Wealth and Secular Stagnation: The Role of Industrial Organization and Intellectual Property Rights

Abstract:
What are the sources and consequences of rising wealth inequality in America? The combination of (1) the use of state created monopolies around intellectual property rights (IPRs) for profitability with (2) firm level strategies to transform their industrial organization by pushing physical capital and non-core labor outside the boundaries of the firm (3) leads to rising levels of wealth and income inequality among firms as well as individuals. Income inequality among firms in turn (4) reduces growth in productive investment and thus in aggregate demand. Slower growth reflexively firms from investment, aggravating the shortfall in aggregate demand. Decreased protection for IPRs and increased protection for subcontracted workers would help increase aggregate demand and thus push growth back to its prior level, as well as reducing wealth and income inequality.

Key words: inequality, industrial organization, intellectual property, profits

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Acknowledgements: The author would like to thank John Echeverri-Gent, Lindsay Flynn, Peter Hall, Ronen Palan, and Bent Sofus Tranøy for comment and criticism. Earlier versions presented at Russell Sage Foundation, the University of North Carolina, and the Batten School of Public Policy also benefited from audience comments and questions. Responsibility remains with me.

Wealth and Secular Stagnation: The Role of Industrial Organization and Intellectual Property

What explains rising economic inequality, particularly wealth inequality? What is the connection between rising economic/wealth inequality and secular stagnation? The other analyses in this special issue all answer these questions using econometric techniques to tease out how specific individual or household characteristics like, for example, marital status, incarceration, or geographic location contribute to wealth outcomes, or they present a series of snapshots for the distribution of wealth and consumption. These analyses are valuable, providing targets for narrow policy interventions and information for future studies. But unless it is inherited, individual wealth has to come from somewhere
in the economy, and the faster economic growth is the more likely it is that rising employment and income drive rising individual and household wealth for the broad population. This article thus looks at firms and the macro-economy to complement the other studies. Firms are the ultimate source of income and wealth. They provide most of the net productive investment that generates the growth that validates wealth, which, after all, is simply a claim on future production. A stably expanding full employment economy enables individual households to accumulate wealth. By contrast, as Wolff’s article (this issue) shows, macroeconomic instability and stagnant growth after 2007 contributed to falling wealth outside of a narrow slice of US households.

Analyses pointing to rising household inequality as the source of macroeconomic stagnation posit a relatively simple mechanism. Higher income individuals have a lower marginal propensity to consume. This lower propensity to consume plausibly reduces aggregate demand, slowing growth. But this answer is self-evidently incomplete. First, as noted, it doesn’t explain where household income comes from and why income inequality has been rising. Second, it ignores other important parts of aggregate demand. Conventionally, GDP is the sum of \( C + G + I + (X-M) \), that is, consumption, government spending on goods and services, investment and net exports. The change or delta (\( \Delta \)) in GDP is the sum of the various changes in each of these four components. Consumer spending unquestionably constitutes the bulk of demand in the US economy, ranging from 65 to 70% of GDP in any given year in the past four decades. But the other 30 to 35% is hardly residual. Indeed, given the inevitable decline in household income during a recession, the whole point of counter-cyclic fiscal policy is to boost non-transfer government spending (create positive \( \Delta G \)) and the whole point of monetary policy is to boost investment (create positive \( \Delta I \)) to compensate for that decline.

When Keynes wrote, the vast majority of households lived from paycheck to paycheck, so it was obvious that household consumption was a secondary factor in the formation of new income. This is less true today, given the availability of credit and the modicum of assets the average household owns. Still, recent survey data suggest that about 60% of US households have less than $1000 in liquid savings and that one third of those households lack even a bank savings account. For most households, then, credit is a buffer against falling income rather than a net increase. In the other 40% of households, most credit is mortgage credit, but conventionally new housing construction is categorized as a fixed investment. Consequently, investment and government spending still dominate because they constitute the majority of net new spending, and it is this delta that matters for growth.

Moreover, to the extent that we live in a world of rising household income inequality (Piketty and Saez, 2006), the lower marginal propensity to consume at the top of the income pyramid should generate additional savings that flow into some sort of investment. Because investment growth is unusually weak and at historically low levels, this raises an interesting question: why doesn’t the extra saving by higher income households translate into growth promoting investment? The annual increase in US private fixed non-residential investment after 2001 has been substantially slower than the prior decade, aside from the rebound year of 2012. Moreover, the absolute level of investment is also flat. Obviously, the housing bubble has something to do with that: Real gross residential fixed investment in 2014 still only approximated the absolute level of spending in 1993. But corporate investment has also been tepid. As of December 2014, the absolute level of gross private fixed investment net of residential construction was only 10% above its 2007 level in real terms, net investment (which matters more) was 8% below the 2007 peak, and both were below trend.¹ Corporations translate household savings into actual productive investment, so corporate difﬁdence with respect to investment pushes household savings into non-productive channels.

¹ Bureau of Economic Analysis, Table 5.2.6. Real Gross and Net Domestic Investment by Major Type, Chained dollars, lines 1, 3, 10, 12, 22, and 24, downloaded 12/21/2015.
Government spending growth is just as tepid as corporate investment growth. Absolute US government spending at all levels is roughly at the same level as in 2005 in real terms, has (understandably) fallen from its peak during the Obama stimulus period, 2010-2011, and is at historic lows as a share of GDP.² As with the tepid investment response to historically low interest rates, there is an important corporate component to government fiscal restraint. The last thirty years have seen concerted political pressure from conservative parties everywhere to restrain government deficits. To the extent that revenue growth is weak, so too spending growth. Tax cuts obviously constrain revenues. But corporate tax avoidance schemes that allocate profits to entities in tax havens also constrain revenue (Zucman 2015). As of 2015, the 500 largest US firms held $2.1 trillion offshore, avoiding an estimated $620 billion tax liability (Citizens for Tax Justice 2015). By way of comparison, the 2010-2011 Obama economic stimulus package amounted to $831 billion, suggesting that a stimulus-worth of untapped revenue sits idle.

This article thus tries to explain rising inequality in household income and wealth, and the apparent inability of monetary policy to spark growth in investment, by looking at inequality in corporate income (i.e. profit) and wealth (i.e. market capitalization). Secondarily – because profits must be earned before they can be sequestered in tax havens – it looks at the limits to fiscal policy created by firms’ use of tax havens. Put simply, rising income (i.e. profit) and wealth inequality among firms is what drives both rising individual income and wealth inequality and the tepid investment response to the greatest monetary stimulus in US history.

Inter-firm inequality arises from changes in US firms’ strategy and structure. Firms’ strategies for profitability increasingly depend on legally constituted monopolies, particularly but not exclusively the patent and copyright system, and intangible assets and regulatory monopolies more generally. These strategies use intellectual property rights (IPRs) to extract monopoly rents from other firms and consumers, producing inter-firm inequality of profits. Firms’ structure has also changed in response to financial market pressure to maximize shareholder value – that is, return on assets. This pressure forces and/or induces firms to pursue industrial organization strategies that shift labor and physical assets outside the legal boundaries of the firm, producing individual level inequality and weakening the rate of growth of consumption. Shifting physical assets outside the firm means that firms with strong IPR positions accumulate monopoly rents but have no incentive to invest back in the real economy, weakening investment growth. Shifting labor outside firms with strong IPRs or other monopoly positions and into firms with no ability to extract rents produces rising household income inequality because firms with higher profits also pay higher wages (Bloom et al., 2015). On one side are firms in highly competitive markets whose profitability depends on depressing wages; on the other side are firms accruing monopoly rents and sharing part of those rents with their increasingly smaller slice of the total workforce.

Inter-firm inequality dampens investment; inter-personal inequality dampens demand; these combine to generate secular stagnation by decreasing the net increase in consumption and investment. Slow growth intensifies pressure on politicians to pursue self-defeating strategies of austerity, weakening growth of government spending. Though these processes do not explain everything about modern inequality or slower growth, they do suggest that a significant part of that inequality and stagnation is neither inevitable nor irremediable. Because rising inequality stems from the combination of state constituted monopolies and changes in industrial organization, public policy can address at least part of the problem of rising wealth and income inequality.

