from the era of classical political economy onwards enable us to distinguish rent from non-rent income at the level of corporate financial data? And do these theorizations, by extension, allow us to quantify rent? Our contention is that on both counts they do not. Whether this is a conceptual problem within rent theory or just a methodological issue depends on one's viewpoint. Existing theorizations of rent have certainly guided research that generates rich insights but that do not attempt to systematically measure rents using corporate financial data (e.g. Harvey, 2012; Purcell *et al.*, 2020). From this perspective, the conceptual value of rent theory and the challenges of empirical operationalization can be considered entirely separate matters. However, if one adopts the stringent empiricist view that any theorization of rent

should enable us to delineate and measure precisely how much rent is being accrued, and that such measurements are best applied to the quantitative architecture of capital itself – corporate financial accounts – then the methodological issue becomes a conceptual problem (see Nitzan and Bichler, 2009). Given our own analytical priors we tend towards the latter perspective. However, this of course does not invalidate the former viewpoint.

In Adam Smith's writings, rent is understood as one of the three functional categories of income that correspond to the three great classes of capitalist society. Whereas wages are earned by labour and profits accrue to capitalists, rent is paid to landowners. Rent from Smith's perspective is essentially land rent, and in his adding-up theory of exchange values, 'natural prices' around which actual market prices gravitate, are the sum of wages, profit and rent. Exploring the view that labour is the sole prerequisite of value, Smith (1977/1776, pp. 76-77) also contended that both rent *and* profit are deductions from that which is produced by labour:

“The real value of all the different component parts of price, it must be observed, is measured by the quantity of labour which they can, each of them, purchase or command. Labour measures the value, not only of that part of price which resolves itself into labour, but of that which resolves itself into rent, and of that which resolves itself into profit.”

These arguments anticipated an idea which subsequently became central to much of the literature on rentiership: that rent is unearned income involving the transfer of funds from producers rather than a contribution to overall wealth (Mazzucato *et al.*, 2023, p. 509). But since profit was deemed by Smith as being part of this transfer of funds, the fundamental distinguishing factor between profit and rent was not from Smith's perspective that profit was a form of income that derived from productive activity and rent was a form of income that derived from unproductive activity, but rather that profit accrued to the owners of capital stock and rent to the owners of land. From Smith's position, therefore, there was no issue in determining what rent is: it simply entailed measuring the income collected by landowners. However, from a contemporary perspective, where rent is seen as part of the income that is accrued by corporations from operations that extend well beyond landownership, the question of what precisely qualifies as rent becomes more troublesome.

David Ricardo developed rent theory with his concept of differential rent, which held that the magnitude of rent was determined by the difference between the production cost on any given site and the production cost of the most marginal land brought into cultivation (Stratford, 2023). With this conceptualization, Ricardo contended that rent is a surplus that arises from the differential productivity of land rather than just a component of the natural price of goods as Smith suggested. Karl Marx built on Ricardo's analysis of differential rent through his

conception of what Anwar Sheikh (2016, p. 265) calls 'regulating capital': those with the lowest-cost conditions that are reproducible by others to satisfy demand in any given industry. From Marx's perspective, market prices gravitate towards the sum of the costs of the regulating capital and the average rate of profit. Therefore, where lower-cost producers have conditions of production which are not reproducible, the landholder accrues rents in the form of excess profit (Shaikh, 2016, pp.: 265-266). In developing his theory, Marx supplemented this notion of differential rent with two additional conceptualizations: monopoly rent that derives from control of a non-substitutable feature of a commodity, and absolute rent that accrues to a class of owners simply on the basis of the right to exclude non-owners via the institution of private property (Purcell *et al.*, 2020).

The sophistication of Marx's theory is borne out by the prodigious research it has helped inspire. Moreover, given that Marx was writing at a time when the modern accounting system was in embryonic form, he can be forgiven for producing analytical categories which are not readily amenable to empirical research that uses corporate financial data. That said, in Marx's conception of differential rents, the issues of demarcation and measurement persist. As one leading Marxist theorist of rent, Erik Swyngedouw, (2012, p. 311) admits: "determining the magnitude of rent [...] remains theoretically complex and empirically intractable". There is no straightforward way of identifying which companies are 'regulating capitals' because beyond a few select industries where what is produced is relatively homogenous – such as mining and oil production – cost curves are impossible to construct with any accuracy. The concepts of monopoly and absolute rent are similarly hard to pin down since, in practical terms, it is impossible to identify what portion of income is derived from the non-substitutable element of a particular commodity and what portion is derived from the baseline conditions of class power enjoyed by all owners. In an analysis that considers Marx's typology of rents in the context of the real estate sector, Ward and Aalbers (2016, p. 1764) recognize these challenges: "the different forms of rent, it must be made clear, may be at work simultaneously and are empirically indistinguishable as the actual rent is only paid in lump sum." Outside of real estate where rent does not even present itself as a 'lump sum' the problems of identification and measurement obviously become even more vexed.

Economists who began writing after the marginalist revolution sought to establish a baseline for measuring rent by extending Ricardo's theory of differential rent to all factors of production and by breaking decisively from Marx's class-analytic lens. In conditions of equilibrium, income on the margin was understood by marginalists as the rent-free 'reservation price' for each factor of production. These prices simultaneously reflect each factor's marginal contribution and are the minimum necessary to attract them out of either idleness or alternative use

(Stratford, 2023, pp. 352-355). Any income earned in excess of this reservation price is defined as rent. However, this theorization itself led to problems. Ricardo's theory of differential rent appeared compelling where the baseline was land for which there was no other use. But in the case of capital, there may be myriad alternative uses whose profitability is only infinitesimally smaller than the use to which it is being put. This makes the rent derived from a given use itself infinitesimally small. At a more fundamental level, it also assumes that profits derived from alternative uses are themselves determined under competitive conditions and are thus rent-free. In practice, the prices derived from alternative uses need not be seen as rent-free because each reflect the balance of power between parties involved in exchange (see Hale, 1923). From this relational perspective, as Beth Stratford (2023, p. 353) contends: "it makes no sense to use prices that are already distorted by the unequal control over scarce and monopolised assets as a benchmark for estimating what proportion of incomes arise from that very inequality".

Marx's concept of absolute rent at least at an analytical level addresses the role played by pre-existing inequalities of class power in the formation of rent. The marginalist economists neither developed the conceptual vocabulary nor the empirical means to apprehend the role played by unequal relations of class power in rent generation. The formulation that neoclassical economists came to embrace – that rent was "payment in excess of competitive price" (Stratford, 2023, p. 355) – simply assumed that competitive prices obtained in reality and were empirically discernible. But as the Cambridge Controversy revealed, there is no way that neoclassical economists can determine the marginal productivity of capital since heterogenous capital goods cannot be aggregated independently of the prices they are meant to explain. And therefore, there is no means of establishing what precisely would constitute either marginal product or rent (Nitzan and Bichler, 2009, pp. 77-83). Anticipating this controversy, Thorstein Veblen – writing at the beginning of the twentieth century – avoided using the concept of rent with reference to modern corporations altogether; and he was dismissive of attempts by his contemporaries, such as Alfred Marshall, to apply the concept to business enterprise, deriding such work as "unduly bulky, unwieldy, and inconsequent" (Veblen 1900, p. 264). Veblen argued that, in fact, many of the processes associated with the concept are part of the ordinary dealings of business in which gaining "differential advantage" over other firms had become the prime motive force within capitalism (Veblen, 2013/1904, p. 201, n.6). Crucially, for Veblen, the profit arising from this differential advantage derives from the power to *restrict* industrial productivity, rather than from actually contributing to productivity (Veblen, 2013/1904; Nitzan and Bichler, 2009). To the extent that rent is referred to in Veblen's work, it is specifically in relation to land rent, just as it was in the work of early classical political economists such as Adam Smith.

In contrast to Veblen, Joseph Schumpeter did not view the restrictive capacity of business as necessarily negating industry. Just as brakes allow motorists to avoid accident and to ultimately drive faster, Schumpeter (2003/1943, pp. 88-89) argued, corporations' capacity to restrict industry in periods of potential disruption allows them to avoid collapse and increase output over the long run. As a backdrop to his theorization of capitalist profits, Schumpeter advanced a 'circular flow model' in which an economy is in a state of general equilibrium. In these stationary conditions, capitalist profit would tend toward zero and there would be no economic development. Such a model had no descriptive or prescriptive value for Schumpeter but it did provide him a useful counterpoint for his analysis of how capitalism actually operates as an evolutionary system. For Schumpeter, capitalist development occurs as innovators achieve technological breakthroughs which generate "entrepreneurial profits", and as imitators catch up, the new technology is diffused leading to a period of "comparative quiet" during which profits returned to normalcy, only for the cycle to begin anew (Schumpeter, 2003/1943, p. 83). Such entrepreneurial profits, for Schumpeter (1983/1934, p. 184), have nothing to do with marginal productivity:

"the problem of profit lies precisely in the fact that the laws of cost and of marginal productivity seem to exclude it. And what the 'marginal entrepreneur' receives is wholly a matter of indifference for the success of the others."

Even though in our view Schumpeter exaggerated the positive impacts of large-scale business, his evolutionary approach has the merit of decisively wresting the question of profit away from the concept of marginal productivity. Importantly, Schumpeter did not equate rent with entrepreneurial profit. In fact, like Veblen, he was reticent to invoke the term beyond its application to land - or what he called "natural agents" (Schumpeter, 1939, p. 575). On the rare occasion where he does apply the concept of rent with reference to business, it describes the "unearned increment" that ensues after the initial entrepreneurial breakthrough has been made. Schumpeter (2002/1911, p. 111) is explicit that this "unearned incremental income is not a reward for performance". However, insofar as restrictive strategies operate like brakes in a car - facilitating what Schumpeter (2003/1943, p. 87) calls a "balanced advance" in the promotion of economic progress - to what extent can income derived from such strategies be truly considered "unearned"? Schumpeter rightly de-emphasizes marginal productivity in his analysis, but he does not provide any means of practically delineating the "unearned increment" from "entrepreneurial profit", nor for that matter does he tell us what appropriate "reward for performance" would be. In the annals of rent theory Schumpeter therefore leaves us with generative insights but no means of apprehending and gauging rent as a determinate economic fact.

Within the contemporary heterodox literature on rent, the most important contributions have come from scholars broadly influenced to varying degrees by Marx, Veblen and Schumpeter. One of the leading contemporary theorists of rent is Brett Christophers (2019) who takes issue with those scholars who conceptualize rent in terms of 'unearned income' (see e.g. Sayer, 2015; Mazzucato, 2019). We have already raised our own doubts about the analytic efficacy of the distinction between earned and unearned income. Christophers (2019) does so from a decidedly Marxist perspective, arguing that all profit is unearned insofar as labour is the sole source of value, and it is the surplus extracted from labour rather than anything 'earned' by capitalists that constitutes the basis of profit. He acknowledges that in Andrew Sayer's case there is an attempt to grapple with this problem through the notion of 'working capitalists' whose profit is *partly* earned to the extent they help to organize work, or at least insofar as such profit is "dependent on supporting productive activity" (Sayer 2015, p. 87). But as Christophers (2019, p. 315) pointedly asks "where [...] does 'supporting' productive activity end and actually 'doing' it begin?" As a follow-up to Christophers' question, we might ask: how do we determine what amount of profit comes from *supporting* productive activity and what amount of profit derives from *restricting it* in the sense conceived in Veblen's analysis? Just as we have argued in relation to the historical contributions to the analysis of rent, there is a significant challenge faced by contemporary theorists in drawing clear lines upon which any workable definition of rent should be based.