² Bureau of Economic Analysis, Table 1.1.6. Real Gross Domestic Product, Chained Dollars, line 22, downloaded 12/21/2015. Similarly, Eurozone(19) general government spending was only 3.5% higher in real terms in 2014 as compared with 2008 (Eurostat data explorer, http://ec.europa.eu/eurostat/data/database).
This article thus has five sections. Section one presents the argument about secular stagnation, highlighting Keynes’ arguments about the liquidity trap and inadequate aggregate demand. Section two demonstrates the inequality in firms’ profitability, and the links to IPRs. Section three discusses firms’ reliance on IPRs and other monopolies created through regulation, and the changes in industrial organization. Section four looks at how these changes explain part of the weak growth in C, G and I. Section five concludes and offers some policy recommendations for remediating both inequality and secular stagnation.

Secular Stagnation?

Growth in the US economy slowed markedly in the 2000s relative to prior decades. The decades of the 1970s, 1980s and 1990s all saw real GDP and real per capita GDP increase by roughly 37% and 24% respectively over each decade, including the often lamented 1970s. But these growth rates halved after 2000. US growth rates remained among the highest for the 22 rich OECD countries, which suffered an even greater slow down in aggregate GDP but less so per capita GDP growth. Worse, from 2009 to 2014, out of a total of 132 possible country-years for these 22 countries, there were only 6 years with no output gap, and the OECD as a whole has had a persistent output gap over 2% of GDP. Is this slow down and the past decade in particular a case of secular stagnation? Strictly speaking, secular stagnation arises from insufficient aggregate demand. Arguments positing a supply side basis for slow growth are not, strictly speaking, secular stagnation arguments. While I offer an aggregate demand based argument, the supply side arguments for slow growth need to be taken seriously, and accommodated in an argument that stresses demand side factors. Focusing on the wealth and income distribution effects of IPRs allows us to combine important supply and demand side factors.

Robert Gordon (2012; 2014) makes the most robust supply side arguments (though Gordon [2012] shades into demand side arguments). Gordon argues that the US and other rich OECD economies have exhausted the stock of truly revolutionary technologies. Flush toilets matter more than flash telephones, in the sense that new technology yields diminishing returns in productivity by comparison to the once-only technological breakthroughs of the 1850-1950 century. This explains the productivity and thus growth slowdown that started in the 1970s. In addition, slower population growth also slows aggregate GDP growth, although its effects on productivity are less obvious. Dismissing optimists like Markillie (2012), Brynjolfsson and McAfee (2014), and Rüßmann, et al. (2015), Gordon suggests that the natural rate of productivity growth will revert to its historic level of about 0.25 to 0.33% per year over rest of the century.

Gordon’s argument comports with Joseph Schumpeter’s (1938; 1942) arguments about the importance of clusters of radical innovation for igniting growth. Schumpeter argues that without a cluster of radical innovations, growth settles into a “circular economy” pattern in which profits are sufficient to cover depreciation and managerial salaries for owners, but per capita growth is nugatory. For Schumpeter, rapid growth requires bold entrepreneurs, and entrepreneurs require the prospect of monopoly rents to propel them into action. Indeed, unlike most neo-classical economists, Schumpeter (1942, 83) explicitly praises monopoly:

A system – any system, economic or other – that at every given point of time fully utilizes its possibilities to the best advantage may yet in the long run be inferior to a

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3 That is, the United States, Canada, Japan, Korea, Britain, Ireland, France, Germany, Italy, Austria, Spain, Portugal, Switzerland, Netherlands, Belgium, Denmark, Finland, Norway, Sweden, Luxembourg, Australia and New Zealand.

4 OECD, Economic Outlook 2015-2, appendix table 10.

5 Schumpeter’s circular flow economy thus differs from the Ricardian stationary economy in its assumption that incremental innovation occurs.
system that does so at no given point of time, because the latter’s failure to do so may be a condition for the level of speed of long-run performance.

The possibility of radical innovations in product and process creates the possibility for quasi-monopoly rents for firms at the technology frontier; the prospect of rents catalyzes credit creation to bring those technologies to market. Schumpeter expects these rents to dissipate over time, throwing the economy back into a circular flow state. Yet if Gordon is right, then, as I will show later, we currently see Schumpeterian rents without (significant) innovation or growth. And if Schumpeter is right, then Gordon is mistaken about the growth and investment implications of the new technologies identified by the authors two paragraphs above. To re-phrase Solow about this paradox, why does the current round of technological innovation show up in profitability but not the productivity statistics, and why is there an apparent disconnect between innovation, rents and investment levels? Keynes suggests some demand side answers to these questions.

The shortest possible version of Keynes’ (1936) General Theory is that the economy possesses multiple stable equilibrium states rather than one optimal state posited by neo-classical economics. At one extreme is a high investment, high wage, high demand equilibrium that generates high profits, high employment, and high growth. The other extreme is a low investment, low wage, low demand equilibrium that generates low profits, low employment, and low growth, rather like Schumpeter’s circular economy. Keynes divided demand up into two components. ‘D1’ connoted household consumption (C in modern GDP accounting), which, as noted above, Keynes assumed was relatively stable given households’ lack of access to credit or savings and also because of the ‘stickiness’ of wages. ‘D2’ connoted demand for investment goods (I in modern GDP accounting), which both suffered from volatility and, when rising, provided for a powerful increase in demand through its multiplier effects. So Keynes anticipated the later division of demand into C + G + I, given that his solution for weak C + I was an increase in government spending.

The essential mechanism maintaining Keynes’ lower equilibrium is not so much feeble entrepreneurs – though fear does deter investment – but rather rational responses to slow or slowing growth. Firms facing weak demand would not invest, for fear of creating over-capacity and decreased profits. Instead, whatever profits they generated would simply accumulate in banks. This reduction in ‘D2’ or I would create a self-sustaining, slack economy in which low demand deterred new net investment, and which low new net investment in turn assured continued low demand. In this economy savings pile up, producing low interest rates, but low interest rates fail to induce new investment given weak demand and investor fear. This is the essence of the liquidity trap. Keynes (1936, ch. 2, s. VI) puts this succinctly:

Those who think [that savings automatically get productively invested] are deceived, nevertheless, by an optical illusion, which makes two essentially different activities appear to be the same. They are fallaciously supposing that there is a nexus which unites decisions to abstain from present consumption [i.e. saving] with decisions to provide for future consumption [i.e. productive investment]; whereas the motives which determine the latter are not linked in any simple way with the motives which determine the former.

Moreover, while an individual act of saving seemingly increases the potential pool for investment, that saving – in the absence of an automatic mechanism producing investment – subtracts from demand, leading to a decrease in someone else’s income and thus diminishing the total pool of savings available for investment. Declining investment produces declining savings, as Wolff’s (this issue) data show. Keynes saw the central economic problem as assuring that investment grew, and equally

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6 Serial entrepreneur (PayPal, Palantir) Peter Thiel (2014) recently popularized this argument in Zero to One.

7 See in particular chapter 16.
important grew consistently, in order to maximize employment. Where Schumpeter (1947) argued that
the state should get out of the way of heroic entrepreneurs sparking a new round of growth through
innovation, Keynes argued that the state had to inject demand into the economy, encouraging risk
averse firms to invest rather than pile up cash. This visibly increased demand would calm Keynes’
timorous entrepreneurs and induce matching private investment. The strong multiplier effects of state
sponsored investment would provide the new goods and services needed to absorb the initial injection
of money and thus prevent inflation. They would also generate the income needed to supply savings for
this new investment. State sponsored investment thus had public goods aspects (as indeed does all
productive investment and credit creation).

As with Theil’s and Gordon’s up-dating of Schumpeter, Keynes’ arguments also have modern
carriers, as in Lawrence Summers’ (2013) revival of Hansen’s (1939) secular stagnation arguments.8
Summers’ analysis, however, largely concentrates on low nominal interest rates as an indicator of excess
savings. Like Keynes, he sees the zero-bound as an impediment to policy making (because monetary
authorities cannot push nominal rates below the zero-bound).

The ‘new secular stagnation hypothesis’ responds to recent experience and the manifest
inadequacy of conventional formulations by raising the possibility that it may be
impossible for an economy to achieve full employment, satisfactory growth, and
financial stability simultaneously simply through the operation of conventional
monetary policy (Summers 2014, 29).

Schumpeter’s and Keynes’ analyses seem somewhat at odds on the current situation. On the
one hand, low interest rates should crowd investment into highly promising technologies. Indeed this
seems to be the case with Silicon Valley’s ‘unicorns’ – software based firms with private or public equity
market valuations over $1 billion that promise to capture enormous monopoly rents (e.g Uber, Flipkart,
Delivery Hero). Moreover, contra Keynes, profits appear to be at secular highs. According to McKinsey
Global Institute (Dobbs, et al., 2015) global firms’ net income after taxes and interest payments rose by
a factor of five from 1980 to 2013, and tripled before taxes and interest.9 The share of profits in global
GDP also rose from 7.6 percent to 9.8 percent from 1980 to 2013; for US firms, profits after tax rose
from an average of 4.2% of gross domestic income in the 1980s to 6.1 percent in the decade to 2014
(Dobbs, et al., 2015; FRED).

On the other hand, despite this profitability and extremely low interest rates, ever more cash
seems to be piling up in (some) firms’ hands without generating much Schumpeterian investment. Low
interest rates have facilitated increased US corporate borrowing, but this debt is not used for real
investment. Instead, US firms have poured more money into stock buybacks and dividends than into
fixed investment, and have parked vast sums in tax havens. Mason (2015, 19) reports that each
additional dollar of corporate earnings or borrowing yielded only 10 cents of investment in the 2000s,
versus 30 to 40 cents the 1960s. In principle, money returned to households via share buy backs could
be channeled into investment by other firms. In practice, given the massive inequality in household
equity ownership, much of the money returned to individual households flows into passive investments
and non-productive ‘assets’ that are actually positional goods of one sort or another. The result is
something very much like Keynes’ liquidity trap. At the beginning of 2014, the world’s 1200 largest non-
financial firms collectively held about $3.5 trillion in cash or cash equivalents. Firms with more than $2
billion held 85 percent of this cash, and the top 10 percent of firms held a bit over 50 percent (see also

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8 See also Koo (2011) who has a balance sheet based version of the liquidity trap argument.
9 McKinsey authors Dobbs et al. (2015) analyzed all global firms with annual revenues over $200m, a bit more than
28,000 in total.
Pinkowitz, Stulz, and Williamson, 2012). Among these firms, US firms – the bulk of the top 10 percent – held 50 percent of all cash, and Apple alone accounted for 5 percent of global cash and thus 10 percent of US firms’ cash. As the next section shows, this pattern of inequality in corporate cash holdings is connected to differential control over intellectual property and/or access to rents, because these cash holdings are retained profits/rents. The combination of unequally distributed cash holdings and the passive investment of those holdings is the material manifestation of the liquidity trap.

**Inter-firm profit and wealth inequality**

Why do firms have such large cash hoards, and which firms? Why is monetary policy ineffective in motivating use of those hoards? This section examines the distribution of profits and cash holdings among global publicly listed firms single largest to show why Schumpeter’s rents pool in Keynes’ liquidity trap. Sanchez and Yurdagul (2013, 5) report that US corporate cash holdings were at historically high levels relative to the size of the economy in 2013, amounting to a full $5 trillion for all publicly held US firms (as opposed to just those within the global 1200) and $1.6 trillion for US non-financial firms (Figure 2). Moreover, the rate of cash accumulation accelerated from roughly 7 percent per year, 1980 to 1995, to 10 percent, 1995 to 2010. The rate of growth was even faster at the end of the second period. The net result is that the ratio of corporate cash holdings to GDP rose from about 6.5 percent to about 14.5 percent, 1990 to 2014.

Figure 2: US corporate cash holdings, 2006-2014
Source: Author’s construction from Moody’s data

This cash is distributed quite unequally. Of the roughly $1.8 trillion in domestic cash US firms held at the end of 2014, the top four firms accounted for 21 percent and the top 25 firms (i.e. the corporate 1 percent) accounted for almost 50 percent. This inequality necessarily reflects differences

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in the underlying profitability of firms, because cash holdings necessarily arise from profits. The inequality in cash holdings suggests inequality in the distribution of profits across firms. Furman and Orszag (2015, 9-10), using a different dataset than Sanchez and Yurdagul (2013) report that the variance in non-financial corporate return to investment has increased significantly over the past 30 years, suggesting rising inequality in profitability.

This inequality can be seen by constructing Gini indices for the 2000 publicly listed firms in the Forbes Global 2000 (FG2k), and for the 5267 publicly listed non-financial firms in the Osiris database that had operating revenues exceeding $1 billion in 2014. The annual Gini index for profits among the FG2k firms over the 2006 to 2015 period averaged 0.649; the Gini for total profits by all US firms in the FG2k 2006 to 2015 was higher at 0.744. The Gini for sales and assets was 0.59 each. Stripping out financial firms and utilities, the FG2k Ginis remain largely the same (and it’s misleading to strip out financials anyway). Gini indices for profits by the non-financial firms in the Osiris dataset show a similar pattern. To eliminate noise, I aggregated profits into five year periods starting with 1990 and ending in 2014. The average gini over this much larger set is unsurprisingly higher than for the FG2k, at 0.792, because it includes a much longer tail of low or no profit firms, even after truncating firms with losses. Truncating the Osiris data at 2000 firms over the same period as the FG2k generates a similar gini at 0.639, even though the Osiris set excludes financial firms. This pattern of inequality holds across sectors in the Osiris data.

This high level of inequality in firms’ profitability translates into inequality in their ‘wealth’ – i.e. market capitalization – and consequent to that inequality in the wealth and income of the people employed by those firms. The average Gini for market capitalization among the FG2k firms was 0.607. These Ginis are considerably higher than the corresponding Gini indices for individual or household inequality in a wide range of countries (Table 1).

The unequal distribution of global profits is replicated inside national economies. Table 2 compares the eight largest sectors inside the USA, Germany and Japan in terms of their share of total profits, and thus firms’ ability to accumulate corporate wealth in the form of both retained earnings and market capitalization, for firms from those countries and in the FG2k list. This comparison is crude, given that firms inside the same nominal category do not necessarily have the same degree of IPR ‘heaviness,’ as the subsequent discussion of firms based on the Osiris data shows. And it is based on profits as a percentage of sales, a slightly unusual indicator, a choice I will justify farther down. But it still provides an interesting snapshot of sectoral dominance in the three largest market economies, and the degree to which profits are above average in those sectors. For example, both the centrality of automobile manufacturing in Germany, and its mediocre profitability (despite Porsche’s outlandish 2008 financial coup squeezing VW shares) are evident. Automobile firms in both Japan and Germany make returns that exceed both their US auto counterparts and their own national averages, but which nonetheless are lower than the economy wide average for the USA. Likewise, four of the eight

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12 Firms could increase their cash holdings by borrowing and then holding cash, but aside from this being economically irrational when it is above the level needed to finance on-going operations, the net debt to equity ratio for the non-financial US S&P 500 has fallen by two thirds over the past 20 years (Compustat).