Christophers' attempt at addressing the challenge of delineating rent consists in arguing that rent arises from the conjugation of two conditions. First, that it is "income derived from the ownership, possession, or control of scarce assets"; and second that this income is generated "under conditions of limited or no competition" (Christophers, 2019, p. 308-309). This definition is helpful in that it stays clear of the seemingly irresolvable matter of quantifying what portions of capitalist income are "earned" and "unearned". However, in resolving one problem of delineation, it creates two new problems. The first is differentiating scarce assets from non-scarce assets. As Marx himself anticipated in his concept of absolute rents, all assets are scarce insofar as they are anchored in the legal right of exclusion (see also Nitzan and Bichler 2009: 228). Beyond this fundamental fact regarding the baseline conditions of exclusion as encoded by private property, we might consider scarcity also in relative terms. However, even if we did find a way of gauging the relative scarcity of an asset, there is no objective way of determining the point in this continuum between the two poles of complete scarcity and complete abundance in which assets qualify as 'scarce'. Similarly, there is the issue of delineating what constitutes "limited or no competition". When we acknowledge that in actually existing capitalism, perfect competition rarely if ever exists then it becomes clear that in almost all situations competition is to varying degrees "limited". Rather than there being a bright line

that divides perfectly competitive markets from markets where competition is completely absent, the one market form shades into the other. Therefore, while Christophers (2019, p. 315) is surely right to ask Sayer where 'supporting' productive activity ends and actually 'doing' it begins, for his alternative definition of rent to be analytically tractable we should ask where is competition "limited" enough to be defined as such? And where, for that matter, does 'scarcity' end and 'non-scarcity' begin?

Interestingly, contemporary rent theorists including Christophers (2019, p. 321-22) invoke Michał Kalecki's concept of the degree of monopoly as a way of evidencing a rise of monopoly power inherent in rentierism. Gesturing to our concerns about delineation, Sayer (2023, p. 1473) also references Kalecki approvingly in claiming "[m]onopoly need not be an all-or-nothing matter: there can be degrees of monopoly." However, the invocation of Kalecki's work raises uncomfortable questions for these scholars' approaches to rentiership. If there are degrees of monopoly, does that mean there are also "degrees of rents"? And if rent itself can be seen as a matter of degree, doesn't that make the concept untenable in its amorphousness? Sayer (2023, p. 1473) ventures this possibility but is then quick to dismiss it:

"There is inevitably often some uncertainty or fuzziness regarding 'where to draw the line', because it may be difficult to estimate what prices would be in the absence of monopoly. Here, we must avoid the fallacy of continuum, according to which the absence of a clear dividing line must mean the absence of any difference, as if the existence of some unclear cases meant the absence of any clear cases. It is the most egregious forms that should concern us most."

The passage gets to the heart of what is at stake in conceptualizing rent. Do we draw sharp lines or do we think in terms of a continuum? In our view, Sayer's arguments in favour of sharp lines are unconvincing. The line between rent and profit is not "uncertain" or "fuzzy"; it is indefinable because of the dualisms underpinning rent theory are impossible to operationalize at the level of firm-level data. As we have seen in this review, these dualisms include earned and unearned income, scarce versus non-scarce assets, competition versus monopoly and much else besides.

In trying to wed the rent/profit dualism with the degree of monopoly, Sayer is forced to make a major concession. Since the boundaries between rent and profit are blurred, he argues that we should concern ourselves with the "most egregious cases" of rentiership. But if we must confine our analysis to only the most extreme cases of rentiership then what value is there in deploying the concept in the first place? A crucial reason why the concept of rentiership has become so prominent is because it is meant to capture something general about the nature of

contemporary capitalism (Baglioni *et al.*, 2021; Christophers, 2020). Limiting the study of rent to the most egregious forms seems, in our view, unnecessarily restrictive, especially for those who want to employ the concept of rents to analyse the wider structural transformations in the capitalist economy. This is not to say that the insights of historical and contemporary scholarship on rent should be disregarded altogether. As the next section shows, there is much we can and should learn from this work. But to make the concept of rent both analytically and empirically tractable, we must shift to a new footing.

Toward a New Framework: Financialization, Rentierization and Intellectual Monopolization

As we have argued so far, the literature on rent has encountered significant challenges in defining the concept of rent in opposition to other forms of income, and largely because of this there has been a dearth of studies that seek to quantify rent at the firm-level. The way through this impasse, we contend, is to fundamentally re-orient our focus. Rather than seeking to apprehend rent in static terms – as if it is a type of income that can be delineated at any point in time – we should instead focus on *rentierization* as a dynamic, open-ended and variegated process. For reasons that will become clear in this section, we define rentierization as the *raising of profit margins in service of financial returns instead of long-term investment*. In advancing this understanding of rentierization, we draw on heterodox literatures within and beyond the scholarship on rentiership: the first is the post-Keynesian literature on market power; the second is the critical scholarship on corporate financialization; and the third is the analysis of predation and intellectual monopoly inspired by both Marx and Veblen. In building our alternative framework, we go through each of these constituent elements of our approach in turn, first by articulating the relationship between rentierization and financialization, and then by articulating the relationship between rentierization and the rise of intellectual monopolies.

i. The relationship between rentierization and financialization

The starting point for the post-Keynesian literature on market power is Kalecki's aforementioned concept of the degree of monopoly, which modelled the level of competition within capitalism in terms of the price markup (Melmiès, 2023). On the basis of this metric, Kalecki posited that the higher the degree of the monopoly, the greater capital's overall income share. A subsequent branch of post-Keynesianism, known as investment financing theory developed a more nuanced view of markups and their relationship to competition (Wood,

1975; Eichner, 1976). According to this approach, high markups might not reflect monopoly power, but instead the firm's need to internally finance its growth, which could be due to heightened competitive pressures. This may be particularly the case with capital-intensive firms given that capital expenditure is, by definition, capitalized rather than deducted as an operating expense, and therefore does not drag net profit margins downward. A high markup can thus pull in two different directions. On the one hand, it may indicate growing market power. On the other, it may be a sign of competition-induced internal financing needs.

To adequately capture the monopoly power at the heart of rentierization, investment financing theory compels us not only to consider the markup but also the strategic orientation of the firm. In this respect, the critical scholarship on corporate financialization is indispensable as it charts a shift in corporate governance, especially in the US context, away from a model of retaining and reinvesting earnings towards one of downsizing operations and distributing the gains to shareholders (Lazonick and O'Sullivan, 2000). Moreover, unlike the literature on rentiership, which offers a paucity of measures for gauging firm-level rents, the literature on financialization offers a large range of useful metrics for analysing the shift in firm orientation away from long-term investment toward short-term shareholder returns (Rabinovich, 2019). In this study, we focus on a metric developed in our previous research: the ratio of stock buybacks and dividends to capital expenditures (henceforward the 'payout-to-investment ratio') (Hager and Baines, 2020; Baines and Hager, 2021). We find this metric instructive precisely because it gauges the balance of a firm's priorities when it comes to increasing shareholder payouts versus investing in future growth. Increasing dividend payments and stock buybacks and falling capital expenditures have been identified as key facets of financialization (Lazonick, 2010; Palladino, 2021). Yet it also captures the process of rentierization in two important respects. First, a decline in capital expenditures (the denominator) can be used as a proxy for the slowdown in investment and excess capacity that typifies growing monopoly power (Gutiérrez and Philippon, 2017; Durand and Gueuder, 2018). Second, an increase in financial payments to shareholders (the numerator) is commonly associated with the power of a resurgent rentier class (Mazzucato, *et al.* 2023). In other words, the payout-to-investment ratio allows us to determine the extent to which a company is focussed on what Sayer (2015, p. 87) calls "supporting productive activity" rather than simply extracting value.

Crucially, a rising payout-to-investment ratio does not by itself indicate rentierization. If it did, rentierization would be virtually synonymous with financialization itself, and therefore would have little analytical value. Circling back to Kalecki's concept of the degree of monopoly, we specify that rentierization is only observed when this process of raising shareholder returns relative to capital investment is accompanied by an increasing markup. If a company increases

its payout-to-investment ratio but does not increase its markup, it is not exhibiting the growing market power that we see as integral to the process of rentierization. If, in contrast, a company increases its markup but does not increase its payout-to-investment ratio, then it more likely approximates those firms identified within investment finance theory that raise their markup to internally finance their future growth in conditions of significant competition (Wood, 1975; Eichner, 1976).

As far as we are aware, no study has sought to map rent empirically with reference to the degree of monopoly. How then do we go about identifying the degree of monopoly using company financial statements? Kalecki thought of the degree of monopoly in terms of pricing power at the level of production units, as expressed in the price markup (unit sale price minus cost of unit sold). Yet this definition of the price markup does not lend itself easily to empirical mapping as company financial statements do not report unit-level prices and costs (but see De Loecker *et al.*, 2020). With these empirical limitations of the unit-level price markup in mind, we build on existing efforts to map out the firm-level manifestation of the degree of monopoly with reference to profit margins (Nitzan and Bichler, 2009; Baines and Hager, 2021; Melmiès, 2023). One common empirical strategy within the literature has been to estimate the degree of monopoly as sales relative to the cost of goods sold (COGS). This is simply calculated as $(\text{Sales} - \text{COGS})/\text{COGS}$, and it broadly tracks a company's gross profit margins (Davis and Orhangazi, 2021, p. 27). Our approach focuses on net profit margins (net profits as a percentage of sales) as a proxy for the degree of monopoly (Nitzan and Bichler, 2009). By moving attention away from production units to the firm itself, we get a better sense of the corporation as a broad ensemble of power. And by moving attention away from gross profit to net profit margins, we can get a better sense of a firm's capacity to not only reduce direct production costs (as proxied by COGS) and increase sales volume (as tracked by revenues), but also to control other financial flows including interest expenses, selling, general and administrative expenses and tax payments. In other words, by widening the vista (from unit to firm and from production costs to all costs), we gain insight into the firm's power not only relative to suppliers and labour, on the one hand, and customers on the other, but over society at large through its relationship with tax authorities, creditors and much else besides.

Through examining these two parameters of net profit margins and the payout-to-investment ratio we can formulate a dynamic schema of firm-level change presented in Figure 1. The schema yields four ideal-typical trajectories (see also Durand and Baud, 2024, p. 323). The companies engaged in what we call capital expansion are those firms highlighted in investment finance theory that have high profit margins but re-channel their retained earnings into internally financing the expansion of physical stock to maintain economies of scale and

competitive advantage over rival companies. They are, in other words, the protagonists of the 'balanced advance' that Schumpeter (2003/1943, p. 87) approvingly observed in large corporations in the middle of the twentieth century. In contrast, companies set on a trajectory of contractive reinvestment are either undergoing long-term decline albeit from a high level of profitability, becoming increasingly peripheral in the capitalist economy, or they qualify as 'growth stock' companies that sacrifice short-term margins and shareholder payouts for long-term market expansion. Firms on a course of what we call financial extraction tend to be those that succumb to financial pressures even as the basis for long-term profitability may be eroding. At best, they may qualify as so-called mature 'yield stock' firms. At worst, they may be hollowing out in conditions of subordination. The most important trajectory to our study is rentierization, which we defined earlier as the raising of profit margins in service of financial returns. The phenomenon maps on closely to what Durand and Baud (2024, p. 324), borrowing from Veblen, call "predation" in which the effect is not to generate new wealth but rather to redistribute existing wealth. This firstly means that the high levels of profitability enjoyed by the firm in question is concomitant with the incomes of other firms, along with workers, being squeezed. Secondly, it means the firm's relatively low levels of capital investment are partially offset by other more capital-intensive firms that may not offer such large shareholder returns.