13 For the Forbes Global 2000, see: http://www.forbes.com/global2000/. For Osiris, see: http://www.bvdinfo.com/en-gb/our-products/company-information/international-products/osiris. Not all firms in the Forbes Global 2000 have positive profits. Given that the Gini index does not work well with negative numbers, I opted to simply truncate the data series for each year of the Global 2000 at the Nth firm before firms had negative profits. Alternately, I could have simply bottom coded all firms making losses as ’0’. This latter technique is the one that the Luxembourg Income Study uses when dealing with negative household incomes. However, the former technique lowers the final Gini coefficient and thus provides a more conservative estimate of inequality among firms. Thanks to Lindsay Flynn and Annie Rorem for discussions about this issue.
largest sectors by profit volume in the USA arguably are constituted by IPR firms (italicized in Table 2). But aside from Japanese pharmaceutical firms – whose prices are tightly regulated by the Japanese state and who are notoriously bad at innovation – the IPR sectors everywhere all have ratios of profit to sales well above their national averages.

Table 1: Corporate profit inequality (Gini) versus household income inequality (Gini), select years

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<td>.649</td>
<td>.639</td>
<td>.792</td>
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Select countries, household income inequality 2013

<table>
<thead>
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<th>Country</th>
<th>Gini</th>
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<tr>
<td>South Africa</td>
<td>.650</td>
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<tr>
<td>Brazil</td>
<td>.532</td>
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<td>US</td>
<td>.411</td>
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<td>UK</td>
<td>.380</td>
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<td>Germany</td>
<td>.306</td>
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<td>Denmark</td>
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<td>Norway</td>
<td>.268</td>
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<td>Sweden</td>
<td>.240</td>
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Author’s calculations from Forbes Global 2000 data, Osiris database, and OECD-iLibrary.org

Table 2: Eight largest sectors in the Forbes Global 2000 by share of profits, Germany, Japan, and the USA, plus cumulative profit as a % of cumulative sales by sector, 2005 to 2014

<table>
<thead>
<tr>
<th>USA</th>
<th>Share of total profits for US FG2k firms</th>
<th>Profit as % of sales</th>
<th>Japan</th>
<th>Share of total profits for Japanese FG2k firms</th>
<th>Profit as % of sales</th>
<th>Germany</th>
<th>Share of total profits for German FG2k firms</th>
<th>Profit as % of sales</th>
</tr>
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<tbody>
<tr>
<td>Oil &amp; Gas Operations</td>
<td>12.46%</td>
<td>8.0%</td>
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<td></td>
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<td></td>
<td>Auto &amp; Truck Manufacturers Insurance - Diversified Chemicals</td>
<td>25.72%</td>
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<tr>
<td>Banks - Major</td>
<td>7.74%</td>
<td>5.1%</td>
<td></td>
<td>Banks - Major</td>
<td>13.93%</td>
<td>3.4%</td>
<td></td>
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<tr>
<td>Pharmaceuticals</td>
<td>4.93%</td>
<td>8.9%</td>
<td></td>
<td>Trading Companies</td>
<td>8.85%</td>
<td>3.4%</td>
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<tr>
<td>Conglomerates</td>
<td>4.28%</td>
<td>8.2%</td>
<td></td>
<td>Telecommunication Services</td>
<td>7.20%</td>
<td>5.4%</td>
<td>Utilities - Electric</td>
<td>11.30%</td>
</tr>
<tr>
<td>Software &amp; Programming</td>
<td>3.69%</td>
<td>21.4%</td>
<td></td>
<td>Pharmaceuticals</td>
<td>4.00%</td>
<td>5.3%</td>
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<tr>
<td>Computer Hardware</td>
<td>3.36%</td>
<td>10.4%</td>
<td></td>
<td>Auto &amp; Truck Parts</td>
<td>3.85%</td>
<td>3.3%</td>
<td>Banks - Major</td>
<td>6.04%</td>
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<tr>
<td>Utilities - Electric</td>
<td>3.25%</td>
<td>6.5%</td>
<td></td>
<td>Transportation - Rail</td>
<td>3.60%</td>
<td>4.3%</td>
<td></td>
<td></td>
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<tr>
<td>Computer Services</td>
<td>3.15%</td>
<td>15.3%</td>
<td></td>
<td>Iron &amp; Steel</td>
<td>3.59%</td>
<td>4.4%</td>
<td>Pharmaceuticals</td>
<td>2.64%</td>
</tr>
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These sectors as % of total economy Average for economy

| USA         | 42.9%                                | 59.3%                | 80.1% |

Author’s calculation from Forbes Global 2000 data for indicated years.
The distribution of US corporate cash holdings suggests that IPRs explain these differences in profitability. This distribution is both unequal and favors firms controlling significant IPRs. Table 3 displays the ten largest firms in terms of overseas cash holdings. These firms collectively hold about one-third of the total cash held by the 2000 largest US firms. The predominance of tech and pharmaceutical firms in this list is obvious. Indeed, as Table 2 might suggest, only two US oil firms and two banks break the top 20. Similarly, the two largest automobile firms in the world, VW and Toyota, collectively employing about 930,000 people and generating nearly $0.5 trillion in annual revenue, together held only about $60 billion in 2014, about the same as Google with 60,000 employees and $66 billion in revenue.

Table 3: Top 10 US firms by cash holdings at December 2014
‘Tech’ in bold; Pharmaceuticals in italics

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<thead>
<tr>
<th>Company</th>
<th>$ Billions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple</td>
<td>$178.0</td>
</tr>
<tr>
<td>Microsoft</td>
<td>$90.2</td>
</tr>
<tr>
<td>Google</td>
<td>$64.4</td>
</tr>
<tr>
<td>Pfizer</td>
<td>$53.6</td>
</tr>
<tr>
<td>Cisco Systems</td>
<td>$53.0</td>
</tr>
<tr>
<td>Oracle</td>
<td>$44.7</td>
</tr>
<tr>
<td>Johnson &amp; Johnson</td>
<td>$33.1</td>
</tr>
<tr>
<td>QUALCOMM</td>
<td>$31.6</td>
</tr>
<tr>
<td>Medtronic</td>
<td>$31.1</td>
</tr>
<tr>
<td>Merck &amp; Co.</td>
<td>$29.2</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$608.9</strong></td>
</tr>
<tr>
<td>Total as a percent of $1.78T holdings by 2000 firms</td>
<td>33.8%</td>
</tr>
</tbody>
</table>

Source: Bloomberg

We would expect large sectors, like autos in Germany or Japan, to capture a large share of profit simply because they account for a large share of economic activity. The question is whether those profits are disproportionate to the size of the sector. This is the first reason why I use net profit as a share of operating revenues as an indicator. Although there is no reason to expect profit as a percentage of sales to equalize over time, profit relative to operating revenue is a reasonable indicator of the degree to which a firm captures value from the value chain of which it is part. This is a reasonable indication of the degree to which monopoly power is successfully exercised.

To operationalize this, I selected the 300 largest firms in the Osiris dataset by cumulative net profit over four 5 year periods starting in 1995. These firms account for roughly 60% of the net profit of the 5000 plus firms in the dataset for any given period. Since we are concerned with the delta in investment and government revenues, these firms matter as they are both big and control the bulk of profits. At the same time, the choice of a global rather than US dataset is a conservative option, given the predominance of US firms in IPR sectors. I aggregated the net profit and operating revenues for
these firms by NACE sector\textsuperscript{14} in five year periods beginning in 1990. Aggregating data to the sector level is also a conservative choice. I then calculated the average ratio of tangible fixed assets to intangible fixed assets for the same periods for a given sector. Table 4 presents the results of a simple correlation of the share of net profit in operating revenues against the ratio of intangible fixed assets to tangible fixed assets. Despite the enormous positive ‘China’ shock to profits for oil and materials based firms in the 2000s, it shows a steadily increasing correlation from 1995 to 2014. Though none of these rise to the level of statistical significance, the last period is close at $P=.106$. Figure 3 presents the data for the 20 largest sectors visually, with the size of the bubble proportional to the sector share of total profit. The three outliers to the northwest are real estate, pipelines and coal mining. The latter two benefited from China’s outsized demands for energy. Stripping them out would make the correlation statistically significant at $P=0.05$.

Table 4: Correlation of ratio of net profit to operating revenues with share of intangibles in fixed capital, 1995-2014

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<tbody>
<tr>
<td></td>
<td>All 20 sectors</td>
<td>Excluding outliers</td>
<td>All 20 sectors</td>
<td>Excluding outliers</td>
</tr>
<tr>
<td>correlation</td>
<td>0.1436</td>
<td>0.3544</td>
<td>0.1519</td>
<td>0.2224</td>
</tr>
<tr>
<td>p-value</td>
<td>0.5457</td>
<td>0.1365</td>
<td>0.5227</td>
<td>0.0136</td>
</tr>
<tr>
<td>n</td>
<td>20</td>
<td>19</td>
<td>20</td>
<td>19</td>
</tr>
</tbody>
</table>

Source: Author’s calculation from Osiris data

\textsuperscript{14} NACE (\textit{Nomenclature statistique des Activités économiques dans la Communauté Européenne}) is the standard industrial classification scheme for the European Union. See http://ec.europa.eu/eurostat/documents/3859598/5902521/KS-RA-07-015-EN.PDF
The second reason to use the ratio of net profit to operating revenue as an indicator of market power relates to changes in industrial organization that affect the distribution of income to individuals. IPR firms’ have a disproportionately large share of profits relative to operating revenue or sales and have disproportionately large cash holdings. An unequal distribution of profit among firms is nothing new, as the Osiris data show. The gini for corporate profits was as skewed in the 1990s as it is today. And the giant mass production firms that dominated the economy of the 1950s and 1960s probably captured outsized profits via oligopolistic competition. Yet the economy had strong growth, a relatively equal distribution of income, and smaller pools of retained earnings as compared with today because the form of industrial organization redistributed those profits not only widely within the firm but across firms with much larger headcounts than today.

To understand what changed we have to look at how IPR firms generate profit, and how the predominant form of industrial organization has changed over the past four decades. Put simply, the nature of IPRs as monopolies allows the profits these monopolies generate accrue in firms with a lower propensity to invest, allows those firms to shrink their labor footprint to the smallest possible size, and allows them to shift profits to low tax venues with greater ease than was true for the industrial behemoths of the 1960s. The next sections discuss the sources of monopoly power and changes in industrial organization.

**IPRs, monopoly profits, and industrial organization**

Mid-20th century firms’ profitability depended on their control over physical capital and the efficient management of that physical capital. The biggest and most profitable firms were those controlling large fixed investments (Piore and Sabel 1984). These firms did most of their production in-house, and their employee base incorporated a huge range of ancillary services supporting production (Lazonick 2009). Think: the old GE or GM. GM’s employee headcount in 1960 was roughly 600,000, and it did *inter alia* its own accounting, cleaning and catering. It produced 70 percent of its value in-house, and designed and built most of its machinery. The nearest equivalent today would be Samsung, a diversified industrial giant, which draws some inputs from its *chaebol* family members while exploiting Korean small and medium sized enterprises. In the 1960s, tangible assets like plant and equipment constituted 80 percent of the stock market capitalization of the S&P 500 (OceanTomo). Stock market capitalization is the equivalent of a firm’s wealth and a reasonable approximation of its power (Weber 1978, 93, 108, 638; Nitzan 1998).

Today, firms’ profitability largely depends on their control over intangible assets, which largely means IPRs like patents, copyright and trademark. The biggest firms in terms of market capitalization and profitability are those controlling the most valuable patent and IPR portfolios. In a significant change in industrial organization, these firms largely subcontract out everything that is not related to the direct production of their IPRs, shrinking their employee base to the absolute minimum. This subcontracting includes the physical production of goods. Think: Apple. Apple’s employee headcount is about 90,000, but 60,000 of these are contract workers in its retail stores. Apple subcontracts virtually all of its physical production to firms like Foxconn (Hon Hai Precision) that employ cheap Chinese labor. Apple makes nothing physical itself, aside from a few highly specialized servers. By 2005, intangible assets constituted 80 percent of the market capitalization of the S&P500.

Inequality among firms arises from the fact IPRs give their owner a legal monopoly. The density of IPRs create high levels of monopoly across the economy today. Samuelson (1954), Ostrom (2010) and Buchanan (1965) defined goods using the two binary characteristics of excludability (essentially, can I legally prevent someone from consuming a good?) and rivalry/extractability in consumption (does my consumption of a good subtract from what you can consume of that good?). This defines four types of goods: private goods, public goods, common pool goods, and club/franchise goods.
The economics profession uses social clubs as their example for club goods, and thus sees no barriers to their production. Consumption is non-rivalrous, in that your enjoyment of our shared social activity does not limit my enjoyment (and indeed might enhance it). Production of those social activities has costs, like any production process, but the requirements for club membership – and the imposition of an entry or membership fee – assures that those costs are borne by those who enjoy the good, unlike the situation with public or common pool goods. So far, so good. Yet the choice of the label club good and the associated example is somewhat misleading and ideologically charged because it conjures up voluntary association. The choice of ‘clubs’ distracts attention away from the issue of what exactly creates the excludability that distinguishes a club good from a public good, and the macro-economic effects of that excludability.

In Ostrom’s (2010) terms, information wants to be a public good, i.e. one that is non-rival (non-subtractable) in consumption and non-excludable, and thus ‘free’ (but see Doctorow 2014). In the extreme case, a digital copy of a piece of music using a standard coding format can be distributed to anyone with a device that can play that codec. Production costs for digitized music are essentially the studio rental fee. Studios are so cheap to rent that even political science professors have been known to cut their own albums.\(^\text{15}\) Given very low costs of production for the first digital version, the average cost of production is minimal and the marginal cost of reproduction is virtually zero (some electricity is consumed downloading and playing the file). Digitized music is close to being a public good – non-excludable, non-subtractable. How can actors producing music be profitable in this environment? Profits can only arise if the state creates and enforces excludability via IPRs.

Precisely because no one voluntarily produces public goods, states in general and in particular the US state make public goods profitable by creating the possibility of exclusion. This is why I prefer the term ‘franchise good’ to club good. A franchise traditionally was a royal privilege, generally a grant to exploit something. The central defining feature of a franchise good is that the state creates and enforces both the quantity and quality of excludability. Thus the music industry has directed major lobbying efforts towards creating, enforcing and extending the Digital Millennium Copyright Act (1998) as well as doubling the copyright period through the Copyright Extension Act. The DMCA makes it illegal to thwart copyright protection methods using software or hardware. The Recording Industry of America Association (RIAA) spent roughly $90 million lobbying over the decade of the 2000s, and an additional $50 million in litigation against alleged pirates.\(^\text{16}\) All this lobbying was directed at steadily expanding the scope and effectiveness of restraints on copying of digitized information, and thus making it possible to monetize digitized music. The ‘quality’ of these property rights (e.g. their duration, exceptions, or mandates for licensing) matters as much as the ‘quantity’ (i.e. the sheer fact of a patent or copyright). Politically defined IPRs determine a significant part of the profitability of a franchise good and thus the equity market capitalization of the firms producing franchise goods.

In the worlds of legal and economic theory, IPRs are not a problem. Theoretically, these monopolies expire and are subject to competition through innovation.\(^\text{17}\) Practically, though, the link between stock market capitalization and cash flow built on existing monopolies prevents this. Firms’ market capitalization is based on current and expected cash flow. Firms with monopolies have a large expected cash flow and thus a large market capitalization relative to their asset base. This market capitalization allows them to preempt competition by using their monopoly profits and stock to buy up


\(^{16}\) Data from the Center for Responsive Politics, http://www.opensecrets.org.

\(^{17}\) Economists traditionally argue that these monopolies are necessary to incentivize innovation. However, see Boldrin and Levine (2008), Boyle (2008), and Baker (2004) for arguments about the weak links between patenting and invention / innovation.
potential competitors. Consider the iconic information economy firm Google. Google has bought Motorola Mobility (cell phones), Nest (in-home data collection), Waze (mapping and traffic info), AdMob (cell phone advertising), YouTube (ad delivery channel), etc. As a strategic matter, each of these purchases protects part of Google’s franchise (indeed the business press often uses exactly this language to explain the whys and wherefores of these acquisitions). This is why 85 percent of US firms with a return on capital over 25 percent in 2003 were still enjoying that level of return in 2013 (Furman and Orszag 2015, 11), and why, as noted above IPR intensive firms held the bulk of corporate cash in 2014.