[insert Figure 1 here]

ii. *The relationship between rentierization and intellectual monopolization*

Conceptualizing rentierization as a process draws our attention to its potential fluctuations across time and space. How do we account for these variegated dynamics and how do we relate these dynamics to the rise of intellectual monopoly capitalism that has been increasingly analysed in recent years (Pagano, 2014; Rikap, 2021)? In this literature, some scholars highlight the importance of network effects in digital platforms that spur monopolizing dynamics (Durand and Milberg, 2020). Others pay close attention to how intellectual property allows firms to centralize control over intangible assets, while outsourcing less profitable tangible activities to suppliers that – in the process – become subject to intensified competition. This work emphasizes the dialectical interplay of intangible assets with standardization to explain the strategies of lead firms in global value chains. Lead firms use standards to control how and what their suppliers produce and exchange, bringing homogeneity to products they buy, and they use intangibles to differentiate products they sell, to reinforce their dominance within the value chain (Baglioni *et al.*, 2022). The consequence of this dominance is an

exaggerated “smile curve” (Durand and Milberg, 2020, p. 409). On each end of the value chain are the intangible-intensive activities of lead firms that capture large amounts of value (e.g. R&D on one end, marketing and branding on the other), and in the middle of the chain are the capital-intensive activities of subordinate firms subject to competitive pressures that push down their share of value. Although these dynamics have been principally identified in outsourcing and offshoring of manufacturing within buyer-driven global value chains, similar processes are at play among leading firms in the hospitality sector that externalize labour-intensive, lower value-added processes via the franchise system (Schwartz, 2022).

However, one important observation emphasized by Cecilia Rikap (2021) is that firms with high-levels of R&D-spending will not necessarily be more profitable than those involved in tangible operations. In fact, they may be less profitable given the huge risks entailed in early-stage R&D-intensive activities. In this context, intellectual monopolies may outsource some of the riskiest R&D-intensive activities to smaller and more innovative firms, while internalizing the resulting innovations into their own portfolio of intangible assets through acquisition and other methods (Rikap, 2021). Given these considerations, there is a need to not only examine the relative weight of intangible versus tangible assets in a company’s asset structure, but to also determine how successfully they are able to *capitalize* these assets in the form of improved market value (i.e. in higher expected earnings, and lower associated risk) (Nitzan and Bichler, 2009).

For the purposes of our analysis, we understand intangible accumulation to arise when the value of a firm’s intangible assets rises relative to tangible assets and when the firm’s market capitalization rises relative to GDP. We measure market capitalization relative to GDP because we are interested in gauging a company’s capacity to convince investors that its expected future profits (discounted to present value and adjusted for risk) will grow at a faster rate than current economic activity in the country in which it is headquartered. Our framework for the analysis of intangible accumulation yields another dynamic and stylized model of firm-level change in Figure 2. Much like those corporations on a path of capital expansion described above, companies on a long-term trajectory of tangible accumulation likely preside over vertically integrated, producer-driven value chains, and generate profits via control of asset-specific physical capital (Schwartz, 2021). Companies on a trajectory of tangible decumulation are likely to be succumbing to the fates of “laggard” or “complier” firms (Rikap, 2021, p. 34-37). As they become more focused on developing their tangible fixed assets, they become more subordinate to lead firms’ demands and in the worst case become suppliers of generic, easily substitutable products. Similarly, companies on a pathway of intangible decumulation exhibit the subordinate traits of laggard or complier firms, but unlike these

companies, take on risky R&D projects that lead firms avoid. Finally, those companies on a long-term trajectory of intangible accumulation will likely become intangible-intensive lead firms that preside over the buyer-driven value chains that have predominated in much of the global economy in the past three decades. These companies concentrate control over core intangible assets, while outsourcing riskier R&D activities to smaller innovators and less profitable tangible activities to capital-intensive firms (Rikap, 2021).

[insert Figure 2 here]

Unfortunately, obtaining data on intangible assets is not straightforward (see Corrado *et al.*, 2012; Haskel and Westlake, 2018; Crouzet and Eberly, 2019). Some intangible assets are recorded on corporate balance sheets, but not by all companies (for example, Apple Inc. has not recorded any intangible assets in its accounts since 2017). Other intangible assets are not recorded by any firm because they are developed in-house and are thus not subject to arms-length market transactions. All that can be recorded with any confidence are the intangibles that are purchased by a firm directly from the market (e.g. licenses, trademarks, copyrights etc.) and the “goodwill” generated from a merger (i.e. the difference between an acquired firm’s book value, and the price at which it was bought) (Nitzan and Bichler, 2009). In this context, the best that can be done is to formulate proxy measures. To this end, Ryan Peters and Lucian Taylor (2017) have reconstructed values for intangible assets for firms by using data on their total R&D spending and a fraction (30%) of their selling, general and administrative expenses (SG&A) (to capture marketing, branding and design efforts) and by depreciating them by specific industry-specific R&D depreciation rates.

Following other researchers (e.g. Auvray *et al.*, 2021; Rabinovich, 2023), we use the Peters and Taylor dataset to estimate intangible assets. There are, of course, limitations to these data. The 30% of SG&A expense going into intangible investment is a best-guess for US-listed firms in general and may not align closely with the actual practices of individual firms. And industry-specific estimates for depreciation may not accurately reflect the specific lifespans and replacement rates of the unique and heterogeneous set of assets deployed in individual firms’ R&D, marketing, branding and design programmes (Penman, 2023, p. 9). Notwithstanding these limitations, Peters and Taylor’s estimates are the most easily accessible firm-level intangibles data there are, the most widely used and, as one leading analysis suggests, “they are arguably the best available” (Ayyagari *et al.*, 2024). For these reasons, we use the dataset for our analysis.

iii. The nexus of financialization, rentierization and intellectual monopolization

Combining the dynamic schemas of rentierization and intangible accumulation, our analysis is built on the conceptual model depicted in Figure 3. The main points in the figure can be summarized as follows. Rentierization occurs when firms increase their profitability in service of shareholder returns rather than capital investment. In other words, rentierization occurs when firms raise revenues relative to costs, and increase dividends and shareholder buybacks relative to capital investment. Intangible accumulation occurs when firms successfully capitalize growing intangible intensity. In other words, intangible accumulation occurs when firms expand their intangible assets relative to their tangible assets, and when their market capitalization grows faster than underlying economy activity. Intellectual monopolization occurs when firms combine rentierization with intangible accumulation.

[insert Figure 3 here]

In what remains of this analysis, we show how the framework applies to US-listed companies as a whole; we then disaggregate by sector; and then by size. Our exploration is guided by the following questions. At what point in the last seven decades did rentierization become a prevailing trend within US capitalism? What is its relationship to intangible accumulation? Are the most profitable sectors the most financialized, and how has the relationship between sectoral profitability and financialization changed through time? Similarly, are the most intangible-intensive sectors the most highly capitalized, and how has the relationship between intangible intensity and market valuation changed? Which sectors exhibit the acutest polarization of profitability and market capitalization between large and smaller firms, and in which sectors are smaller companies more rather than less intangible-intensive than large ones? Finally, what are the macroeconomic implications of the firm-level transformations we uncover in our analysis?

Mapping Rentierization and Intellectual Monopolization in the United States

We begin our empirical analysis in broad terms, charting the processes of rentierization and intellectual monopolization for all publicly-listed non-financial firms headquartered in the US. Importantly, when it comes to operationalizing these metrics, we use ten-year moving averages to capture long-term shifts, rather than transient ‘entrepreneurial profits’ that Schumpeter emphasizes in his analysis of innovation. We see in the left-chart in Figure 4 that in the 1950s the average company was tangible-intensive and highly profitable, but much of

these profits were channeled to internal financing as revealed in the low levels of dividends and stock buybacks relative to capital investment. However, from that high point of capital expansion we see three successive shifts that have taken us to where we are today. The first takes place between 1950s and the late 1970s. During this period, US corporations in the aggregate undergo a process of contractionary reinvestment: increasing their capital expenditures relative to their shareholder payouts even as their profitability declines. The shifts are in part explicable in relation to how the Chandlerian firm responded to both the pressures of competition from abroad and the power of organized labour at home (Glyn, 2007). Both international competition and the bargaining power of a large swathe of workers forced companies to reduce the amount of profit they could command from their operations and to continue to re-invest their profit in expanding productive capacity. By the end of the 1970s, the average payout-to-investment ratio reached its lowest level in our entire period of analysis.

[insert Figure 4 here]

The second shift took place between the 1980s and the 1990s. While profit margins continued to fall, the payout-to-investment ratio began to rise – indicating that financial extraction was becoming a key force within US capitalism as a whole. This period has helpfully been termed by Auvray *et al.* (2021) as ‘Financialization Mark I’. In this financialization regime, several stylized facts can be discerned. High interest rates served to increase the hurdle rates on productive investment, diminish companies’ profit margins and reduce their capacity to finance investment externally through raising debt. International competition further squeezed profitability - exacerbating companies’ difficulties in financing investment internally through retained earnings. Finally, changes in corporate governance brought the interests of managers in alignment with shareholders, while legal and regulatory shifts undermined labour’s bargaining power in firm decision-making, so that short-term returns to equity owners became increasingly prioritized over long-term investment (Auvray, 2021; Schwartz, 2022).

The third shift has taken place from the 2000s onwards. The payout-to-investment ratio increased at a greater rate than before and, after the bursting of the dot-com bubble, average profitability began to rise significantly. This marked the beginning of the period that Auvray *et al.* (2021) term as ‘Financialization Mark II’. In this financialization regime the deepening of global value chains and the further decline in labour’s bargaining power put downward pressure on consumer demand and further weakened investment. The monopolization of capital has led to a concentration of profit among the largest firms which have a lower marginal propensity to invest. And the strengthening of intellectual property protections has stymied the capacity of smaller firms in the US and abroad to upgrade in higher value-added activities

(Durand and Milberg, 2020). Finally, the emergence of permanent universal owners, such as BlackRock, with crossholdings in myriad companies has discouraged investments that may threaten to induce profit-destroying competition in multiple product markets (Azar *et al.*, 2018). In contrast to Financialization Mark I, the overall driving force behind financialization is less the restraints on external financing (high interest rates) and internal financing (low retained earnings), but rather a drying up of profitable investment opportunities in the context of deepening labour retrenchment, corporate monopolization and equity ownership centralization (Auvray *et al.*, 2021). By the end of 2010s, non-financial corporations registered profit margins that were last reached in the 1950s. But unlike the 1950s, in the 2010s these firms remarkably spent as much on shareholder payouts as they did on capital investment: signifying the prominence of rentierization in the US economy.