The IPR phenomenon is not limited to nominally ‘high tech’ firms, and in any case, some firms that produce ‘high tech’ goods, like Flextronics, do so with low margins. Rather, the distinguishing features here are the adoption of a profit model in which state granted monopolies generate corresponding monopoly rents, and of an industrial organization model that shrinks the employee headcount. This model extends all the way from iconic tech firms like Apple over to decidedly low-tech but not old-fashioned firms, like McDonald’s, which control brands. In between are hotel brands, branded beverage producers, pharmaceuticals, suppliers of branded business services, producers of branded consumer goods, finance, and firms controlling various regulated reticulation networks.

Monopoly rents/profits accruing to IPRs wouldn’t matter if the industrial structure in turn distributed those profits to a broad base of workers, or ploughed them back as investment, or saw them captured as tax revenue. To return to the beginning of the article, these profits would then expand some component of C + G + I, leading to growth. The intangibility of IPRs allows firms’ to rationally reduce the flow of profit back into consumption, investment, and taxes. Put simply, the fact that IPRs are intangible allows firms to shift the legal ownership of profit into global tax havens in an exaggerated version of the transfer pricing that multinational firms used to use as a tax avoidance strategy. On the industrial organization side, the fact that IPRs can be used to capture monopoly profits from a value chain, and the intangibility of IPRs, allows firms to push physical capital assets and non-core labor outside the legal boundaries of the firm. As with tax avoidance strategies, this strategy maximizes the return on (now reduced) assets, garnering rewards from financial markets focused on shareholder value. Finally, IPR firms do not need to invest much to expand production, as production is contracted out. This produces a situation in which IPR firms retain profits without investing them, while firms that could be doing investment with high multiplier effects both lack the profits to make that investment and correctly fear over-capacity in an era of slow growth. Each of these effects in turn.

**Tax avoidance strategies**

The connection between IPRs and tax avoidance – and thence weaker government revenue and spending – is the simplest to limn. Unlike factories, intellectual property rights can be housed anywhere without affecting the final cost of production. The corporate entity that owns these IPRs can be controlled by a parent seeking to avoid taxation. Apple and Coca-Cola provide the best examples of tax avoidance (for general arguments, see Palan, Murphy, and Chavagneux, 2013, and Gravelle, 2015). Apple is essentially only a producer of IP. It produces only a handful of highly specialized servers internally. Its product is fully intangible: the iOS and the physical design of its products. The intangibility of both of these allows Apple to shift legal ownership of the rights to 40 percent of the revenues generated by that IP to a shell corporation, Apple Sales International. Apple Sales International had no employees until 2013, and is located in Ireland. Apple Sales International is technically the entity that contracts with, e.g., Hon Hai for the production of Apple products, and licenses Apple’s various operating systems to Hon Hai for installation on those products. Those products are physically produced in China, and shipped directly to Apple distributors world-wide. Apple International literally does nothing beyond appending its name to various contracts. But it collects massive amounts of revenue from every transaction. Apple Sales International attracts no legal tax liability because it is not considered to be domiciled in either the US or Ireland for tax purposes (Levin 2013).
Coca-Cola operates a similar tax avoidance strategy. The formula for Coca-Cola is held by an Irish shell company controlled by Coca-Cola. It is then licensed back to Coke US, which produces the physical, flavored syrup that is shipped to franchised bottlers in the US. These franchisees have slightly more control over their operations than franchised fast food chains in that they can vary how they use their machinery. But the net result is much the same: The IPR-based profit component of the value chain is segregated legally into a stand alone firm (and within that firm to a stand alone daughter firm in a tax haven) in order to maximize shareholder value and return on assets for that firm. Coca-Cola actually tried to bring production in-house in the 2000s, only to return to its franchising strategy by the end of the decade. This kind of tax evasion / avoidance could not be done as easily if firms were physically producing goods in facilities that were integrated with IP production. Most tax authorities use a substantial presence test that would attach taxation to the value created in that factory. Non-IPR multinational firms can and do use transfer pricing to shift revenue into more tax-friendly jurisdictions. But the need for physical proximity to markets or for skilled labor limits the degree of freedom they have in locating production in tax-friendly jurisdictions.

These tax avoidance strategies limit the state’s ability to use the welfare state to ameliorate income disparities or to increase government spending to revive the economy. The ratio of after tax profit to before tax profit in the US was roughly 66 percent in the 1980 to 2000 period, but rose by ten percentage points to roughly 76 percent in the 2001 to 2014 period (FRED). This represents a shift of 3.3 percent of GDP from tax revenues to corporate profits, which is roughly the steady state Federal budget deficit, and considerably larger than the cost of all Federal welfare programs net of Social Security, Medicare and Medicaid. To the extent that these tax avoidance strategies work best for IPR rich firms, they also produce some of the inequality of corporate profits and cash holdings noted above. The implied tax liability on the $2.1 trillion of un-repatriated profits held offshore by the 500 largest US firms as of early 2015 equates to an estimated $620 billion tax liability (Citizens for Tax Justice, 2015). In effect, a second 2010-2011 Obama economic stimulus package worth of untapped revenue sits idle, reducing ΔG. These holdings are of course the product of years of accumulation. But the annual amounts are non-trivial, with the Congressional Joint Committee on Taxation estimating revenue loss at $85 billion for 2014, which is also the rough midpoint of Zucman’s (2013) estimated range of $55 billion to $133 billion for 2013 (Gravelle 2015, 20-21).

**Industrial organization and income inequality**

As with tax avoidance, firms possessing IPRs have also benefited from a change in industrial organization driven by the spread of the shareholder value model since the 1980s. As Chandler (1990) noted, strategy determines (industrial) structure. The shareholder value strategy emphasizes reducing the footprint of labor and physical assets inside a company (Lazonick 2009). Put simply, if what matters to financial markets is return on assets, then dividing a large numerator (monopoly profits) over a small denominator (the costs of labor and physical assets) produces the biggest financial market bang for the buck. Not coincidentally, this also allows management to reward itself lavishly as a firm’s market capitalization rises. Financial markets thus press firms to contract out physical-asset heavy production and contract in or out labor-intensive services when those things do not represent a core activity for the firm. Both processes concentrate income. Sociologists have long noted that firms tend to harmonize wages inside the firm, a finding confirmed by a recent study of the tax returns of 6 percent of all US employees (Bloom et al., 2015). Janitors directly employed by highly profitable firms are better paid than janitors working for low profit firms contracted by higher profit ones. Concentrated profits and wealth among firms leads to concentrated income among people, as firms pay out their earnings to their relatively small pool of employees and shareholders. By contrast, firms with large fixed physical asset bases are vulnerable to cyclic downturns, concentrating losses on their owners and workers. Skills based
technical change, an effect complementary to the one described here, accounts for at most one-quarter of rising income inequality (Michaels, Natraj and van Reenen, 2014).

As David Weil (2014; see also Autor 2003; 2014) has argued, over the past two decades firms have limited their legal liabilities by shifting non-core labor outside the firm and then contracting that labor back in. Contracted labor includes not only unskilled labor intensive tasks like janitorial services, but also what might otherwise appear to be core tasks like semi-skilled assembly line labor. Thus even core automobile assemblers now have substantial numbers of temporary workers on their assembly lines. Weil (2014) shows that the share of workers in some form of contingent or sub-contracted employment ranges from one-sixth of the US workforce on a narrow definition, to as much as one-third if employees at fast food and other franchises are included.

Rather than internalizing an occupationally diverse workforce inside the legal boundaries of the firm, US firms now tend to externalize non-core activities as well as direct production. Functionally, this takes the form of sending labor-intensive, loosely-coupled work to low wage zones inside the US and, perhaps more commonly, developing Asia. Legally this takes the form of pushing workers out of the firm and then bringing them back in as employees of different firms providing some service to the core firm. It can even take the form of hiring in direct production workers from labor contractors. This out-sourcing (and off-shoring) creates firms with more internally homogeneous work forces while at the same time creating more inter-firm heterogeneity. It also concentrates revenues on the relatively small number of direct employees remaining. A wide range of firms have adopted this strategy, but it is most easily accomplished by IPR heavy firms.

By contrast, the prevailing form of industrial organization 50 years ago tended to equalize wages. GM and other firms largely designed their own product in-house, operated factories to build components and final products, and hired their own cleaners, security, etc. Indeed, GM reputedly produced 70% of its value internally. They of course patented (trademarked, etc.) their intellectual property. But their more limited rents from IPR were distributed to the entire workforce because either unions’ or firm’s desires for internal labor peace tended to compress wages (Swenson 1989). Moreover, unions tended to equalize wages across an entire sector (as in France, Germany, and the United States) or the entire economy (as in Sweden and Australia). The result was slightly underpaid skilled workers, significantly overpaid unskilled workers (because they had access to health and pension benefits), less variance across firms, and thus less income inequality overall. The closest firms to this older model today would be Samsung or Intel, which still retain substantial manufacturing capacity in-house and have high labor headcounts. This internal cross subsidization limited income inequality.

Today, labor-light strategies now extend into the heart of the old physical economy. Led by Toyota and Honda, who in their formative years only produced 20 percent and 30 percent of the value of a car in-house respectively, and who made generous use of contract labor, Japanese car makers in the US (and Japan) increasingly staff their assembly lines with contract workers. Contract workers account for about half the line workers at Subaru’s Japanese factories. They account for about 30 percent of labor in Toyota’s Canadian factories and 20 percent in its US factories. Nissan’s Smyrna, TN factory may have as many as 60 percent of line positions filled by ‘perma-temps.’ The US auto manufacturers negotiated a similar two-tier workforce with the UAW during the 2008-2010 crisis, though this arrangement is now unraveling.

At the other end of the spectrum, the high tech world is full of firms that simply do design, and then contract out actual physical production to tangible-asset heavy manufacturers, and the low tech world of firms controlling brands similarly works on brand management without doing the actual

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production of services. Apple, as noted above, produces virtually no physical objects. But firms like ARM (cell phone processor chips), Qualcomm (cellphone switching software and chip design), or Nvidia (graphics processors) operate on similar lines, relying on specialist, physical capital-intensive silicon foundries to build their chips. These foundries represent major capital investments, with semiconductor fabs typically costing between $1 and $5 billion; Samsung’s largest fab cost $10 billion. Finally, the labor-intensive assembly steps are done by specialist assemblers, like Hon Hai Precision (Foxconn), Flextronics, or Pegatron using low-wage labor in Asia or Eastern Europe.

This tripartite industrial architecture—high profit human capital-intensive design firms controlling IPRs, moderately profitable but cyclically vulnerable physical capital-intensive production firms, and low profit labor-intensive assembly or service delivery firms—is replicated over the entire IPR sector, regardless of the level of technology involved. Thus, in the low-tech hotel and hospitality sector, the typical format is a firm that controls the brand name(s), a variety of Real Estate Investment Trusts (REITs) or real estate firms that owned the actual buildings, and disposable labor contractors who supply cleaning and front desk staff. For example, the British hotel giant InterContinental owns only eight physical properties, but licenses its brand to (sometimes quite large) firms operating the rest of the almost 5000 hotels bearing its name. Hilton Hotels similarly only owns about 4% of the roughly 4100 properties operating under its collection of brand names. Firms like LaborReady and Adecco’s Hospitality Staffing Solutions provide labor to hotel operators on demand. AirBNB carries this to an extreme, owning no physical assets at all. In the retail sector, Weil (2014) reports that WalMart’s warehouses—something you might imagine to be a core operation for a gigantic retail firm—are actually operated and supplied by the specialist logistics firm Schneider, which then contracts in labor from manpower firms like Premier Warehousing Ventures.

Finally, franchising in its most narrow usage also has this structure. In a typical fast food franchise, the franchisor will supply machinery (built by a different physical asset heavy firm), menus, branding, and detailed instructions on food preparation and presentation. Many also supply some start up capital for franchisees in the form of loans. (McDonald’s also typically buys the real estate on which the franchisee’s restaurant sits and then rents that to the franchisee.) Franchisors also typically dictate prices to franchisees. The franchisor thus controls virtually all aspects of the operation of the restaurant, and generates profit from everything that goes into the restaurant. The only cost the franchisee typically controls is staffing and wages. The income dynamics here are easy to understand. Franchisees have every incentive to depress wages and hyper-exploit their workers in order to maximize their own profit, while franchisors are able to extract maximum revenue from their tied franchisee clients. Franchisors control property, the brand, with legal protection, while the other firms are exposed to competitive pressures, and, in the case of labor contractors, are essentially interchangeable.

A number of studies have shown that rising wage inequality stems from differences in firms’ productivity and profitability. Put simply, the richer firms controlling IPRs pay their (core) workers better, and their management extravagantly, as compared to firms with a tangible asset profile (Barth, et al., 2014). Bloom et al., (2015, 3), using a random sample of six percent of all IRS form W2 data and covering 100 percent of US firms, report that “virtually all of the rise in earnings dispersion [in the US from 1978 to 2012] between workers is accounted for by increasing dispersion in average wages paid by the employers of these individuals.” Bloom et al.’s better paying firms were the ones with higher productivity and thus higher profits. Their sample set allowed them to avoid top-coding, imputation, and measurement error because it drew on actual wage payments made by employers. Lawrence Mishel (2015) has criticized some of the Bloom et al., findings that there has been no increasing dispersion of

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19 For non-Americans: IRS Form W2 is the employer’s report of wages and benefits paid to a specific individual in a given tax year. This information is transmitted to both the individual (so she can accurately prepare a tax filing) and the tax authorities (so they can prevent misreporting and underreporting).
wages between top employees and average employees in general, but does not dispute the finding of inter-firm dispersion, which is mostly what concerns us. Bloom et al. (2015) calculate that individuals in the top one percent of income earners typically worked in firms paying about double the average wage. Furman and Orszag (2015, 3) similarly calculate that about two-thirds of the increase in the income share of the top one percent by income in the United States is attributable to increased wages. The dispersion of earnings between firms is consistent with the argument about industrial organization above.

Table 5 illuminates this three-tier industrial structure structure via comparisons of employee head count, profits, and profit per employee for some of the firms involved in production of the iPhone, using average revenues, profits and employee headcounts for the 2010-2014 period to even out some of the effects of the recession. The firms chosen represent the two producers of the most expensive physical components, the major assemblers, and the largest suppliers of intellectual property. Out of the typical $630 sale price of an iPhone6, Apple collects $367 in gross revenue (and $319 in net revenue), Samsung collects $65 for the processor and memory, Toshiba collects $37 for the display, Qualcomm collects $15 for the WLAN and cellular software, and Foxconn collects $15 for assembly according to the technology research firm iSuppli (see also Kraemer, Linden, and Dedrick, 2011). Qualcomm’s outsized returns in Table 5, line 3 reflect royalties on the core software connecting handsets to the cellular network; Qualcomm collects money on virtually every handset sold globally, not just Apple products.