How do the data presented in the right chart in Figure 4 on intangible intensity and market capitalization map onto this periodization? Intangible intensity appears to rise throughout the whole period apart from the 1970s. However, this decade of apparent reversal is solely the result of the introduction of a large number of utility firms into the dataset with huge tangible footprints (see supplemental file). By discounting the effects of these utility companies, and by focusing on the rate of change of intangible intensity rather than its levels, we see a structural break in dynamics in the early 1980s. In the three preceding decades, the growth rate in intangible intensification was declining, but from the mid-1980s to the late 2000s, intangible intensification proceeded at an increasing rate. The rapid rise in intangible asset values relative to tangible fixed assets coincided with the entrenchment of intellectual property within the US from the 1980s onwards, and subsequently abroad through the 1995 Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) and the trade agreements that followed (Orsola and Coriat, 2006; Durand and Milberg, 2020). While growth rates in intangible intensity have since subsided, they are not down to the levels reached in the early 1980s. The take-off in the intangible intensification of US-listed companies from the 1980s is consonant with the rise in expansion of equity markets and the concomitant decline of bank-based systems. As intangibles serve as poor collateral for banks, companies from the early 1990s onwards increasingly turned to equity markets to raise finance (Baines and Hager, 2021). And as equity became a prominent part of their capital structure, companies increasingly made investments in highly specific intangible assets, rather than relatively generic, collateralizable tangible assets, to satisfy shareholders' demands for improved relative performance (Pagano, 2019).

Disaggregating by Sector

The preceding analysis provides a vivid aggregative picture of the dynamics of US capitalism, but we have yet to establish how processes of rentierization and intangible accumulation vary across sectors and firm-size. We begin by disaggregating the data on sectoral lines, classifying firms in ten different sectors that account for 70% of the market capitalization of all companies in our entire dataset from 1950-2019: apparel and footwear (fashion); automotive manufacturers; defence and aerospace; food and beverage; heavy industry; hotels and restaurants (hospitality); fossil fuels and mining (extractives); pharmaceuticals; retail; and tech (see supplemental materials for more details). Figure 5 compares the ten sectoral groups according to the four main parameters of this study: net profit margins, the payout-to-investment ratio, the intangible intensity ratio, and market capitalization. To trace changes in these parameters over the post-war period the figure shows snapshots for the 1950s (the top two charts) and the 1980s (the bottom two charts).

[insert Figure 5 here]

Figure 5 clearly shows that in the 1950s there was a negative, albeit weak, correlation between sectors' profit margins and their payout-to-investment ratio. The most profitable sectors such as the tech and extractive sectors tended to offer relatively low shareholder payouts. Similarly, we can see that the sectors that had the highest aggregate market valuations tended to be tangible-intensive. By the 1980s there was a clear shift: the most profitable firms no longer were those that tended to have the lowest payout-to-investment ratio, but rather the highest. Moreover, with the decline in the relative capitalization of tangible-intensive sectors such as the extractives, automotive and heavy industries, and the rise of the intangible-intensive pharma sector, the negative correlation between intangible intensity and market capitalization was weakening.

Figure 6 rounds off the story regarding sector-wide dynamics by presenting rentierization and intangible accumulation metrics for the 2010s (the top two charts), and by presenting how the correlations between sectoral net profit margins and payout-to-investment ratios, on the one hand, and market capitalization and intangible intensity, on the other, have shifted in each decade from the 1950s onwards (the bottom two charts). The trends that first came to the fore in the 1980s have only become more acute. In the 2010s, the sectors which are the most profitable tend also to be those that have the highest payout-to-investment ratio, and the sectors which once dominated US industry and that gave form to post-war wage bargaining – automotives, heavy industry, and the extractive sectors – are the least profitable. Though the correlations we present should be judged with great caution given the limited number of

observations, they suggest a clear transformation within US capitalism over the past seven decades. What was once a weak negative correlation between sectoral profit margins and the payout-investment ratio has turned into a strong positive correlation; and what was once was a relatively strong negative correlation between sectoral capitalization and intangible intensity has turned into a weak positive one. To further grapple with these shifts and their macroeconomic implications, we must disaggregate the data by firm-size. This is the final step of our analysis.

[insert Figure 6 here]

Disaggregating by Size

Figure 7 reveals the uneven patterns of rentierization and intellectual monopolization in our ten sectors, according to the four parameters of concern, in terms of firm-size. Firms are ranked by revenue within each sector and stratified in the top 10%, the 5th to 9th deciles, and the bottom 50%. We see that by the 2010s the top 10% secured higher profit margins than firms in both the fifth to ninth decile and the bottom 50% in every sector, and that generally by the 2010s the gap between the profit margins of the top 10% and the bottom 50% for every sector was higher than in any of the six previous decades. In fact, in the 1950s, the difference in the profit margins of the largest and smallest firms was relatively minor. While it is true that the sample for that decade is smaller than in the following decades (see Table A3 in the supplemental materials), the minor differences in the 1950s are illustrative of the fact that the largest firms tended to pursue expansion via diversification and horizontal and vertical integration rather than profit maximization (Chandler Jr., 1990); and that in recent decades there has been a significant polarization in the profitability of large and small firms in the US.

Overall, we find that the sectors can now be differentiated in two main groups. The first group comprises sectors where the largest firms tend to be significantly more profitable and financialized than smaller firms in the same sector, but *less* intangible-intensive. The disparity in profit margins is particularly pronounced in the pharmaceutical and tech sectors, as there is an extraordinary concentration of profits for the largest companies, and a displacement of costs and risks on smaller, more intangible-intensive firms that undertake a large portion of R&D. Given the scale of the profit margin declines for the smaller groups, we created inserts so that the declines could be captured at the appropriate axis scale. Similar but much less pronounced dynamics between large and smaller firms are at play among retail as well as apparel and footwear companies. The second group comprises hospitality, food and beverage, defence, heavy industry, and extractive sectors in which – like the sectors of the

first group – the largest firms tend to be significantly more profitable and financialized than smaller firms in the sector, but – unlike the sectors in the first group – *more* intangible-intensive.

[insert Figure 7 here]

In the first group, the outsourcing by large companies of risky R&D activities appears to be particularly prominent, especially for pharma and tech companies – while for the smaller apparel and footwear and retail firms, the need to pursue brand-building and innovative design in already saturated markets raises their intangible intensity relative to their large counterparts (Rabinovich 2023). And in the second group, the extensive use of franchising by the largest hospitality companies and the widespread outsourcing of tangible production by the largest firms in heavy industry, defence, and the food and beverage sector are predominant practices – thus raising the intangible intensity of the largest firms in these sectors relative to their smaller counterparts (see Schwartz, 2022). This leaves us with one special case: the automotive sector. The auto sector is distinguished by the fact that - unlike all other sectors in this study - its largest firms have lower payout-to-investment ratios than their smaller counterparts. This suggests that despite the rise of buyer-driven value chains characterized by the dispersion of tangible production activities to myriad suppliers, the automotive sector remains primarily structured by producer-driven chains led by capital-intensive companies for which the outsourcing of core final assembly activities is limited (Sturgeon *et al.*, 2008).

How do we piece the data together and reconstruct our findings along the lines of our conceptual framework regarding rentierization and intellectual monopolization? Figures 8-10 display in color-coded fashion whether firms within each sector and size grouping rose or fell along the parameters of interest - profit margins, financial payouts relative to capital investment, market capitalization relative to GDP, and intangible intensity - for each decade compared to the last. Blue cells register an increase in terms of the parameter in question, and red cells register a fall. The only exception to this procedure is for profit margins: *wherever* the profit margin is negative it is color coded red irrespective of the direction of change. For ease of identification, where companies on average exhibit an increase in both profitability and financial payouts relative to capital investment they are colored in light turquoise to indicate rentierization, where they exhibit increased intangible intensity and market value relative to GDP, the two cells for these parameters are coloured in light blue to indicate intangible accumulation, and where they exhibit increases in all four parameters, all four cells are shaded in a darker blue to indicate intellectual monopolization.

[insert Figure 8 here]

[insert Figure 9 here]

[insert Figure 10 here]

The figures show that before the 1980s, only the top 10% of pharma companies exhibited sustained tendencies towards intellectual monopolization according to our heuristic. But since this decade, intellectual monopolization has become relatively widespread in the US. However, it is concentrated among the top 10% of companies. Perhaps surprisingly, the top 10% of tech firms only accord to our heuristic of intellectual monopolization in the 2010s. The late showing of these firms as ascendent intellectual monopolists largely derives from not only the dot-com crash in the early 2000s but also other developments in that decade which eroded profit margins. These include the continued commoditization of PCs and PC components, and competition from what were more successful lead firms from abroad such as Nokia and Research in Motion (the maker of BlackBerry). Trends within the tech sector abruptly shifted with the rapid expansion of platforms and social media in the late 2000s. This set in train dynamics around data centralization and growing network effects which propelled some of the largest US tech companies to the apex of the corporate hierarchy (Durand and Milberg, 2020; Birch *et al.*, 2021).

The Macro-Economic Implications of Variegated Intellectual Monopolization

As we emphasized at the beginning of this paper, scholarship on rentierism and intellectual monopolization has been invaluable in addressing a central puzzle within the literature on firm-level financialization: the coincidence of low capital investment and high profitability within high-income countries. We contend that the framework we develop allows us to empirically specify the mechanisms behind the profit-investment gap within high-income countries such as the US. Table 1 summarizes some of the main findings of our analysis. The tangible-intensive sectors that were central to the social compact that emerged in the US in the post-war period – automotives and heavy industry – are the only sectors that experienced a decline in their aggregate capitalization relative to GDP in the following seven decades. During their heyday in the mid-twentieth century, leading companies in these sectors had high head counts and strong commitments to capital investment. This arrangement was integral to the precariously balanced post-war industrial accord whereby the gains of economic output were relatively widely shared between capital and a privileged segment of labour through sectoral and pattern wage bargaining in which deals struck with workers within the largest companies would redound to the benefit of workers in smaller firms (Schwartz, 2022).

The sectors which have experienced the sharpest rise in relative capitalization – pharma and tech – are among the most intangible-intensive. Unlike the legacy industries of the mid-twentieth century, pharmaceutical and tech firms are much more selective in recruiting employees with high levels of ‘human capital’ and much less focused on increasing tangible assets and overall employee headcounts (Schwartz, 2022). This has geographical implications as tech and pharma firms chase synergies and spillovers by investing in areas where there is already a dense agglomeration of educational, financial and social networks such as the San Francisco Bay Area in California, Boston-Cambridge in Massachusetts, and New York-New Jersey. These investment patterns set in train employment and house price dynamics that reinforce regional inequalities in wealth and income across the US (Haskel and Westlake, 2018, pp. 136-139). Moreover, as intangible-intensity has risen so has the remuneration of those highly-educated and well-connected individuals working in corporate law, finance, consultancy and lobbying to help companies variously protect, leverage and augment their intangible assets – thus further exacerbating household inequality (Pistor, 2019; Christophers, 2021).

[insert Table 1 here]

Our analysis of the variegated dynamics of rentierization and intellectual monopolization *within* sectors also has important macro-economic implications. The most highly capitalized sectors – pharma and tech – are marked by extremely high inter-firm inequality. The leading firms in these two sectors have not only managed to minimize the outflow of knowledge through continuously guarding their intangible assets through patents and commercial secrecy but also to maximize the inflow of knowledge from subordinated innovators in hierarchically organized corporate innovation systems (Rikap, 2024). The superior capacity of lead tech and pharma companies to absorb the benefits of the innovations of other firms and to restrict these technological advances so that they do not benefit others is central to intellectual monopolization dynamics today and a core element behind current trends in underinvestment (Rikap, 2021). This strategy of selectively outsourcing some of the riskiest intangible investments to subordinated innovators is emulated within other sectors, and it is widely accompanied by another strategy of outsourcing some of the least profitable tangible investments to suppliers at home and abroad. Together these practices are best understood in terms of the processes of vertical disintegration that emerged as a consequence of financialization and shareholder value norms, not just in the tech and pharma business but all the other sectors examined in this paper. During the early post-war period, inter-firm

inequalities were much more limited than they are now, and sectoral bargaining and state-wide wage deals served to circumscribe the differential wage impacts of the inter-firm inequalities that did exist. The vertical disintegration of lead companies, the erosion of the institutions of sectoral and pattern bargaining, and the polarization of profitability within sectors has increased the effect of inter-firm inequalities in profit on household inequalities in wealth and income, engendering a winner-take-most dynamic and tendencies towards stagnation (Auvray *et al.*, 2021; Schwartz, 2022).

Conclusion

In recent years, political economists have invoked rent and intellectual monopoly to diagnose the ills of contemporary capitalism. But the concepts have been difficult to operationalize using firm-level financial data. To open up new empirical vistas, we advocate a dynamic analysis of rentierization and (intellectual) monopolization. Our analysis finds that, in the US, far from being limited to just egregious cases, rentierization and intellectual monopolization have become relatively widespread. That said, the dynamics vary significantly by sector. Trends we consider jointly sufficient to identify intellectual monopolization have been longest-running in the pharmaceutical business. But in recent years these trends have become similarly acute in the tech sector. We have also found that the relative intangible intensity across large and smaller firms differs significantly from sector to sector, depending on the specificities of the industry and their particular relationship to international dynamics as well as government policy. While the smile curve certainly captures important dimensions across supply chains that link lead firms to low-cost suppliers engaged in tangible activities abroad, only in some sectors does the smile curve have analytical purchase in the US itself. In fact, we find particularly in the pharma and tech sectors – and to a lesser extent the retail and apparel and footwear sectors – that it is the smaller firms rather than incumbent leaders that are most intangible-intensive.

From its very origins, capital accumulation has been predicated on the development of boundaries that facilitate the complete exclusion of some and the incorporation of others under conditions of subordination. The categories of rentierization and intellectual monopolization are useful in highlighting how these processes of enclosure – of simultaneously cutting off and bringing in – are articulated in the contemporary context. What we offer is a set of heuristic tools to chart how such processes can be identified in firm-level financial data. Using these heuristic tools to explore the comparative aspects of rentierization and intellectual monopolization will be a vital next step in this line of research. Our analysis of the US can be

extended to explore empirical patterns in other countries over time, across different sectors and for firms of different sizes. To what extent have other high-income countries experienced similar degrees of intellectual monopolization in recent years? And in what ways do these processes interact with the wider institutional configurations of different varieties of capitalism (Amable *et al.*, 2005; Hall and Soskice, 2001; Landini and Pagano, 2020)? Within the comparative political economy literature, financialization and intangible accumulation are often seen as inimical to the traditional bank-based financial systems found in coordinated market economies (CMEs) (Pagano, 2019). Charting these processes in CMEs may help us to better understand pressures for convergence toward equity-based financial systems. These heuristic tools can also be used to analyze dynamics in the Global South, which are fundamentally different to - yet profoundly conditioned by – the patterns of corporate power in high-income countries (Jackson, 2022).

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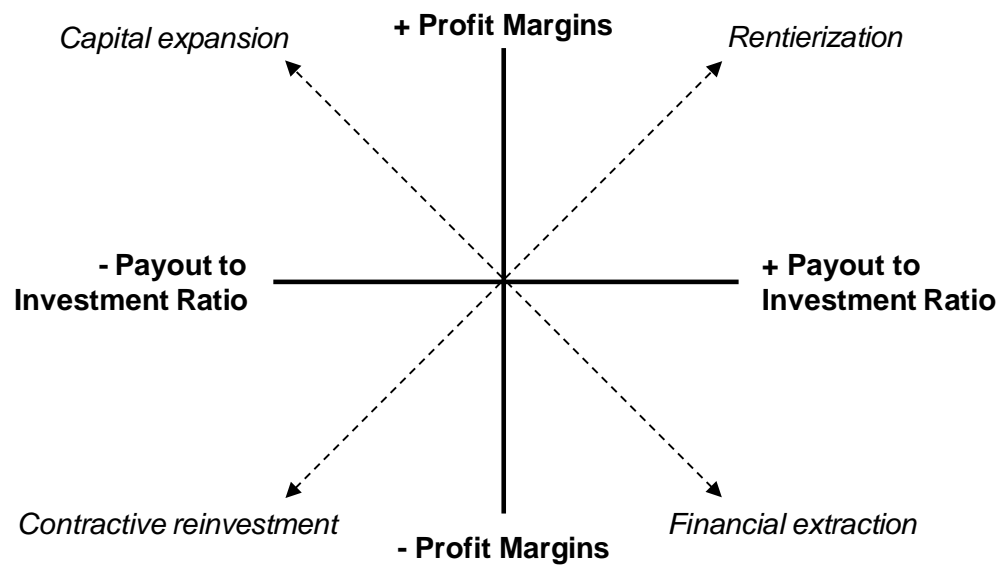


Figure 1. A Dynamic Model of Firm-Level Change: Degrees of Monopoly and Financialization

Source: Authors' elaboration

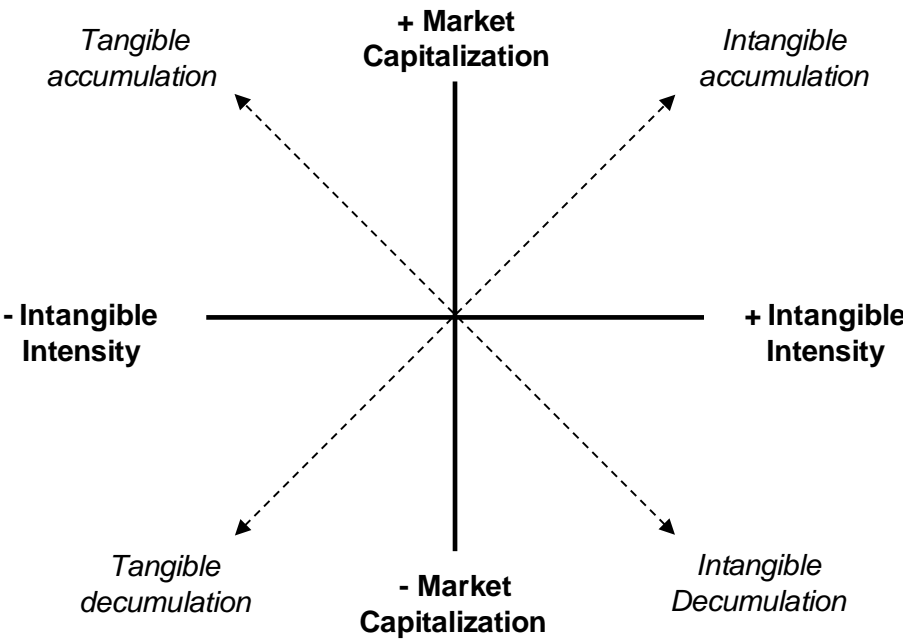


Figure 2. A Dynamic Model of Firm-Level Change: Market Capitalization and Intangible Intensity

Source: Authors' elaboration

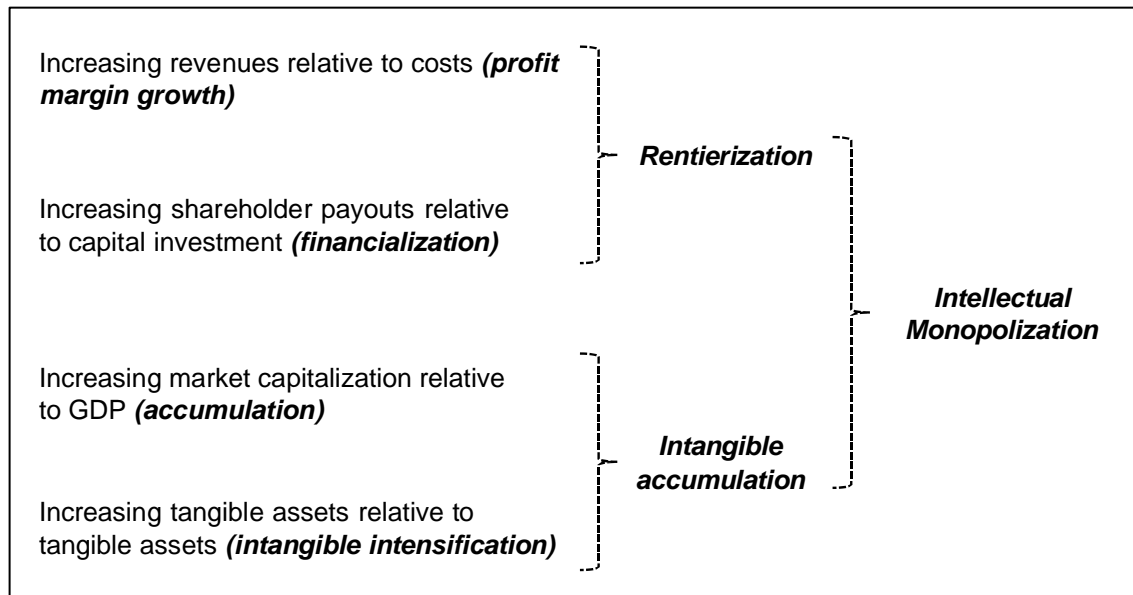


Figure 3. A Heuristic Framework for Mapping Rentierization, Intangible Accumulation and Intellectual Monopolization

Source: Authors' elaboration

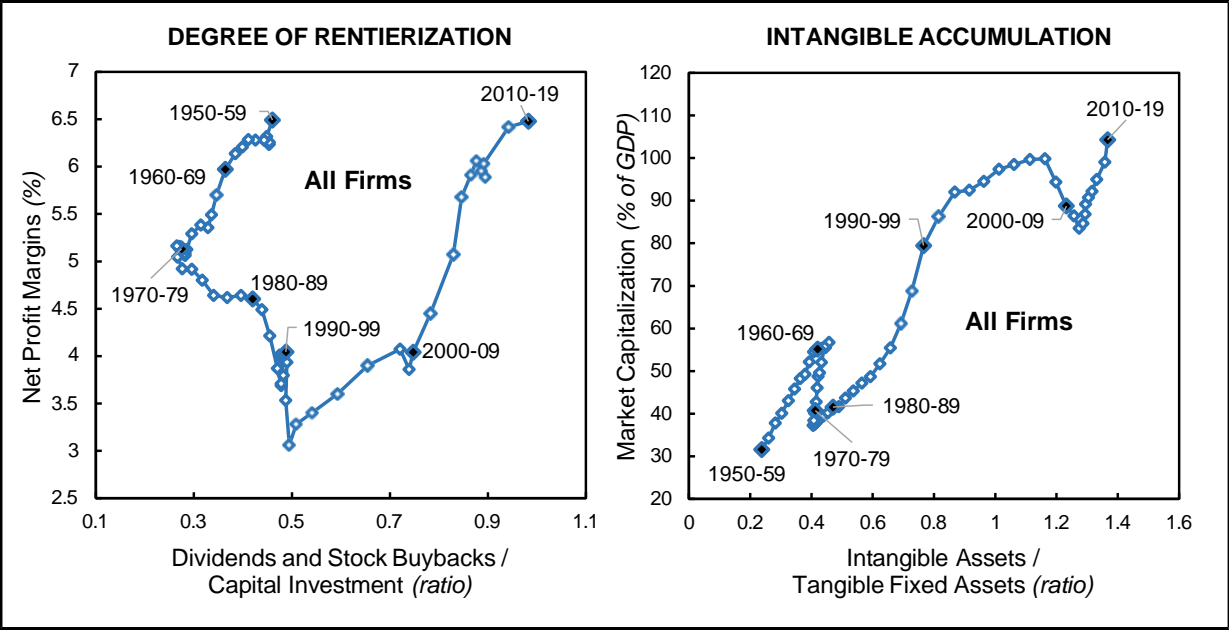


Figure 4. Rentierization and Intangible Accumulation for All US Non-Financial Firms, 1950-2019

Source: Compustat and Peters and Taylor Total Q Series through WRDS

Note: Each data point captures the average value in a ten-year window.

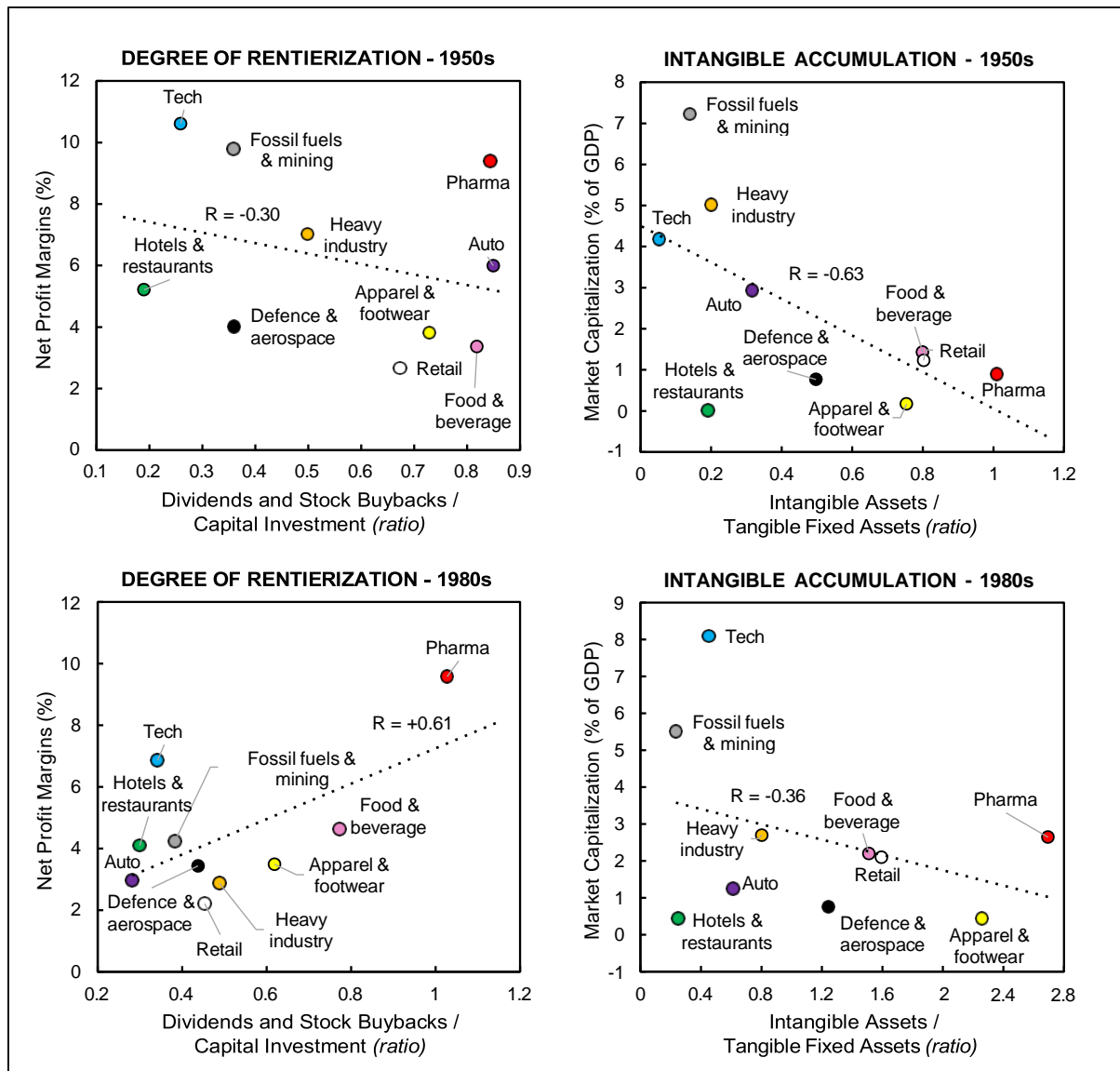


Figure 5. Degree of Rentierization and Intangible Accumulation by Sector, 1950s and 1980s

Source: Compustat and Peters and Taylor Total Q Series through WRDS

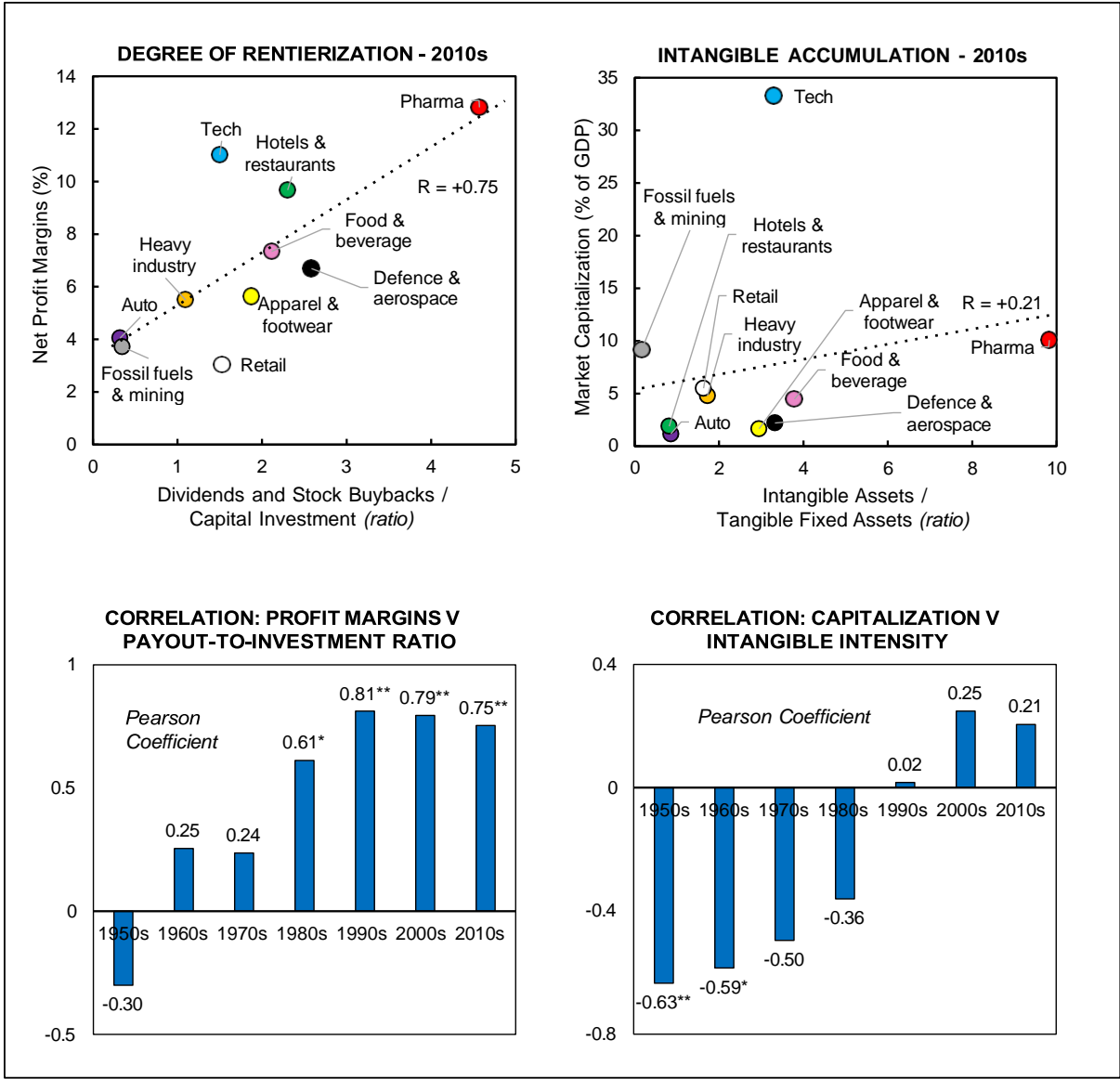
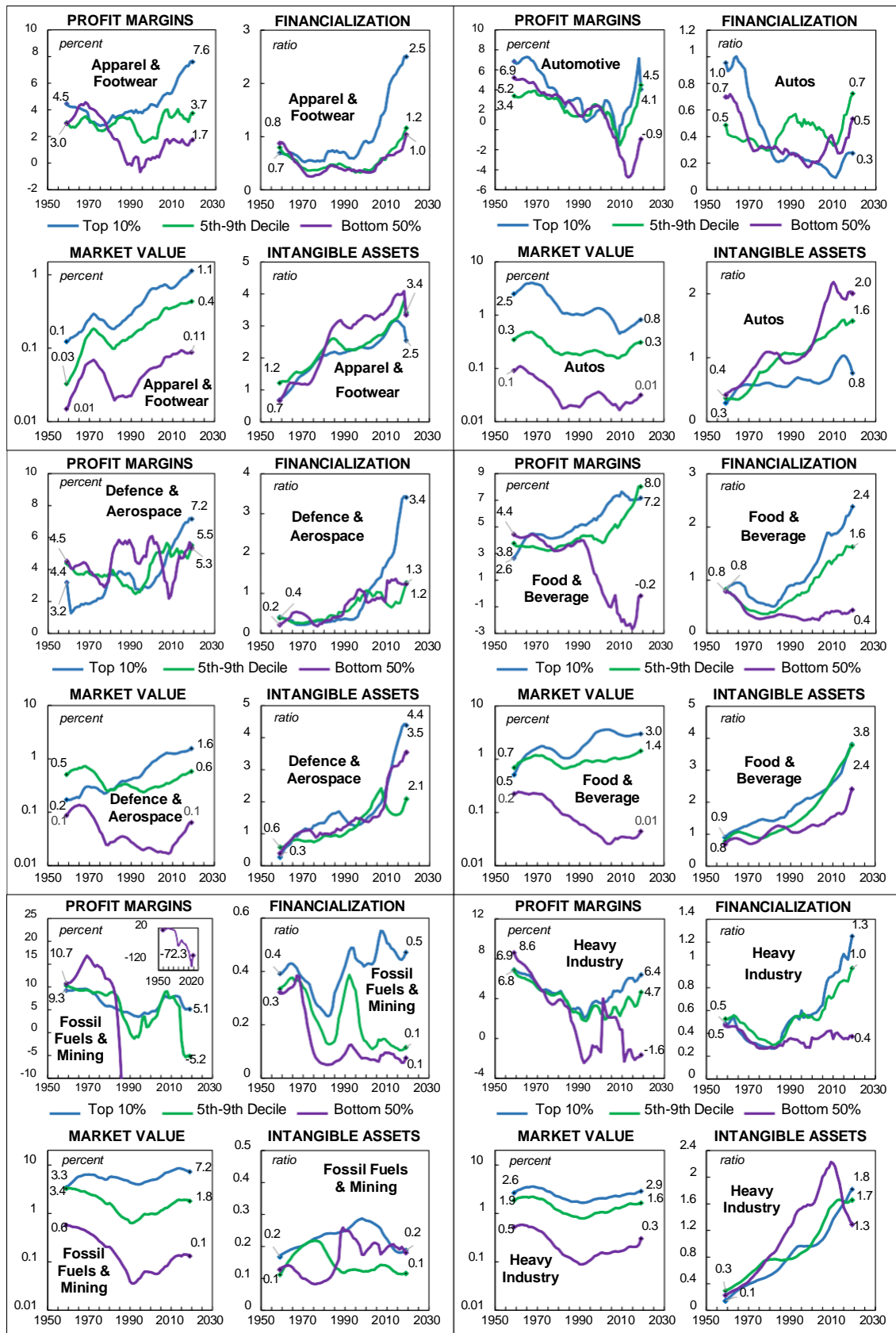


Figure 6. Degree of Rentierization and Intangible Accumulation by Sector in the 2010s, and the Correlation between Variables from the 1950s onwards

Source: Compustat (2022) and Peters and Taylor Total Q Series through WRDS

Note: ** and * denote significance at 99% ($p > 0.1$), and 95% ($p > 0.05$) levels, respectively

Figure 7. Rentierization and Intangible Accumulation for US Firms by Sector (*continued...*)

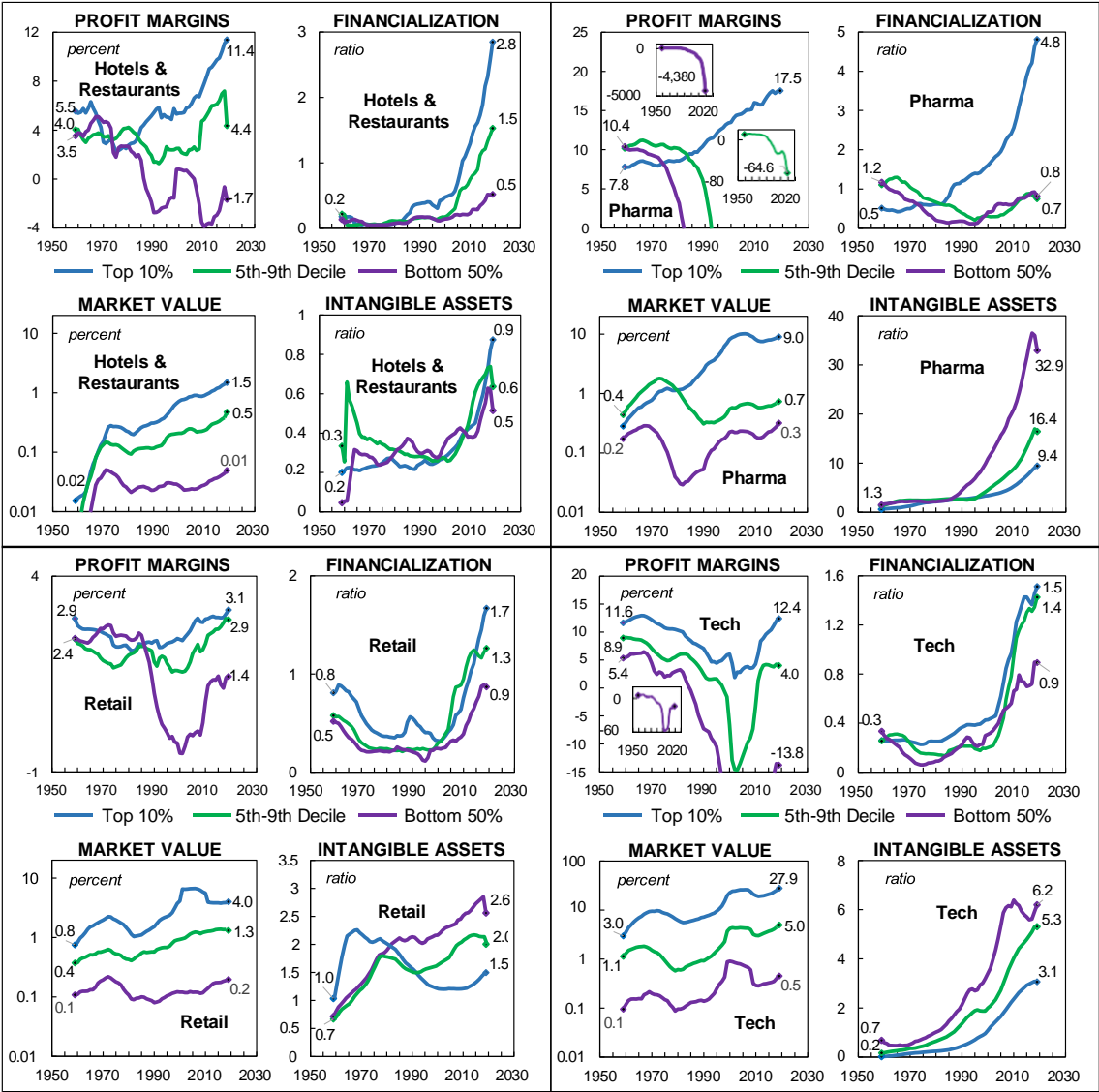


Figure 7. Rentierization and Intangible Accumulation for US Firms by Sector

Source: Compustat and Peters and Taylor Total Q Series through WRDS

Note: Each data point captures the average value in a ten-year window.

	1960s		1970s		1980s		1990s		2000s		2010s	
All	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials
	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles
Apparel & footwear	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials
	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles
Auto	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials
	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles
Defence & aerospace	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials
	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles
Food & beverage	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials
	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles
Fossil fuels & mining	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials
	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles
Heavy industry	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials
	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles
Hotels & restaurants	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials
	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles
Pharma	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials
	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles
Retail	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials
	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles
Tech	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials
	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles

Figure 8. Summary of Changes of Top 10% Firms over the Last Six Decades

Source: Authors' elaboration

	1960s		1970s		1980s		1990s		2000s		2010s	
All	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials
	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles
Apparel & footwear	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials
	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles
Auto	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials
	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles
Defence & aerospace	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials
	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles
Food & beverage	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials
	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles
Fossil fuels & mining	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials
	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles
Heavy industry	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials
	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles
Hotels & restaurants	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials
	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles
Pharma	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials
	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles
Retail	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials
	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles
Tech	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials
	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles

Figure 9. Summary of Changes of Firms in the 5th-9th Deciles over the Last Six Decades

Source: Authors’ elaboration

	1960s		1970s		1980s		1990s		2000s		2010s	
All	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials
	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles
Apparel & footwear	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials
	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles
Auto	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials
	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles
Defence & aerospace	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials
	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles
Food & beverage	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials
	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles
Fossil fuels & mining	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials
	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles
Heavy industry	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials
	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles
Hotels & restaurants	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials
	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles
Pharma	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials
	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles
Retail	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials
	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles
Tech	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials	Margins	Financials
	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles	Value	Intangibles

Figure 10. Summary of Changes of Firms in the Bottom 50% over the Last Six Decades

Source: Authors' elaboration

Change in sectoral capitalization relative to GDP, 1950s v 2010s (percentage points)	Difference in profitability between the top 10% and bottom 50% firms, 2010s (percentage points)	Difference in payout-to-investment ratio between the top 10% and bottom 50% firms, 2010s (percentage points)	Difference in intangible intensity between the top 10% and bottom 50% firms, 2010s (percentage points)
Large increase Tech (+29.1) Pharma (+9.2)	Large firms much more profitable Pharma (+4,397.5) Extractive (+77.4) Tech (+53.6)	Large firms much more financialized Pharma (+4.1)	Large firms much less intangible-intensive Pharma (-33.5)
Moderate increase Retail (+4.3) Food & beverage (+3.0) Extractive (+1.9) Hospitality (+1.9) Fashion (+1.5) Defence (+1.4)	Large firms moderately more profitable Hospitality (+14.6) Food & beverage (+11.2) Fashion (+5.9) Automotive (+5.4)	Large firms moderately more financialized Hospitality (+2.3) Defence (+2.2) Food & beverage (+2.0) Fashion (+1.5)	Large firms moderately less intangible-intensive Tech (-3.1) Auto (-1.2) Retail (-1.1) Fashion (-0.9)
Decline Heavy Industry (-0.2) Automotive (-1.8)	Large firms slightly more profitable Heavy Industry (+4.8) Defence (+2.2) Retail (+1.7)	Large firms slightly more financialized Heavy industry (+0.9) Retail (+0.8) Tech (+0.6) Extractive (+0.4) Large firms less financialized Automotive (-0.4)	Large firms more intangible-intensive Defence (+2.3) Food & beverage (+1.4) Heavy industry (+0.5) Hospitality (+0.4) Extractive (+0.1)

Table 1. Summary of Findings

Source: Compustat and Peters and Taylor Total Q Series through WRDS

Supplemental Online Materials

Table A1 contains information on the key Compustat variables used in the study and the filtering procedures for dealing with missing observations. To filter out the financial sector, we have excluded all firms with a Standard Industrial Classification (SIC) code starting with '6'. Furthermore, to filter out all foreign corporations we have only included firms with an ISO country code for their headquarters (LOC) of 'USA' and with a company currency code (CURCD) of 'USD'. As shown in Table A1, to remove problematic entries, we have excised all observations for a firm in any given year that records negative values for revenues, and we have dropped all firm-year observations with missing data for any of our variables other than intangibles, dividends and share repurchases as shown in Table A1. Table A2 lists the Standard Industrial Classification (SIC) codes used for sector construction, and Table A3 shows the decennial average sample size of firms for each sector.

Data item (mnemonic)	Exclude firm from a given year if variable observation missing, or impute zero to the variable?
Dividends – Total (dvt)	Impute Zero
Purchase of Common and Preferred Stock (prstk)	Impute Zero
Intangible Capital (k_int)	Impute Zero
Net Income (ni)	Exclude
Revenue – Total (revt)	Exclude
Capital Expenditures (capx)	Exclude
Common Shares Outstanding (csho)	Exclude
Price Close Annual (prcl_c)	Exclude
Property, Plant and Equipment – Total (Net) (ppent)	Exclude

Table A1. Filtering Procedures

Sector Name	SIC codes
Apparel and footwear	2250-2254, 2300-2389, 3021, 3131-3151, 5600, 5621, 5651, 5661
Autos	3711-3716
Defence and aerospace	3480, 3720-3728, 3760-3769
Food and beverage	3480, 3720-3728, 3760-3769
Fossil fuels and mining	1000-1400, 2911, 2990
Heavy industry	2800, 2810, 2860, 2870, 1520-1731, 3241-3412, 3443-3448, 3490-3569, 3612-3621
Hotels and restaurants	5810, 5812, 7000, 7011
Pharma	2833-2836, 3845
Retail	5200-5990 (except 5810, 5812, 5961)
Tech	3570-3579, 3661-3679, 5961, 4812-4822, 4841-4899, 7370-7377, 7841

Table A2. Sector Construction

	1950s	1960s	1970s	1980s	1990s	2000s	2010s
All	512	1430	3345	4579	5532	4979	3760
Apparel	13	53	149	123	141	115	70
Autos	17	38	66	61	75	57	50
Defense and aerospace	17	32	49	42	36	41	32
Food and beverage	55	105	159	118	130	111	96
Fossil fuels and mining	34	80	192	384	300	300	322
Heavy industry	113	261	470	478	507	394	311
Hotels and restaurants	3	18	74	117	137	98	70
Pharma	16	28	55	167	387	503	572
Retail	33	98	227	223	235	163	116
Tech	23	89	285	695	1162	1239	776

Table A3. Average Annual Sample Size (Number of Firms)

In compiling our dataset, we faced a dilemma as to whether to include zero-revenue companies. These firms were up until the 1970s entirely absent from Compustat universe, but from the 1980s they increased in number and now comprise 9% of the companies included in the dataset. Zero-revenue companies are usually early-stage enterprises engaged in research and development that have yet to launch their products or services. They have proliferated in recent years due to regulatory changes which have made it easier for firms to become listed on stock exchanges, and the expansion of funding from venture capital and other sources of

start-up financing (Orsi and Coriat, 2006). Since these firms can often play a key, but nonetheless often subordinate, part in corporate innovation systems we deemed them worthy of inclusion. Additionally, through comparing the data for the Bottom 50% of companies with and without these firms, we found that across all four parameters in our study, there was little difference in the results (see Table A4). Therefore, the inferences we draw from our data would remain unchanged even if we elected to omit these zero-revenue firms.

As indicated in the manuscript, the apparent decline in intangible intensity in the 1970s presented in Figure 4 is actually the result of the introduction of many tangible-intensive utility companies in the dataset. We see in Figure A1 below that once these utility companies have been removed from the dataset, no reduction in intangible intensity is evident in the entire period of analysis. Beyond this, the removal of these utility firms from the dataset does not substantively change the results for the other three parameters of our analysis (net profit margins, payout-to-investment ratio, and market capitalization as a % of GDP).

One final wrinkle in the Compustat data is the absence of values for share repurchases until 1971. However, stock buybacks in the 1950s and 1960s were not the key driver of shareholder returns in the US that they are today. According to the figures of Leo Guthart ([1967](#)) (cited by [Joseph von Zanten \(2022\)](#)), stock buybacks amounted to \$300 million for all US-listed firms in 1954, but that's just roughly 6% of the \$4.9 billion spent on dividends by non-financial firms in our dataset for that year. Similarly, while Von Zanten reports that \$1.3 billion was spent on stock buybacks in the US in 1963, this is just 13% of the \$10.4 billion spent on dividends by non-financial firms in our dataset for that year. Finally, by 1971, the first year for which we have data for both dividends and stock buybacks, we find that share repurchases amounted to just \$1.3 billion – just 7% of the \$18 billion spent on dividends (by 2019, the value of stock buybacks exceed dividends by 56% in our dataset). The lack of data on stock buybacks prior to 1971, therefore, does not grossly exaggerate the low payout-to-investment ratio that Figure 4 presents for the 1950s and 1960s.

	Average annual number (percentage) of zero-revenue firms	Bottom 50% average market value with (and without) zero-revenue firms (USD millions)	Bottom 50% percentage net profit margins with (and without) zero-revenue firms	Bottom 50% financialization ratio with (and without) zero-revenue firms	Bottom 50% intangible intensity with (and without) zero-revenue firms
Apparel & footwear					
1980s	1 (0.2)	15.8 (15.9)	0.0 (0.0)	0.38 (0.38)	3.07 (3.06)
1990s	1 (0.4)	55.6 (54.3)	0.2 (0.9)	0.33 (0.34)	3.32 (3.25)
2000s	1 (0.9)	179.3 (182.5)	1.7 (1.7)	0.60 (0.60)	3.43 (3.43)
2010s	1 (0.1)	478.5 (480.3)	1.7 (1.8)	1.04 (1.04)	3.35 (3.34)
Automotive					
1980s	1 (0.1)	28.2 (28.1)	1.6 (1.6)	0.27 (0.27)	0.90 (0.90)
1990s	0 (0)	77.7 (77.7)	2.6 (2.6)	0.18 (0.18)	1.07 (1.07)
2000s	1 (0.9)	77.8 (77.8)	-2.6 (-2.5)	0.42 (0.42)	2.16 (2.13)
2010s	2 (3.8)	250.7 (264.1)	-0.6 (-0.4)	0.52 (0.51)	1.97 (1.96)
Defence & aerospace					
1980s	0 (0)	67.6 (67.6)	6.0 (6.0)	0.46 (0.46)	1.19 (1.19)
1990s	1 (2.2)	94.4 (96.9)	5.8 (6.6)	1.00 (1.00)	1.38 (1.37)
2000s	2 (4.2)	117.9 (128.0)	2.7 (3.1)	0.76 (0.75)	2.09 (2.06)
2010s	1 (0.9)	775.6 (782.6)	5.3 (5.3)	1.18 (1.18)	3.48 (3.48)
Food & beverage					
1980s	2 (0.8)	49.9 (49.4)	3.9 (3.9)	0.33 (0.33)	1.14 (1.14)
1990s	1 (0.8)	46.0 (46.8)	0.9 (1.1)	0.26 (0.26)	1.22 (1.22)
2000s	3 (2.4)	82.8 (85.7)	-1.6 (-1.5)	0.39 (0.39)	1.52 (1.51)
2010s	5 (4.8)	191.7 (205.0)	0.2 (0.5)	0.46 (0.46)	2.37 (2.37)
Fossil fuels & mining					
1980s	11 (2.8)	12.5 (12.5)	-40.0 (-36.5)	0.08 (0.08)	0.26 (0.26)
1990s	14 (4.8)	31.7 (31.6)	-31.4 (-28.6)	0.08 (0.08)	0.17 (0.17)
2000s	38 (12.6)	79.5 (84.3)	-55.7 (-44.0)	0.10 (0.10)	0.19 (0.17)
2010s	56 (17.4)	152.0 (160.5)	-71.2 (-59.2)	0.07 (0.08)	0.18 (0.17)
Heavy industry					
1980s	4 (0.9)	17.6 (17.8)	-0.2 (-0.1)	0.35 (0.35)	1.24 (1.23)
1990s	9 (1.7)	42.6 (43.2)	-1.1 (-1.1)	0.27 (0.26)	1.57 (1.55)
2000s	15 (3.7)	110.8 (113.8)	0.9 (1.4)	0.43 (0.44)	2.24 (2.23)
2010s	11 (3.5)	369.8 (392.2)	-1.5 (-1.3)	0.38 (0.38)	1.30 (1.30)
Hotels & restaurants					
1980s	1 (0.4)	17.0 (17.1)	-1.2 (-1.2)	0.17 (0.17)	0.31 (0.31)
1990s	1 (0.8)	31.6 (31.7)	-1.4 (-1.7)	0.13 (0.12)	0.32 (0.32)
2000s	2 (1.8)	72.4 (74.6)	-2.1 (-2.0)	0.21 (0.21)	0.38 (0.38)
2010s	2 (2.4)	221.7 (232.2)	-0.8 (-0.8)	0.52 (0.52)	0.52 (0.52)
Pharma					
1980s	10 (4.0)	26.5 (25.2)	-62.1 (-55.2)	0.18 (0.19)	4.48 (4.22)
1990s	30 (7.8)	76.0 (74.9)	-336.4 (-278.4)	0.33 (0.31)	10.85 (10.27)
2000s	59 (11.8)	105.3 (107.0)	-915.4 (-752.9)	0.61 (0.50)	21.14 (19.81)
2010s	146 (25.5)	193.8 (166.8)	-4317 (-1995)	0.81 (0.73)	23.43 (21.87)
Retail					
1980s	0 (0.4%)	33.0 (33.1)	1.4 (1.4)	0.22 (0.22)	2.14 (2.14)
1990s	1 (0.7%)	78.1 (77.9)	-0.3 (-0.2)	0.24 (0.24)	2.17 (2.17)
2000s	1 (1.7%)	192.6 (196.3)	0.3 (0.3)	0.36 (0.36)	2.52 (2.52)
2010s	2 (2.9%)	623.6 (643.1)	1.4 (1.5)	0.87 (0.87)	2.01 (2.01)
Tech					
1980s	7 (0.8)	18.1 (18.2)	-6.0 (-6.1)	0.21 (0.20)	1.94 (1.87)
1990s	17 (1.5)	94.9 (97.3)	-26.5 (-26.0)	0.30 (0.30)	3.19 (3.19)
2000s	35 (2.8)	66.7 (69.3)	-46.0 (-43.9)	0.56 (0.58)	6.12 (6.30)
2010s	29 (3.8)	222.4 (236.0)	-13.8 (-13.5)	0.89 (0.70)	6.21 (6.16)

Table A4. The Number and Percentage of Zero-Revenue Firms in the Dataset and Results With and Without their Inclusion (By Sector)

Source: Compustat (2022) and Peters and Taylor (2019).

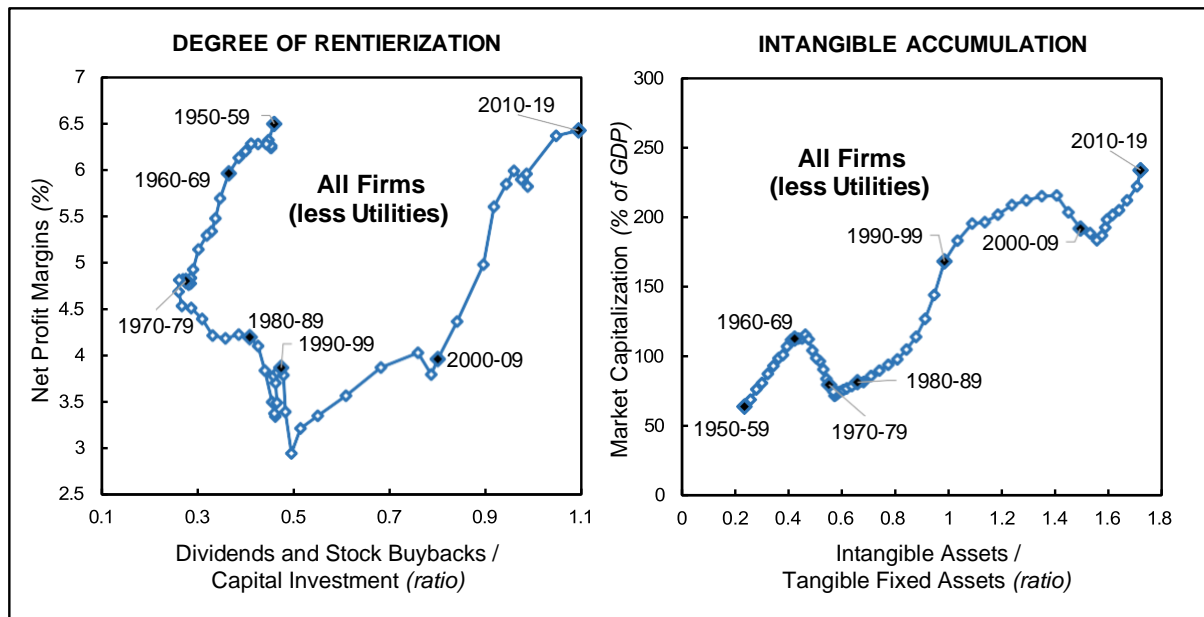


Figure A1. Rentierization and Intangible Accumulation for All US Non-Financial Firms (Less Utility Firms), 1950-2019

Source: Compustat and Peters and Taylor Total Q Series through WRDS

Note: Each data point captures the average value in a ten-year window.