Table 5: Representative firms involved in production of Apple iPhones, 2010-2014
Source: Author’s construction from Osiris data

It could be argued that the end of internal cross-subsidization present in this new three tier structure simply reflects a deeper and more efficient division of labor enabled by new information technologies that allow for better monitoring of performance across firm boundaries. But this argument actually supports the points above. If this deeper division of labor is more efficient, why has growth faltered rather than revived as four decades of change in industrial organization removed damaging internal cross-subsidies? Moreover, our main point is precisely that the removal of internal cross-
subsidies concentrates income into lower-head count firms that capture monopoly rents. Finally, better monitoring of performance and in particular labor performance across firm boundaries suggests that brand owners and franchisors are de facto the employer of those workers. It is their de jure distance obviates the need to share part of the rent with those workers. So arguments about a technologically enabled division of labor simply avert their eyes from the macro-economic consequences of that new forms of industrial organization, and the way in which that form of organization is rooted in legal rather than functional realities.

**Investment and IPRs**

Finally, this new three-tier industrial organization also inhibits net new investment two different ways. The human-capital intensive IPR-based firms that accumulate the most profits have the least incentive or need to investment them productively in order to expand production. The physical-capital intensive firms that need increased investment to expand production face macro- and micro-economic disincentives to invest.

Human capital-intensive firms based on IPRs have no incentive or need to recycle profits as significant new productive investments. They do need to recycle profit to develop new products and improve old ones, and indeed a major strategy for these firms is the creation of rapid emotional or functional obsolescence, as with Apple’s series of iPhones. But this requires relatively little spending as compared with firms making physical products. Expanding the output of software, screen-able media, or even many pharmaceuticals does not require massive investment in new plant. Most pharmaceutical plants run at about a third of capacity as compared to automobile factories (McKinsey, 2010), and producing an additional unit of a program, or MP3 file costs nothing. Developing new drugs does entail large fixed upfront costs, but the pharmaceutical industry spent more on mergers and acquisitions than on new drug development over the past 18 years, suggesting that profits are not being invested in new productive capacity. In either case, most of the cost of new investment for IPR firms is hiring additional workers. Even if this adds to employment the multiplier effects are weak. These workers are largely concentrated in a few locations and the additional wages flow into competition over positional goods and especially real estate.

The incentive to invest more is also weak. First, intangible assets don’t depreciate, so there is no reason to spend money replacing them. Second, by definition, a monopoly prevents competitive entry and thus weakens the pressure to invest in more productive capacity. IPR firms use their thicket of patent and copyright to deter entry (Bessen, Meurer, and Ford 2011). The Congressional Research Service reports that patents significantly raise the costs incurred by non-patent holders wishing to use the idea or invent around the patent by an estimated 40% for pharmaceuticals, 30% for major new chemical products, 25% for typical chemical goods and roughly 7% to 15% for electronics (Schacht 2006: 5-6). The rational business strategy is to milk the revenue stream from an IPR as long as possible, while making the occasional incremental investment to ward off potential competitors.

The clearest evidence that the major IPR based firms abjure new investment is the piles of cash noted above. If they needed to spend it, they would have.

By contrast, physical-capital intensive firms do need to replace depreciating equipment, and should need to expand plant in order to met rising demand. Why do they invest less than they might? First, these firms in general have always been historically reluctant to risk creating excess capacity. One reason for the robust investment growth of the post-war era was the reassuring stability of demand growth, which allowed for easy planning. In today’s slow growth environment, the normal productivity creep of 2 to 3 % is often sufficient to handle increased demand in the rich economies. Second, one of the major reasons for adopting new ITC technologies and automation is that doing so permits cheaper replacement of depreciating capital and faster turnover of new capital. From a profitability standpoint this helps lower the denominator in the return on assets equation. But it does not increase aggregate
demand to the degree that building older, dumber facilities did in the past. While faster utilization of capital implies more demand at some point in the future, individual firms both live in the present and cannot count on this demand.

The clearest evidence of the degree to which physical-capital intensive firms have more difficulty accumulating investment funds is to contrast two best-in-class firms. Toyota’s $35 billion cash reserve was built up over the four decades in which it was the benchmark for the automobile industry. Apple’s $178 billion cash reserve accumulated in less than a decade, a pace roughly 16 times faster.

The argument here is not that the three-tier industrial structure prevents all investment. The main point is that it reduces new net investment, and thus slows growth. Slower growth in turn inhibits net new investment, much as Keynes argued 80 years ago.

Policy Implications

A recent OECD (2015) study reports that the two point increase in the Gini index in the 19 rich OECD countries, 1985 to 2005, shaved 4.7 percentage points off cumulative growth, 1990 to 2010. That translates to $2 trillion in lost GDP per year in the OECD. This article has argued that part of this rising inequality and slower growth can be attributed to the combined effects of changes in corporate strategy and structure. A minority of firms with strong IPRs is able to extract large rents from the economy, and the shift to a three-tier industrial structure prevents the redistribution of those rents into the broader economy. The concentration of large profits into a small number of firms and hands increases income inequality. The lower marginal propensity of high income firms to invest and high income individuals to consume reduces growth in aggregate demand. This macro-economic focus helps us understand the limits on purely individual strategies of wealth accumulation, given that most US wealth anyway is largely composed of corporate debt and equities whose long term values are tied to US and global growth rates.

What policy responses are possible? The most obvious things are to use tax policy to redistribute income back to the bottom 80% so that post-market incomes are more equal; to modify patent protection so that pre-market incomes are not as unequal among firms and people; to change the relationship between lead firms and their subcontractors and franchisees so that lead firms bear some responsibility for labor conditions and wages in firms that are technically outside their legal boundaries but functionally inside given the degree of control that lead firms exercise; and to thoroughly squash tax havens so that income accruing to intangibles cannot be domiciled in some mysterious space free of taxation.

The central policy should aim to weaken monopoly power in the dynamic markets generating growth. Changes in tax policy and welfare spending aimed at individuals help remedy the post-market distribution of income. But to the extent that wealth inequality arises from industrial organization and IPRs then policy interventions also need to change the pre-market inequality of income among firms. For example, patent and copyright duration could be shortened and the hurdle for patent approval increased to reduce firms’ ability to use a thicket of patents to deter competitive entry by other firms. Federal government prizes could replace patents as an incentive towards discovery (cf. DARPA’s robotics challenges).

These policies work with the market to reduce corporate concentration of income, and by doing so should speed up growth, which has positive consequences for employment. Slowing or reversing the concentration of corporate income helps reduce individual income inequality in the short and long run. The Supreme Court has take one step towards this by imposing stricter criteria for issuing a patent in Alice Corp vs CLS Bank International. But it remains to be seen if the US Patent andTrademark Office carries through with this. Currently the USPTO is moving only hesitantly towards new processes and standards, while it awaits political signals from the administration or a clearer set of guidelines from the courts (Interview with USPTO).
With respect to the new three-tier industrial structure, labor law should make lead employers legally joint employers with their franchisees and labor subcontractors. As with patents, this has already started. In a recent decision (Browning-Ferris) the National Labor Relations Board ruled that two entities are joint employers “if they share or codetermine those matters governing the essential terms and conditions of employment” which includes “hiring, firing, discipline, supervision, and direction,” as well as “wages and hours,” “the number of workers to be supplied, controlling scheduling, seniority, and overtime, and assigning work and determining the manner and method of work performance.” The NLRB said that even if this coordination was not done “directly and immediately,” it was enough if control “affects the means or manner of employees’ work and terms of employment, either directly or through an intermediary.” This is still a fairly strict test, but again a first step towards reform. The US business community is already mobilizing to reverse this decision. As with the constitution of the Supreme Court, much rests on the outcome of the 2016 election, because a new president will have the opportunity to appoint successors to the wave of board members appointed by President Obama in 2013.

Secular stagnation and wealth inequality are not the outcome of blind technological or demographic forces over which we have no control. Wealth inequality starts with firms. Wealth inequality results from the current structure of property rights, which creates monopoly profits and larger market capitalization for a select group of firms. Those profits create a firm-level inequality in profits that in turn creates individual income inequality. This concentration produces secular stagnation, given the low marginal propensity of rich firms to invest and the lower marginal propensity of rich households to consume. The quantity and quality of IPRs are political outcomes, and thus can be changed. Doing so would benefit both the economy as an abstract entity, which would make economists happier, and people, which would make them happier.
Sources: