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CEO Pay & Factor Shares: Bargaining Effects in US Corporations 1970-2011

JEL Codes D30 & E25

Abstract

This paper investigates changes in the distribution of value added over the past 30 years within a sample of US corporations and their relationship with CEO pay. The share of company value added going to staff compensation drops substantially over the period, while at the same time the share of staff compensation going to CEOs rises. We propose a framework in which CEOs bargain on behalf of investors to increase the capital share in value added, and are rewarded for doing so. Using firm-level data on factor shares and CEO pay, we find that better paid CEOs work in firms where CEO pay increases while the labour share fall substantially. The same relationship does not hold for lesser-paid CEOs. This pattern may contribute to understanding the wider evolution of income shares in the US economy over the period.

1. Introduction

Recent research has documented the concentration of pre-tax income shares at the very top of the distribution over the course of the last 30 years in the United States. Indeed the share of income going to the top 1% doubled from 10% in 1980 to 20% in 2011 (Piketty & Saez, 2003). Moreover, this trend is driven by gains in the income share of the top 0.1%, from 3% to 9% over the period[1]. The pattern of concentration continues even for the top 0.01% incomes.

At the same time, the share of top incomes coming from wages stabilized (for the top 1%[2]) or fell (for the top 0.1%[3]) after half a century of consistent gains. These facts suggest two underlying causes are driving the evolution of the income distribution over the period. First, top wage earners must be taking up a larger share of the wage income distribution today than in 1980. Second, given that inequality in wealth is generally much greater than income inequality (Kopczuk & Saez, 2004), the capital share of overall income is also likely to have increased. Indeed, Piketty & Saez' series on the

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[1] Piketty & Saez(2003, updated)
[2] Wage income went from 60.5% of the top 1% earners' total income (excl. capital gains) in 1980 to 59.1% in 2011. Piketty & Saez (2003-updated), table A7(cont.)
[3] The wage income share of the top 0.1% fell from 49.1% to 45.6% of total income (excl. capital gains) from 1980 to 2011.

distribution of wage income confirms the former, with the top 1% share in wage income going from 6.4% in 1980 to 11% in 2011[4]. On the other hand, evidence linking gains in the capital share to top income shares less clear-cut.

In seeking to analyse the relative importance of these phenomena, there are two obvious places to start. Firstly, if the distribution of the labour share of value added has become more uneven at the very top, top earners' wages – such as those of CEOs – would be rising faster than average wages. Secondly, if capital income increased faster than wage income over the period, the proportions of value added in the economy going to capital and labour would reflect this. Should both phenomena be occurring concurrently, a theoretical framework linking the two would go some way towards understanding the causes behind increasing income inequality in the United States.

Indeed, several reasons that have been put forward to explain why labour income may have become more unequal struggle to explain a simultaneous increase in the return to capital. Theories attributing rising income inequality to skill-biased technical change are one example. Under standard skill-biased technical change models, it is argued that emerging technological developments are complementary with higher skilled labour, thereby increasing the demand for skills even as the supply of college-educated workers grew. Since the demand for unskilled workers is assumed not to have changed much, the subsequent pay divergence is postulated to explain growth in income inequality.

Should the technological developments be more capital intensive than existing industries, the skill-capital complementarity these models feature might explain an increasing capital share and concurrent rise in income inequality. Similarly if technical evolutions lead to monopolistic rents in new industries, the skill-biased technical change framework might be compatible with a rising capital share. Given the anecdotal evidence that new industries are less capital intensive than old ones, the latter story seems the more plausible of the two.

Note however, that monopolistic rents are a feature of imperfect competition – which the skill-biased technical change models tend to rule out. More importantly, advanced countries undergoing similar technical change have not experienced the level of income concentration that has occurred in the United States, such as continental Europe and Japan. This international evidence makes it hard to believe evolutions in the income distribution are driven by skill-biased capital change, making these model ill-suited to understanding the concurrent evolution of the labour share.

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[4] Piketty & Saez (2003, updated) fig. 9

Other models have sought to explain the evolution of the income distribution in different countries through changes in taxation. Indeed, a standard response to reductions in the top marginal tax rate would see top earners supply more labour and increase their pay accordingly. Another response to lower taxation could see a reduction in tax avoidance efforts. This channel would explain part of the rise in pre-tax income inequality as coming from top earners ceasing to hide as much of their income from tax authorities, given that the incentive to avoid tax decreases when tax rates are lower. Looking at figures from the World Top Income Database[5], we do certainly see that the surge in top income shares coincides remarkably with reductions in taxation. International evidence also supports the hypothesis that changes in taxation are at the root of changes in the income distribution, since those countries that reduced top marginal tax rates the most and from the highest starting point (Australia, Canada, UK, USA) have also experienced the largest increase in top income shares.

While both these channels can explain some of the evolution in the income distribution, estimates of the implied elasticities of income with respect to tax suggest that there must be other responses by top income earners to falls in taxation. Piketty, Saez and Stantcheva (2013) have suggested that one such response comes in the form of increased efforts in bargaining for pay, and estimate that this elasticity is higher than the elasticity for increased effort. Building on work by Bertrand and Mullainathan (2001), they also show that CEO pay for luck is substantially higher under low tax regimes than high tax regimes. Thus they postulate that CEOs have increased their bargaining efforts to increase their compensation in a way that does not reflect higher marginal productivity. In this imperfectly competitive scenario, higher paid CEOs tend to be more rewarded for the market's overall performance rather than for outperforming their rivals when taxes are lower. In other words, the proportion of CEO compensation that is unrelated to their firm's performance – and by proxy their own performance - increases when taxes are lower.

High earners capturing a larger part of profits is likely to contribute to labour income inequality increasing. Evolutions in the capital share of overall income are also likely to be related to increasing top income shares. The evidence suggests that top wage earners also have a role in shaping changes in the capital share. Indeed in their study, Piketty, Saez and Stantcheva find that CEO pay remains highly correlated to investor returns, despite pay for luck. Other studies (Gabaix & Landier, 2008) confirm the strong relationship between CEO compensation and market capitalization. Thus even lucky

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[5] Online at topincomes.parisschoolofeconomics.eu

CEO's interests are still very much aligned with those of investors, at least in the short run.

This is revealing for at least two reasons. Firstly, better aligning CEO pay to investors' absolute returns has not resolved the problem caused by the difficulty in observing CEOs' relative marginal productivity. CEOs are still paid for luck, leaving plenty of room for bargaining a wage above what they would receive under perfect competition. Secondly, the way CEOs are incentivised to increase investors' short-term absolute returns does not emphasise growth by gains in revenue relative to competitors – cutting absolute costs also highly rewarded. Looking more closely at the bargaining activities of high earners, it seems unlikely then that CEOs should focus all their efforts on gaining a greater share of value added at the expense of investors. They are also incentivised to gain a greater share of value added for investors at the expense of other staff.

This response would consequently see CEOs capturing a larger part of staff compensation, given their pay's alignment with investors' share in value added. This paper proposes that CEOs bargain with both investors and employees. With employees, CEOs bargain for a greater share of value added for investors, not just for a higher share in payroll. Doing so improves CEOs' bargaining position with investors, whose returns they seek a greater share of by increasing pay for luck. Bargaining on both fronts would allow CEOs to benefit from wage income concentration and capital share increases simultaneously.

Conceivably, CEO bargaining efforts with employees extend down the management chain, as lower ranked executives are also rewarded with pay rises for containing the compensation of staff they oversee. Should top executives have increased their bargaining efforts through all of these channels over the last thirty years, the mechanism might go some way towards explaining how rising inequality within labour incomes might be accompanied by rising inequality between labour and capital incomes.

But aren't factor shares stable over time, one of Kaldor's (1963) facts? It is a feature of many growth models, including Cobb-Douglas variants of the Solow model, that technological change is assumed to be factor-neutral. Endogenous growth models do not postulate otherwise either. Indeed, the "stylized fact" of factor-share stability has found empirical support in many studies. This paper revisits standard measures of factor-shares to see whether recent trends have moved away from the stability found in previous studies. Typical measures of factor shares, such as those produced by the Bureau of Economic Analysis or the Bureau of Labour Statistics use macro data at the level of national accounts. Recent studies using similar macro data have shown that the

labour share has been declining in many OECD countries (Karabarbounis and Neiman, 2013). But for the purpose of investigating the bargaining dynamics described above, firm-level data is more appropriate, especially firm-level data incorporating executive compensation.

This paper therefore presents a dataset combining major US firms' financial data obtained from the Compustat-CRSP *Annual Fundamentals* with CEO and executive pay data from Forbes and Execucomp. The dataset covers the period from 1970 to 2011. Factor shares are calculated and the relationship between firm performance, CEO pay and the value added share is analysed. We find that there has been a significant increase in the share of value added attributed to capital at the same time as executive pay has taken up an increasing share of overall payroll. Furthermore, regressing CEO pay on firm-level factor shares shows that CEOs compensation tends to increase more in firms where the capital share of value added has risen. This effect is also stronger in low tax environments relative to high tax environments, suggesting that bargaining may be playing a role – encouraged by the bigger pie available as described by Piketty, Saez & Stantcheva.

In the first section of this paper, the firm-level data set is presented. The second section compares the evolution of factor shares at firm level with those from the national accounts and suggests possible causes for the divergence. The third section investigates the relationship between executive compensation with average pay and variations in firm-level factor shares. The final section concludes.

2. Firm-level data

The Compustat-CRSP merged *Annual Fundamentals* database is a comprehensive set of company financials covering almost all publicly listed corporations in the United States over the period from 1960 to 2011, the latest complete year for which data is available. In 2010, there were 3,885 US-based corporations in the database with a total market capitalization of $15.9 trillion and 35.5 million employees. To put this last number in perspective, Bureau of Economic Analysis (BEA) data indicates that domestic and foreign private employment by US firms stood at 118.5 million workers in 2010. Furthermore, aggregate EBITDA[6] for 2010 was $2.2 trillion in the Compustat sample compared to $3.5 trillion dollars in corporate gross operating surplus by US firms and

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[6]Earnings before tax, interest, depreciation and amortization. This is the firm-level financial statistic that equates to national Gross Operating Surplus, as defined in the national accounts.

their foreign affiliates as defined by the BEA. For comparison, the US private sector as whole generated a $5.2 trillion domestic gross operating surplus in 2011.

Although these numbers are not directly comparable, since firm-level data include figures for consolidated foreign subsidiaries, they give an idea of the sheer size of the US corporate business sector and indicate that the Compustat database is almost exhaustive in its coverage of corporate America. For our purposes then, bearing in mind that corporate business domestic value added represented 56% of US GDP in 2011, studying the evolution of corporate factor shares and labour income distribution should give a reasonable representation of the underlying mechanisms shaping the overall picture. The table below shows a summary of how the Compustat aggregate data compare with domestic aggregate statistics from the BEA since 2000.

	Full Compustat Sample (Domestic & Foreign)		Domestic & Foreign estimates* from BEA data			
Year	EBITDA (2011 $M)	Employment (thousands)	Corporate gross operating surplus (2011 $M)	Private Employment (thousands)	Compustat EBITDA vs BEA GOS	Compustat employment vs BEA employment
2000	2,082,201	37,096	2,536,400	119,262	82%	31%
2001	1,873,796	36,011	2,422,582	118,994	77%	30%
2002	1,836,253	35,896	2,479,279	117,193	74%	31%
2003	1,991,436	35,747	2,619,050	116,759	76%	31%
2004	2,185,220	36,777	2,907,329	118,555	75%	31%
2005	2,356,179	37,215	3,171,375	121,044	74%	31%
2006	2,616,888	37,744	3,410,303	123,768	77%	30%
2007	2,589,745	37,344	3,322,563	125,439	78%	30%
2008	1,907,405	36,532	3,200,164	124,368	60%	29%
2009	1,772,614	34,596	3,118,574	119,115	57%	29%
2010	2,237,839	35,546	3,492,568	118,497	64%	30%
2011	2,403,305	36,394				

* Sum of BEA data for domestic corporate GOS and foreign affiliates majoritarily owned by US corporates. Non-bank foreign affiliates until 2008, all-industry thereafter.
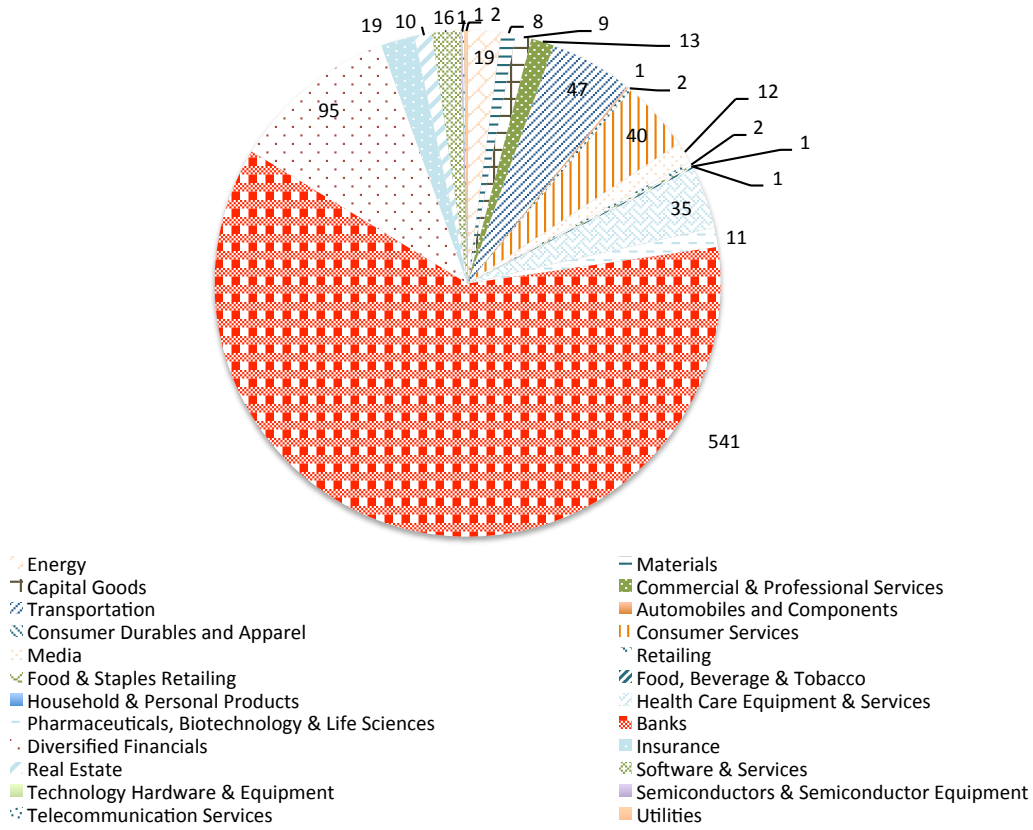
The Compustat data do have one major drawback however for the purposes of our study, namely that the universe of firms reporting the staff compensation figures required to compute factor shares is a relatively small subset of the overall database. Indeed, only 784 of the 3,753 companies in the database shared staff compensation numbers in 2011. While this is still a respectable sample size, it is important to check that the sample is reasonably representative over the period analysed. Doing so reveals that the universe of firms with staff expenses data has stayed relatively stable over the last 40 years with the exception of a large increase in 1993 followed by a steady decline to the present day. Meanwhile, the overall number of firms in the Compustat sample is more volatile, with rapid growth to exceed 7,000 in 1996 before shrinking considerably since then.

In terms of employment, the relative size of the two samples evolves similarly to the number of firms. But the samples diverge more when looking at EBITDA and market capitalization – with the entire Compustat database experiencing fast growth in both measures while the staff expenses subsample showing only modest gains. Charts showing the relative figures for each sample, including the CEO pay sample that we introduce shortly, can be found in the appendix.
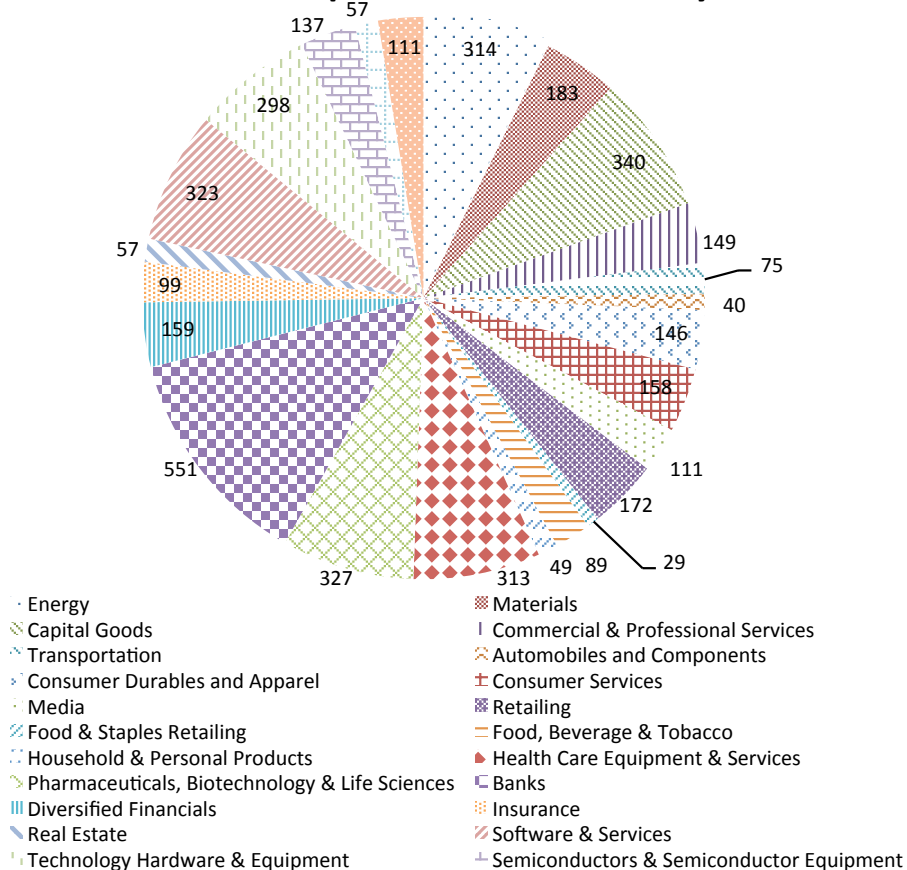
For studying the evolution of factor shares, the divergence in total EBITDA and market capitalization in the last decade of the sample should make us wary. At first glance, the difference should if anything bias the measurable capital share downwards over time, since the relative number of employees between the two samples is much more consistent. One way to control for the changes could be by comparing them with the national account factor shares but that in itself would introduce another bias, since the BEA measures purely domestic value added and gross operating surplus versus worldwide consolidated figures for the firm-level data.

More importantly though, the distribution of value added between factors can vary considerably across sectors, with capital-intensive industries such as manufacturing exhibiting very different factor shares to the service sector such as IT or consulting firms. As shown in the charts below, although we can be fairly confident that a broad spectrum of industries is represented in our staff expenses sample, some sectors have very few observations per year while the financial sector is strongly over-represented. This will need to be taken into account, as detailed in subsequent paragraphs.

2008 Staff Expense Sample Observations by sector

Legend:
- Energy — Materials
- Capital Goods — Commercial & Professional Services
- Transportation — Automobiles and Components
- Consumer Durables and Apparel — Consumer Services
- Media — Retailing
- Food & Staples Retailing — Food, Beverage & Tobacco
- Household & Personal Products — Health Care Equipment & Services
- Pharmaceuticals, Biotechnology & Life Sciences — Banks
- Diversified Financials — Insurance
- Real Estate — Software & Services
- Technology Hardware & Equipment — Semiconductors & Semiconductor Equipment
- Telecommunication Services — Utilities

2008 Whole Compustat Observations by Sector

Legend:
- Energy — Materials
- Capital Goods — Commercial & Professional Services
- Transportation — Automobiles and Components
- Consumer Durables and Apparel — Consumer Services
- Media — Retailing
- Food & Staples Retailing — Food, Beverage & Tobacco
- Household & Personal Products — Health Care Equipment & Services
- Pharmaceuticals, Biotechnology & Life Sciences — Banks
- Diversified Financials — Insurance
- Real Estate — Software & Services
- Technology Hardware & Equipment — Semiconductors & Semiconductor Equipment

Among financial sector firms, it is especially banks that dominate the sample. Indeed, almost all banks report total staff compensation, whereas many other industries are more sparsely represented. The difficulty is that banks' capital structure is highly unusual. Profits to revenue ratios are higher than most industries, especially over the last thirty years. And although banks' revenue to asset ratio is much lower compared to many other sectors, banks are also highly leveraged. Within the financial sector as a whole, a great deal of variation could also be expected. It is unclear therefore how representative factor shares for the financial sector might be compared to economy-wide measures.

The potential pitfalls in using unbalanced data without adjustment are therefore particularly acute for computing factor shares. Unadjusted shares using the sample are contained in the appendix as testimony. To compensate for this sectoral imbalance, we introduce a weighting scheme in order to get a less biased representation of factor share evolution for the companies included in Compustat. The retained method involves computing a 5-year moving average of industry weights by EBITDA for the whole Compustat sample, and then scaling the contributions of each firm in the staff expenses subsample to obtain similar aggregate weights for both samples. While the method is not without drawbacks, it allows us to obtain reasonably representative data with a straightforward and consistent adjustment.

This paper therefore features two datasets: the sample of firms in Compustat for which staff compensation data are available, and the subsample of these firms for which executive compensation is also available. The next section will analyse the larger sample to get an understanding of the evolution of factor shares in the broader set of firms. We will then move to the executive-staff expenses subsample to see how the evolution of factor shares correlates to the evolution of top earners within firms.

3. Measurement and Evolution of Factor Shares

Recent research into factor shares and their measurement has revived a literature that had been somewhat dormant since the 1960s. For many years, factor shares were considered to be more or less constant (Goldfarb & Leonard, 2005). Defining factor shares can also prove problematic, both in theory and in practice. The basic definition of the labour share starts by dividing national income by total employee compensation. But this definition isn't entirely satisfactory when considering the top officers of a company. Many business leaders are both employees and owners, so categorizing their salaries as part of the labour share can introduce biases – especially if they are

incentivized to optimize their income classification for tax purposes. Furthermore, many approaches are possible when treating self-employed workers' incomes. Krueger (1999) points out several of the pitfalls of various measures and alternatives. Gollin (2002) describes how standard measures underestimate labour shares in small firms. Ultimately, many proposals have been made to improve on basic measures. Since we will restrict ourselves to analysing factor incomes in the corporate sector, a requirement for simplicity will guide this paper's approach.

A good place to start is the definition of gross value added. The following definition (Gomme & Rupert, 2004) is generally accepted:

$Gross\ Value\ Added$
$$= Compensation\ of\ Employees + Corporate\ Profits + Rental\ Income$$
$$+ Net\ Interest\ Income + Proprietors'\ Income + Indirect\ Taxes\ Less\ Subsidies$$
$$+ Depreciation$$

Labour income is fairly unambiguously compensation of employees. Defining capital income can be somewhat more controversial, given the presence of proprietors' income in gross value added as explained earlier. Many conventions attribute proprietors' income according to the labour-capital shares obtained from splitting the portion of value added that excludes it. This is done for instance by various sources when computing the shares of private business income. Since we will be restricting ourselves to the corporate sector for the most part, this issue is less problematic. Indeed, proprietors' income is quite clearly accounted for in corporate profits in the form of dividends.

A common national accounts measure for capital income in the corporate sector is gross operating surplus. Gross operating surplus is essentially the sum of corporate profits, rental income, net interest income and depreciation. This suits our purpose nicely, since it has a clear equivalent in firm-level data in the form of Earnings Before Interest, Taxes, Depreciation and Amortization (EBITDA).

Thus the only remaining question for this paper's approach in calculating factor shares concerns the denominator, which in most calculations is simply gross value added as defined above. At firm level however, indirect taxes less subsidies is not often reported, and is excluded from easily comparable measures such as EBITDA or EBIT. Therefore when making our own calculations, we will use value added as the denominator, defined as the sum of employee compensation and gross operating surplus (or EBITDA at firm

level). Fortunately, this is unlikely to be distortive in any significant way since the share of indirect taxes less subsidies in gross value added is remarkably constant over time according to the BEA.

Two easily accessible mainstream sources detailing the distribution of income among factors are the BEA's National Income and Product Accounts (NIPA) and the Bureau of Labour Statistic's labour share indices. Both sources provide estimates for different sectors of the economy, such as *Nonfinancial Corporations* or *Nonfarm Business*, with the BEA reporting the levels of shares while the BLS reports changes in index form. Dishearteningly, while both purport using the same source data, the evolution of the corporate business labour share measured by NIPA is somewhat less volatile than the BLS private business index.

Many reasons for this discrepancy are explored in the literature[7], most of which revolve around accounting for self-employed and proprietor shares. Another reason could very well be linked to idiosyncratic differences between the corporate and non-corporate business sectors, although this seems somewhat implausible given that the NIPA report data on overall private sector industries since 1987 that do not replicate the BLS series (see appendix). Note that the BEA does however caution use of the private industries series due to unreliability and changing methodologies early in the sample.

With the caveats listed above in mind, the NIPA and BLS series offer an excellent starting point in discussing the evolution of factor shares in the United States. The BLS series since 1970 is presented below:

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[7] See for instance Krueger (1999), Gollin (2002), Rupert & Gomme (2004) or Freeman (2011)
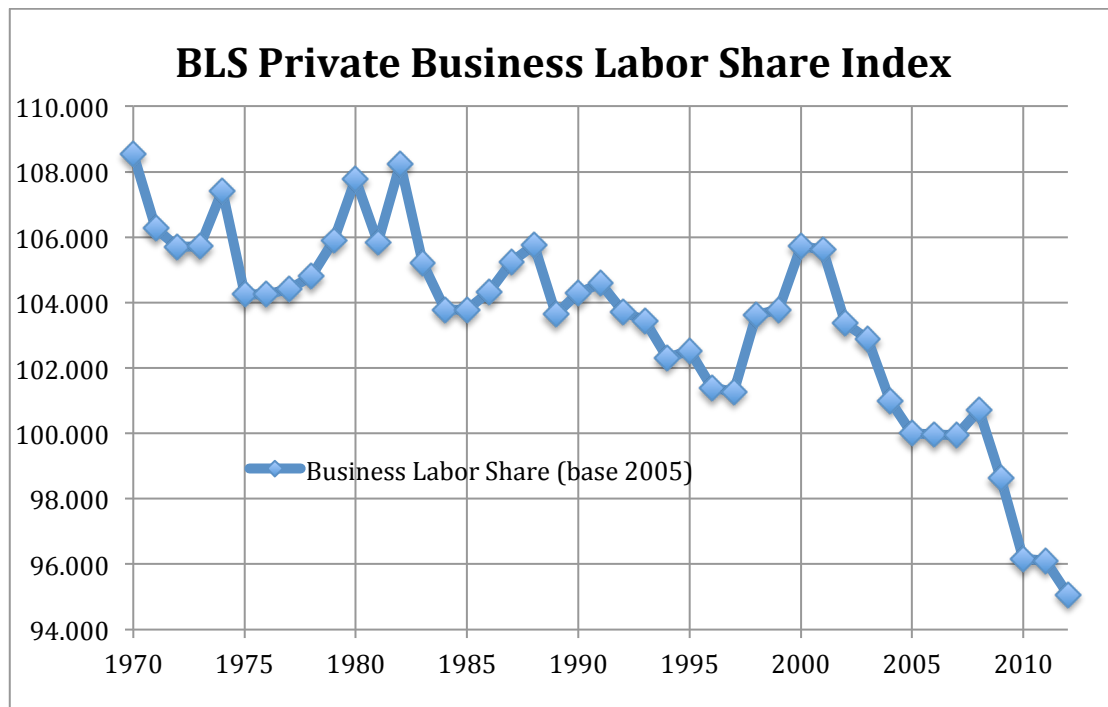
For the purpose of analysing the NIPA data, we define the labour share as employee compensation over value added and the capital share as gross operating surplus over value added, where value added is the sum of employee compensation and gross operating surplus. The following shares emerge over the same period:
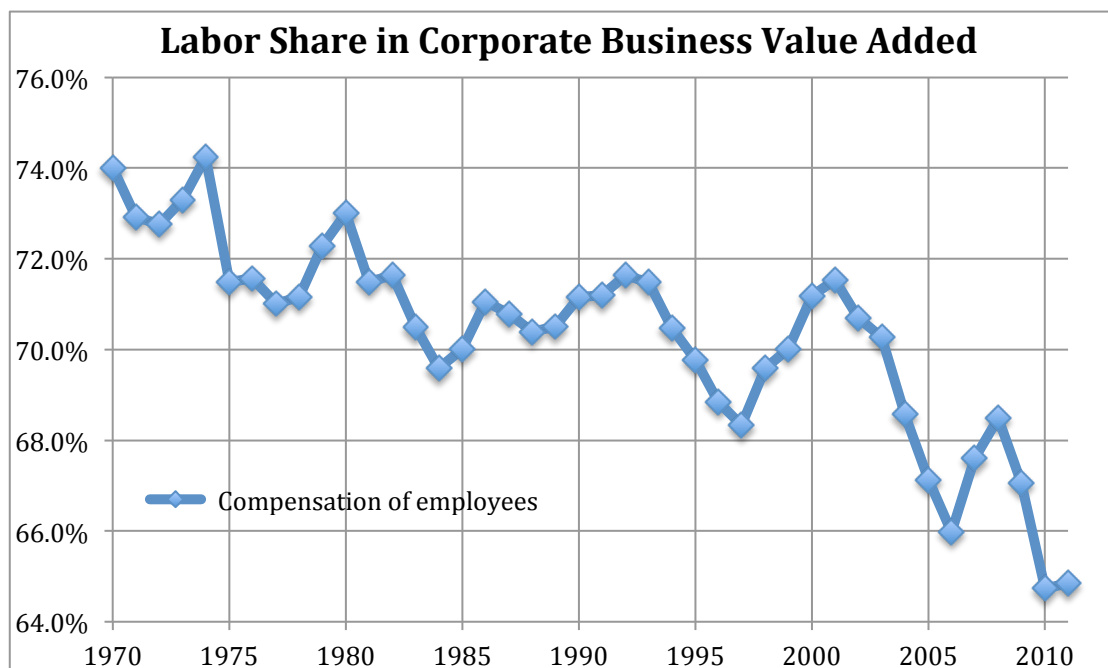
Despite the methodological consistency concerns outlined previously, both series exhibit a very similar trend: the labour share in value added has fallen by over 10% since 1970. The fall occurs in stages after a near recovery in 1980 to the 1970 levels,

with the largest fall occurring since 2000. This in itself is a remarkable decline and is a trend unseen since the Great Depression (Piketty & Saez, 2003). Such a decline might very well help explain the pattern of top earners increasing their share of capital income along the lines argued in the introduction to this paper, especially in the last decade. However the growth in top income shares began in the 1980s, and the evolution of domestic factor shares from the NIPA and BLS data does not exhibit such a steep trend until 2000. Put bluntly, we might expect the capital share to have increased more and earlier given the evolution household-level income shares. In the following paragraphs, we will investigate whether looking at firm-level data might hold some clues.

Looking at the subsample of firms in Compustat reporting staff expenses over the period from 1970 to 2011, defining value added as EBITDA plus staff compensation and applying the industry weighting scheme detailed previously, the following picture emerges:
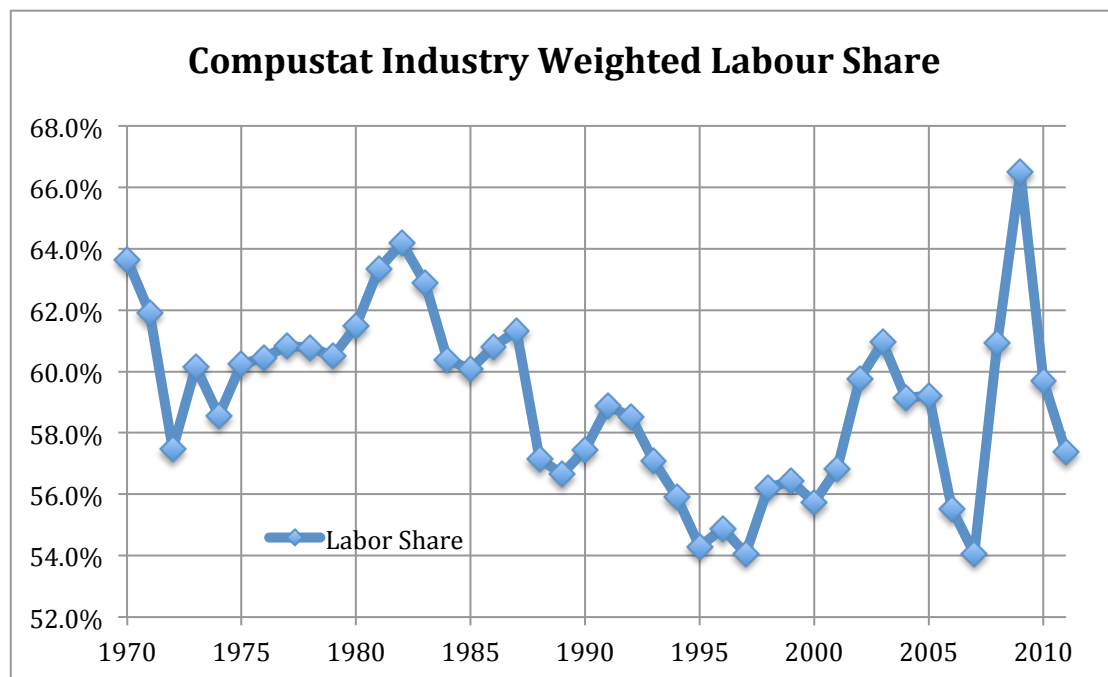
There are several aspects to this graph that stand out. First of all, the labour share level is considerably lower for our sample relative to the NIPA and BLS measures. To a certain extent, a lower share might be expected given that the corporations in Compustat are among the largest in the country and so would benefit from economies of scale and greater access to capital. But by the same argument, and recalling the sheer weight of US listed firms in overall corporate value added, there would have to be a very big difference in factor shares between smaller and larger firms to explain the near 10-percentage point gap. This is hard to imagine.

Another cause may be simply due to the sampling process. But assuming our weighting scheme gives a reasonable representation of the overall evolution of factor shares in the Compustat universes of listed US firms, it is more likely the difference reflects the nature of those firms' activities. Indeed, contrary to the national accounts measures, these firms report figures for EBITDA and staff compensation on a consolidated basis. This means that the results of American multinationals with controlling interests in foreign subsidiaries will contain results from activities on foreign soil. How should this feature be interpreted?

There are several possible answers of course, and none of them are definitive. However, it is important to note that while the evolution of wage income in the United States is clearly related to purely domestic activities, the evolution of capital income is not. Thus the proportion of multinationals' staff expenses going to foreign workers impacts US workers only indirectly through the effect of foreign competition on wages. On the other hand, domestic shareholders in US firms benefit directly from operating surpluses earned abroad. This is reinforced by the fact that US corporations are overwhelmingly domestically owned. Despite nearly doubling over the last 20 years, foreign ownership of US equities stood at only 13% in 2010, with combined bond and equity foreign ownership of 16%[8].

Therefore, while the impact of changes in multinationals' internal share of domestic vs. foreign labour compensation may or may not affect the evolution of domestic wage income shares, changes in the same firms' overall factor shares will almost certainly affect overall US income shares. Hence the higher and increasing capital share among the largest US corporations relative to the whole corporate sector may very well be an important part of the reason why the capital share of top earners' income has increased markedly since 1980, as has their share of overall income. It is also reasonable to assume that much of US top earners' capital, when not engaged in entrepreneurial activities, is placed in large domestic corporates' equity and bonds.

Ideally then, we would like to study the evolution of domestic vs. foreign labour costs inside multinationals to get a more accurate understanding of what is happening within the labour share. Unfortunately unconsolidated data is very hard to find, and even aggregate level data is sparse. The NIPA publishes tables on international flows between US multinationals' domestic and foreign affiliates, but only extensively so since 1998. Data before then differs on a yearly basis and is inconsistent in scope, making analysis difficult and time consuming. Nevertheless, a look at recent developments may still be

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[8] US Census 2012 Statistical abstract

informative. The chart below details the labour share in majority-owned foreign affiliates of US non-bank corporations over the period from 1997 to 2008, using the NIPA employee compensation and value added definitions:
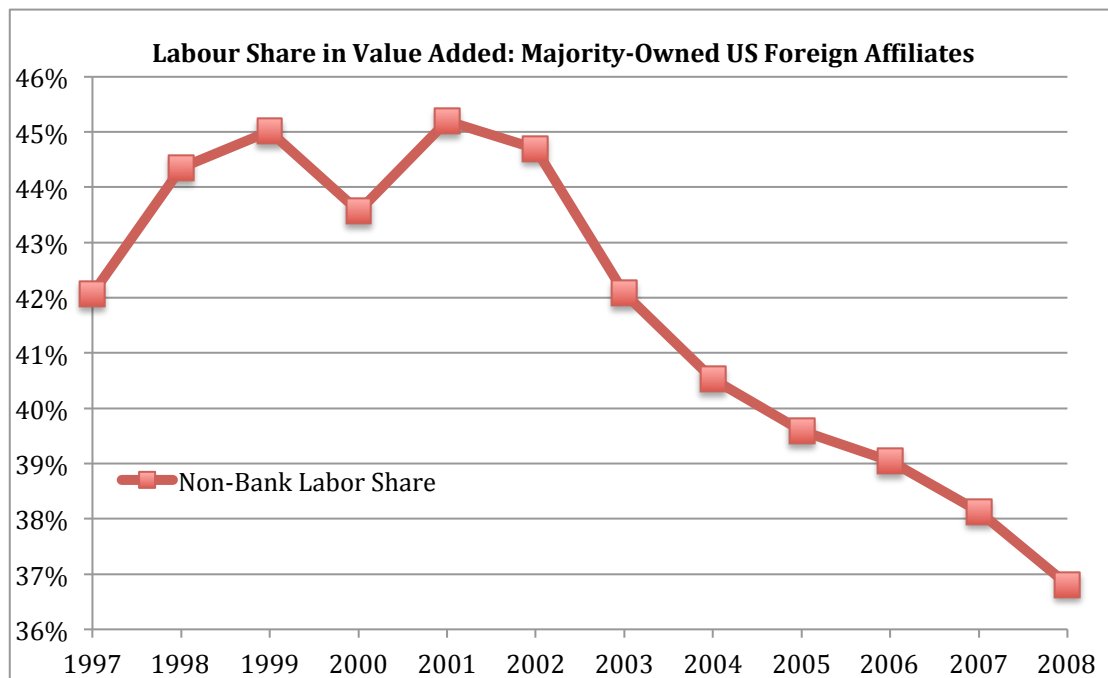
Labour Share in Value Added: Majority-Owned US Foreign Affiliates

While a lower level might have been expected compared to the domestic NIPA data and Compustat estimates, these figures are still remarkably low. Bearing in mind that real value added by the non-bank foreign affiliates nearly doubled from 1997 to 2010, this is a significant development. Although direct comparisons are tricky due to the different corporate activity scopes, the value added of non-bank affiliates was 17% of the NIPA figure for the entire US domestic corporate sector in 2010. If we assume that all the parent US multinationals are domestically listed, and compare an estimate for foreign affiliate EBITDA to the Compustat aggregate EBITDA for 2010, the number jumps to 35%. From the point of view of employment, the affiliates employed 11 million workers in 2010, 10% of the NIPA estimates for the entire US private sector. Again, if all the parent companies were listed, foreign affiliate employment would represent 31% of the 2010 aggregate corporate employment according to Compustat data.

These numbers are to be taken with a pinch of salt of course, and not only because of comparability issues. The EBITDA and value added figures in particular might be misleading, since US corporations could be increasingly aggressive in booking operating surplus in foreign affiliates for tax purposes. Nevertheless, the developments hold striking implications for returns to shareholders and domestic workers. If the associated

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growth in earnings is simply to avoid US tax authorities, it is also avoiding the firms' US employees.

Going back to the factor shares measures from our Compustat factor shares subsample, another notable feature is the higher volatility relative to the NIPA and BLS, especially in the face of the most recent crisis. Looking specifically at upticks in the labour share, they are almost all associated with US recessions and there aftermath. Indeed, the US economy was in recession during 6 months in 1980, from mid 1981 to late 1982, mid 1990 to early 1991, during 2001 and from late 2007 to mid 2009. So, apart from a 2-percentage point gain from 1995 to 1996, there is a pretty unambiguous downward trend in the data since 1980, which is interrupted only by recessions. That the labour share climbs in recessions is understandable given that gross operating surplus is the more volatile component of value added compared with relatively stable staff compensation. The extent of increases in labour share is also strongly related to the severity of the recessions, which is even truer for our Compustat sample than for the aggregated BLS and NIPA data.

While the higher volatility may be expected from using a smaller sample, the more drastic effect of the crisis is most likely to be linked to our sample's structure. Using a moving average industry-weighting scheme to compensate for the strong presence of banks among the sample certainly improves the representativity drastically, as evidenced by the raw shares shown in the appendix. But the sheer scale of the banking crisis is very difficult to correct for, given the size of recent losses experienced by major players, the large weight of the financial sector in US value added over the period and the consolidation of the sector since 1980. The swing in factor shares from the 2007 to 2009 displayed by our sample cannot be ignored, but it must be understood in proper context.

So, looking at various measures and indicators for factor shares at both aggregate and firm level, a picture emerges of an increasing capital share and associated decline in labour share since 1980. This evolution is particularly true for the largest firms in corporate America, where the capital share is already lower throughout the period compared to the aggregate data. Although it is hard to obtain a clear picture from the limited data available, it seems that some of this difference may be explained by the fact that firm level data contains the foreign value added of multinationals compared to the purely domestic aggregate measures. The trend appears especially strong in the last decade, as reflected by the NIPA data on multinationals' foreign affiliates. All these observations indicate that a considerable portion of increasing top income shares, which

to a large extent come from capital income at the very top (0.1%) of the distribution, is linked to a shift in the share of value added away from labour and towards capital.

Given that the contribution of wage income to the top 1% incomes is stable over the period however, this shift must also have been accompanied by increasing wage inequality. A cursory glance at the Execucomp data confirms that top executives within these very same firms form a large part of the country's highest wage earners. A more detailed analysis is called for.

4. CEO pay and labour share

Returning to the initial observation that the recent growth in inequality has been driven by gains at the very top of the distribution – the top 1%, 0.1% and 0.01% – it is important to question as to where we might expect such striking changes to originate precisely. Indeed, the threshold for membership of the top 1% is relatively low by the standards of top officers in corporate America: $349 thousand in 2011 income excluding capital gains[9]. Even the threshold for membership of the top 0.5%, at $508 thousand, might not be unattainable for executives in large firms. To illustrate, fewer than 5% of all US corporate executives reported in Execucomp earned less than $349 thousand in 2011 and only the 11% lowest paid earned less than $508 thousand[10].

Equally pertinently, the thresholds for membership of the top 1% and top 0.5% wage earners are lower even, at $325 thousand and $454 thousand respectively in 2011. That means less than 4% of executives and 8% of executives were excluded from the top 1% and 0.5% wage earners respectively. The proportions are similar in the subsample of firms reporting staff expenses that we will analyse in the next section, with only a couple of percentage points more executives below each threshold[11]. Tables detailing the numbers of executives from the Forbes & Execucomp samples whose pay exceeded the thresholds for membership of the various top income groups as defined by Piketty & Saez are contained in the appendix. We highlight a few of these figures in the following paragraphs.

Going further up the pay ladder, 68% of executives reported in Execucomp earned more than the $1.04million threshold for the top 0.1% wage incomes in 2011. Exclusive

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[9] Thresholds obtained from Table 0, Piketty & Saez (2003) updated data, available on Emmanuel Saez' website.

[10] 869 of 8157 executives of US companies in Execucomp earned less than $508 thousand in 2011, and 350 executives earned less than $349 thousand.

[11] In the executive pay-staff expenses matched sub-sample, the numbers are 180 of 1259 executives earning less than $508k and 76 of 1259 earning under $349k.

membership of top incomes shares for executives only begins when looking at pay above $4.32 million, the threshold for the top 0.01% wage incomes, for which only 19% of executives were concerned. In terms of membership numbers, the top 0.01% consisted of 10,480 families in 2011. Assuming that all executives are the only wage earners in their families, 16% of the top 0.01% in 2011 were executives from our Execucomp sample. Under these very conservative assumptions, it becomes clear that our top 19% executives are very well represented amongst the top 0.01% earners in the country.

These figures having been obtained with the most conservative of assumptions, it is highly likely that the numbers of individuals earning these levels of compensation is much smaller than 10 thousand. It is therefore probable that a large majority of the population of executives whose compensation is reported in Execucomp will be very well represented amongst the families at the highest level of the income distribution for which we have data. Computing factor shares for the companies these executives lead will thus bring strong clues as to whether the bargaining dynamic described earlier is indeed present: did the capital share of value added also increase substantially for these firms since 1980?

Before investigating the link between CEO and the labour share of value added, a few basic trends should be presented. To get the broadest possible view, we will first use the widest dataset available, the combined sources of the Forbes 800 from 1970 to 1991 and Execucomp since 1992. Thus we are able to say that in 1970 all CEOs in the Forbes 800 every single one was among the top 1% wage incomes in the United States[12]. Indeed, all but 1 was among the top 0.5% income earners. Most CEOs (65%) found themselves in the top 0.01% to top 0.01% in 1970. Even when looking at the distribution of income from all source (except capital gains)[13], 88% of CEOs in the top 0.1% earners and 27% in the top 0.01%. We can therefore say with certainty that already in 1970, CEOs of major companies were among the very highest earners in the country.

From 1992 onwards, the Execucomp data includes top company executives as well as CEOs. On average companies reported just over 5 executives in 1992. In this year, 70% of these executives were between the top 0.5% to 0.01% of the wage income distribution, and 10% of executives were in the top 0.01%. In the absence of information

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[12] Pay is total compensation including bonus, stocks, stock options and deferred compensation. All references to top income shares from now on will be for top wage incomes excluding capital gains.
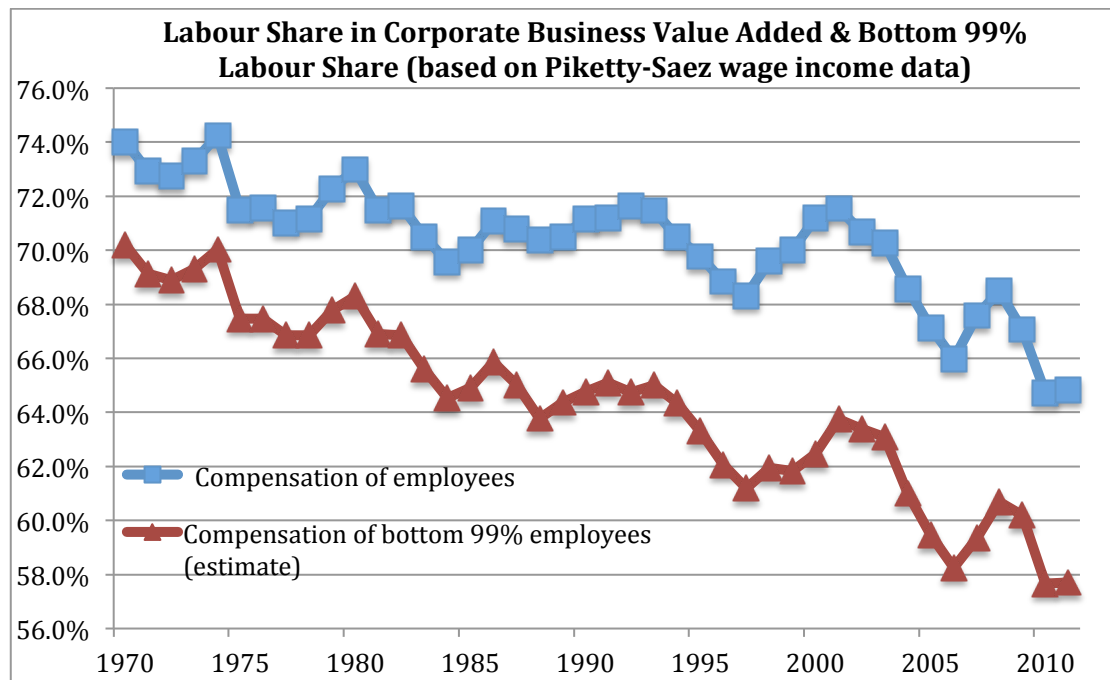[13] C.f. Appendix.

on non-CEO executives from 1970, it is difficult to say whether this represents a large shift. But unless the compensation distribution was especially flat at board level, it is likely that the boards as whole were getting much better representation at the top of the income distribution in 1992 than 1970.

Fast-forward to 2011 and the proportion of executives earning salaries placing them in the top 0.01% doubled as mentioned previously. Among CEOs the proportion was over 40%, a ratio substantially greater than the Forbes data from 1970 for a sample over twice the size. Looking again at the 68% of all executives were in the top 0.1% of wage earners, this meant that a large number had made the jump from earning merely enough to be in the top 0.5% in 1992 to the top 0.1% by 2011[14]. Clearly then, more and more CEOs are receiving salaries placing them at the very top of the income distribution, and they are bringing their fellow board members up the distribution with them. These facts alone are testimony to the increasing inequality within the labour share.

Indeed we can get a picture of how the overall labour share has evolved with respect the bottom 99%. Using the NIPA labour share data presented earlier, it is straightforward to scale the raw data using Piketty & Saez' yearly data on the wage income distribution. Doing so shows how comparatively lower wage earners have seen their share of value added fall twice as much as the overall labour share. Given the trends exposed by Piketty & Saez, this is hardly surprising. Since that the executives whose pay is included in our sample represent but a top fraction of the top 1%, we will struggle to obtain a strictly equivalent population at the micro-level. Nevertheless, a similar concentration might be expected to exist in the very top echelon of listed corporations.

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[14] 74% of the Execucomp executives were among the top 0.5% wage earners in 1992.

Labour Share in Corporate Business Value Added & Bottom 99% Labour Share (based on Piketty-Saez wage income data)

- Compensation of employees
- Compensation of bottom 99% employees (estimate)

We now move to the sample of firms from Compustat for which we have both executive pay data and overall staff expenses, whose size varies from 200 to 300 over the period from 1970 to 2011. Computing the ratio of CEO pay to overall staff expenses for the period, and adding the ratio of total executive pay to staff expenses from 1992 onwards, we obtain the following graph:

CEO & Executive Pay vs Staff Expenses

Executive-CEO share of Staff Expenses

- CEO Pay/Staff Expenses
- Executive Pay/Staff Expenses
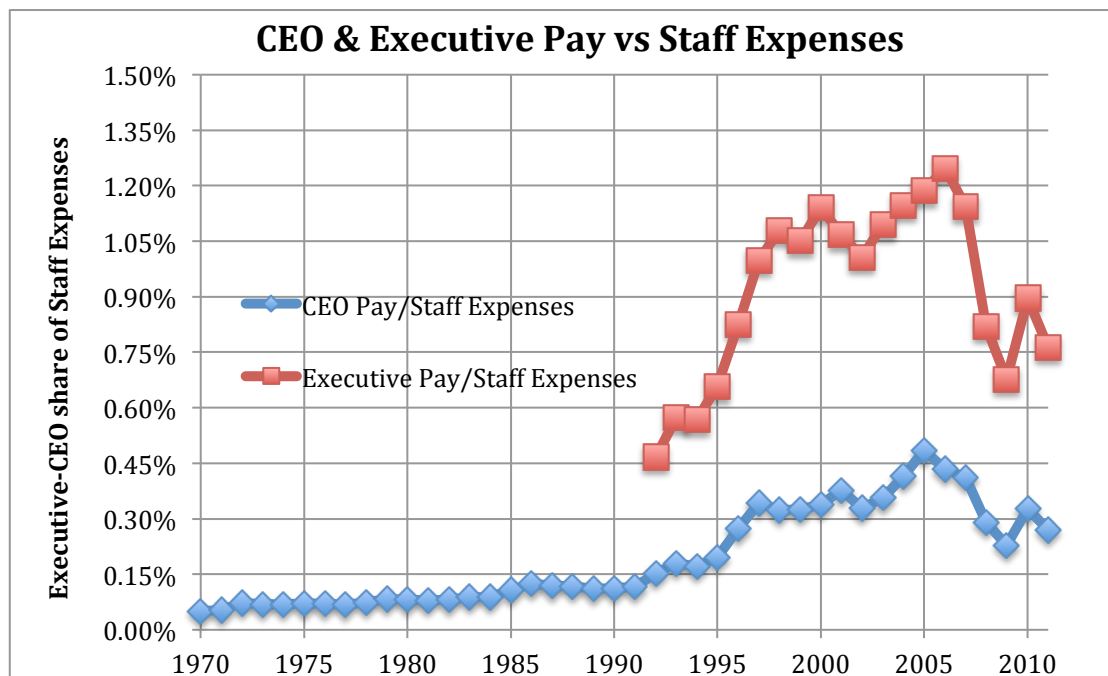
Before the recent crisis, CEO pay had increased nine-fold since 1970 relative to their firms' total staff expenses. And over the shorter period since 1992, the proportion of total compensation going to executives had tripled. These figures are very much in line

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with the evolution of the overall income distribution. However, there are significant difficulties when directly comparing the Piketty-Saez income distribution figures and the firm-level data. Indeed, the income distribution figures pertain to households – meaning in many cases the earnings come from two people. Our data on executive pay is at the individual level. Furthermore, the overall labour compensation figures used in income distribution analyses – the denominator – are for domestic income. At firm level, the figure available to us is global payroll. Looking at the NIPA data for corporate value added, employee compensation in foreign affiliates with US parents was at least 10% of domestic payroll in 2010. It is reasonable to expect that the listed firms in Compustat represent a large fraction of US multinationals, making the ratio of foreign to domestic payroll much higher for our sample. Superimposing the wage income distribution's evolution on the graph above, these differences appear clearly:
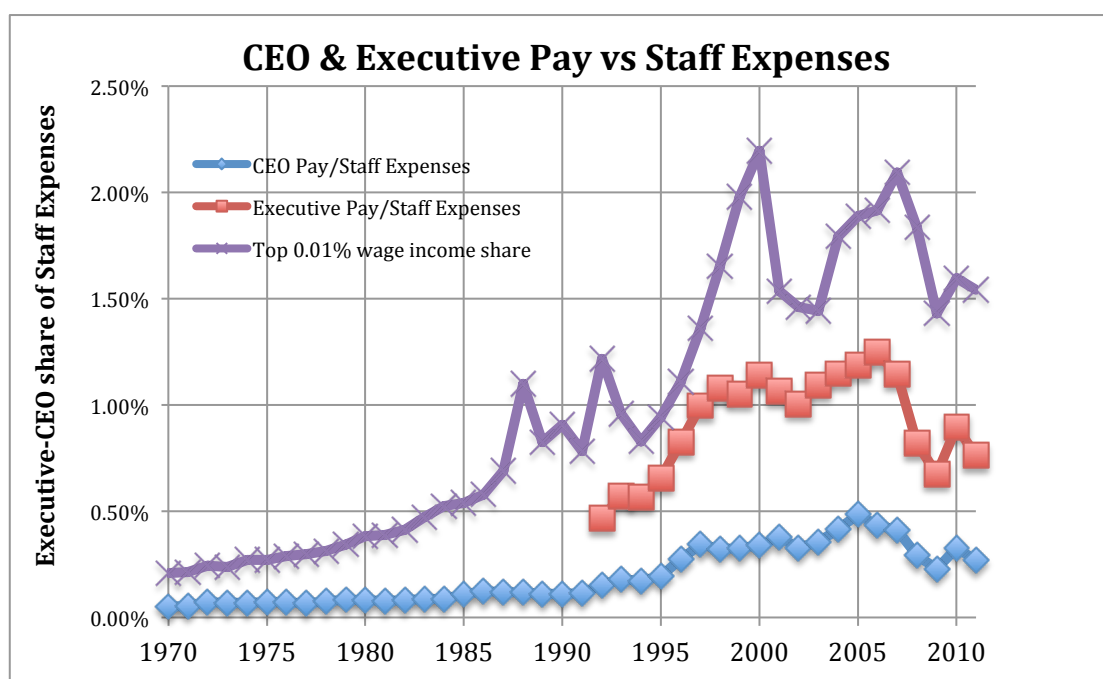
The two trends follow each other quite closely, although the percentage level of corporations' wage bill going to executives is lower than the economy as a whole. These executives counted for 0.015% to 0.030% of total employees over the period (0.020% in 2011). At first glance, one might expect the executives' share of staff expenses to be higher than the countrywide average, both given their numbers and the weight of the firms they manage. Furthermore, a larger fraction of executives (20%) working for firms that declare staff expenses earned above the threshold for membership of the top 0.01% wage earners in the country, compared to the wider Execucomp dataset.

The lower level for top earners' share of payroll relative to the income distribution could be explained by the methodological differences outlined above. For instance, it does not

seem unreasonable to assume that executives form households with well-paid partners, reconciling the curves somewhat. But looking at the composition of our sample, given that these figures are raw numbers, we might wonder whether the oversampling of financial firms could also be at play. Indeed, looking at anecdotal evidence such as the recent requirement in several countries for banks to declare their top bonus recipients, financial firms could be unusual in that executives are not always the highest earners at their firms. Thus star traders and salesmen have also obtained a large share and increasing share of staff compensation and value added. These other potential members of the top 0.01% earners do not feature in our firm-level executive pay data.

From the perspective of our bargaining story, the role of these other top earners should also be significant. Indeed, the share of capital in value added increased even more in the financial sector than in the whole economy over the last 30 years. Hence the difference between the raw and weighted factor share graphs computed over the Compustat staff expenses sample as reported in the appendix. Workers with direct influence on the relative increase in capital income, whether in management or directly reporting to management, are well placed to capture a share of the increase at the expense of colleagues further down the production chain. Again, investors may not worry too much about the size of the piece taken out by high earners as long as their slice of the pie is increasing even more.

To be sure that firms' top earners in our sample, such as executives and CEOs, are gaining at the expense of the rest of their colleagues, we must show that income gains are disproportionate at the top. Looking at the evolution of average wages and executive compensation for the sample, this becomes obvious:
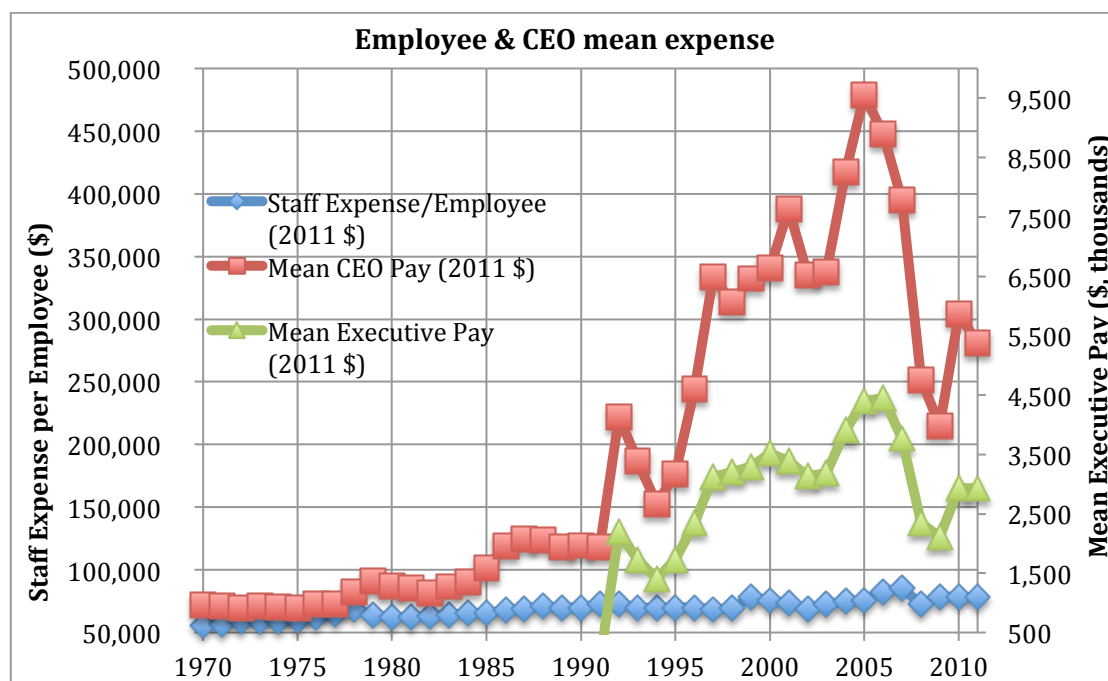
There are several points of notes. First of all, mean real wages in the sample have been relatively stagnant, with gains of less than 25% from 1980 to 2011. Second and baring in mind the sample effects of switching from the Forbes data to the larger Execucomp sample in 1992, the rate of growth of CEO pay was increasing for much of the period from 1980 to the peak just before the crisis. The picture also shows that mean CEO pay increased faster than mean executive pay, thus income concentration amongst top earners does not end at board level.

Another way of looking at this picture would be to look the evolution between top officers' share in payroll relative to everyone else. Given that we only have access to executive pay data from 1992 and bearing in mind the pay inequality increase occurring even at board level, we shall restrict ourselves to CEOs' share relative to the rest of staff. This also has the advantage that while fluctuating slightly, the number of CEOs per employee in our sample is pretty steady over the period, generally hovering around 0.004%. The following graph thus roughly represents the top 0.004% vs. 99.996% wage earners in our sample. Although the share taken by the CEO is small, it is surprisingly large given the tiny number of CEOs. It has also increased remarkably over the 20 years especially, even accounting for the effect from changing data sources in 1992.

CEO Shares in Compensations vs Rest of Staff
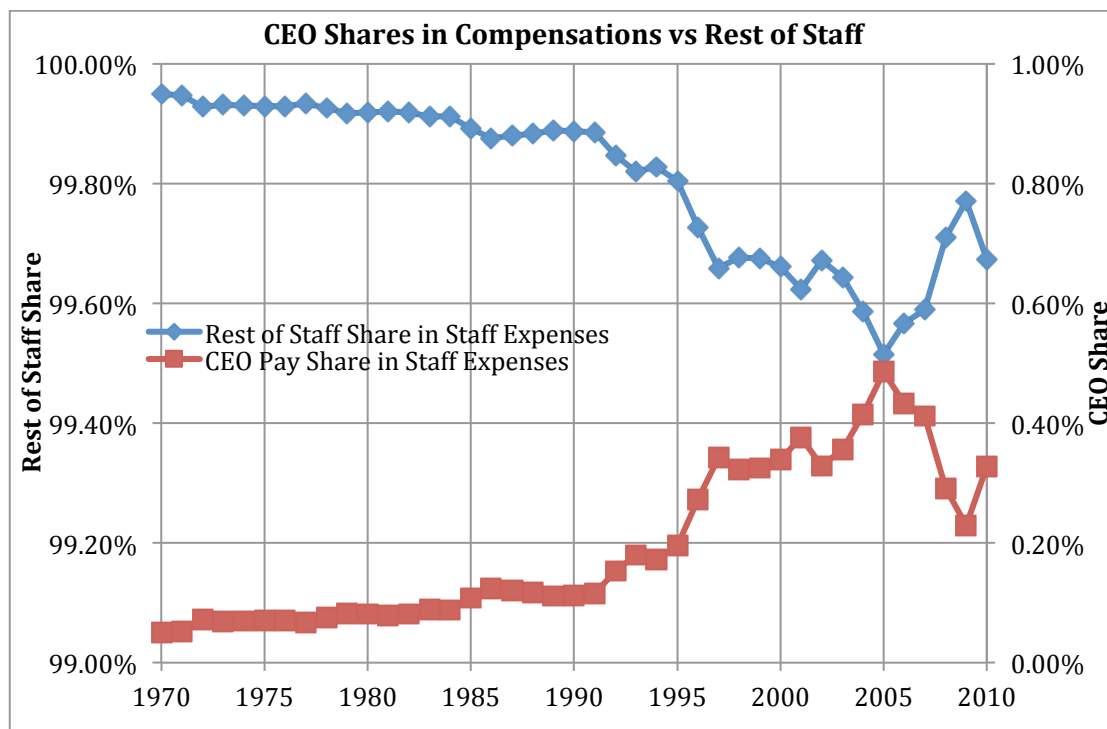
The anecdotal evidence that CEOs may be bargaining for larger shares of staff compensation is therefore strong. But is CEO pay directly, at firm level, related to increases in the capital share? Looking at the sample of firms for which we have CEO pay and are able to compute factor shares, there is a clear relationship between increasing mean CEO pay and decreasing labour share. One must continue to bear in mind the jump in 1992 which is due to switching from Forbes to Execucomp data for CEO pay, but this doesn't detract from the correlation.

CEO Pay vs Labor Share in Staff Expenses Sample
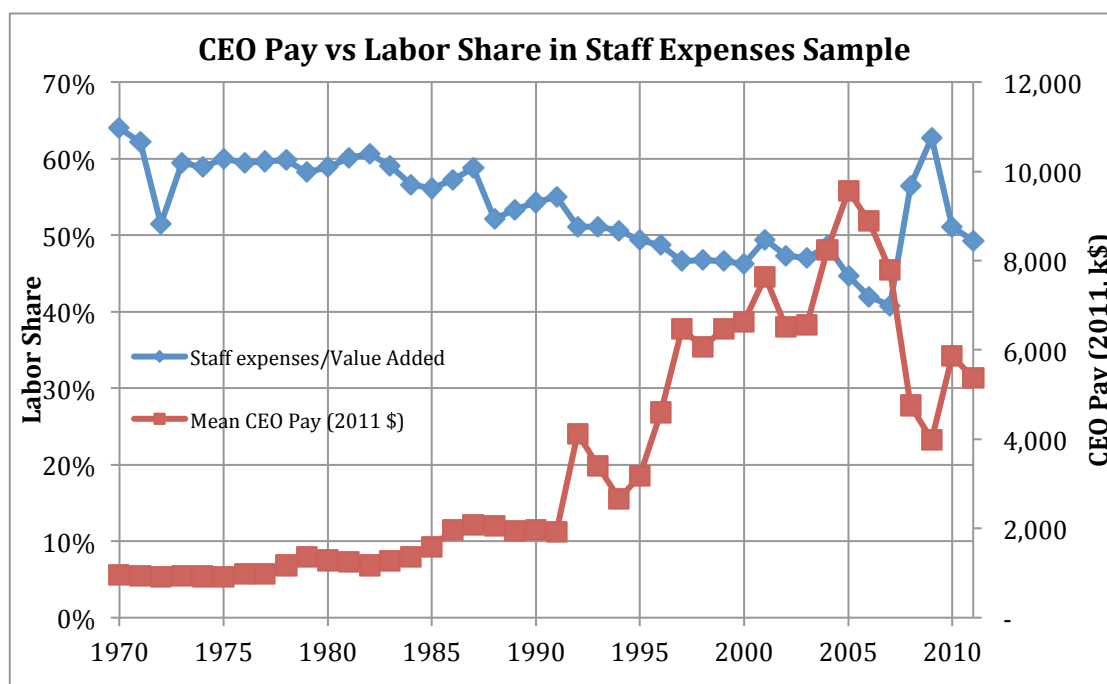
Although the correlation is suggestive, by itself this graph does not imply any bargaining effect along the lines discussed. Indeed, it may be simply the result of CEO pay becoming better aligned with investors' income, i.e. the capital share. In which case, bargaining may be a factor, but it is not clear that CEOs are paid more when they decrease the labour share. However, a simple check would be to see if those CEOs that are better paid tend to work in firms that lower the labour share more. We therefore present the same graph as above, taking into account only those firms that pay their chief executive better than half of all CEOs:
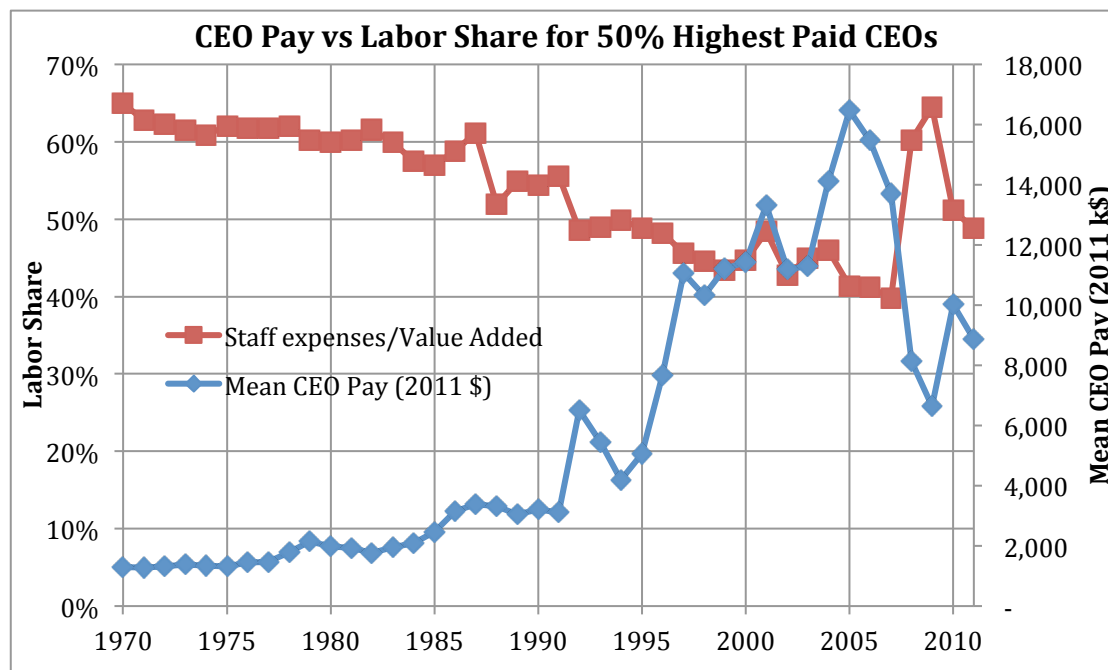
While more volatile, the pattern is even starker for firms employing the highest 50% paid CEOs. Note for instance that the labour share for these firms tends to lead the series covering the wider sample. Of course, mean CEO pay is also much higher and rises faster over the period. Again though, this in itself is not sufficient evidence of CEOs being incentivised to bargain down the labour share. The crucial test will be how firms with the top 50% paid CEOs compare to the bottom 50%.

CEO Pay vs Labor Share for 50% Lowest Paid CEOs
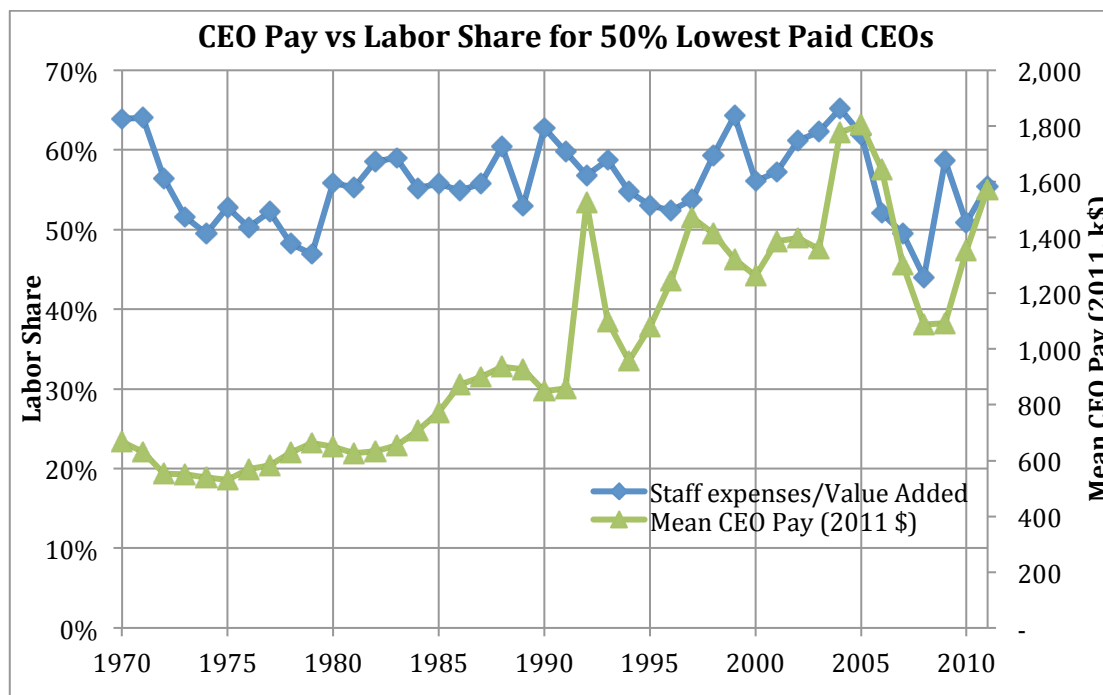
While CEO pay for the bottom 50% of the sample still rises considerably over the period, the labour share does not show the same negative trend as in the top ranked CEO sample. In fact, it actually seems positively correlated in some portions of the graph. Without going so far as to suggest that bargaining effects run the other way for lesser-paid CEOs, the lack of discernable pattern is very much in line with what we might expect if CEOs were incentivised to lower the labour share. There is also clear evidence of CEOs capturing a larger part of the capital share in all the samples presented, so there are likely to be several bargaining games going on.

Another way of testing whether our hypothesis holds would be to regress CEO pay on companies' labour share in value added. It will be important to controlling for indicators strongly correlated with CEO pay, such as market capitalisation, CEO age and tenure and firm size in the form of revenues, as well as industry, crucially. In the spirit of Piketty, Saez & Stantcheva (2013), as well as running the regression on the full sample, we will split the sample into two periods: high and low tax periods. Should the coefficients prove significantly different, it would indicate that CEOs potential bargaining efforts are elastic to tax cuts.

The main result, as detailed in the appendix, shows that there is indeed a strong difference between the coefficients on firm level labour share in a low and high tax environment. The coefficient is significant in the low tax environment, but insignificant or weakly significant in the high tax environment, with the result robust to controls. Importantly, the sign of the effect is as expected, with reductions in the employee share

in value added associated with an increase in CEO pay. However, the yearly effect is quite small, with a 1 percentage-point fall in labour share accompanying a $3 thousand pay increase.

Furthermore, the causality of the relationship is debatable, since CEOs may be earning more due to an increase in capital income that only incidentally lowers the labour share. It might therefore be that the bargaining incentives are not entirely linked to competition with other firms to increase the capital share. Plausibly, there are other necessary conditions for CEOs to exploit all their bargaining channels, such as poor corporate governance for instance. Thus if a board isn't held accountable to its investors, it might not be held accountable to its employees either. There are almost certainly complex interactions with other institutions as well, such as trade unions and liberalisation. Nevertheless, added to the evidence surveyed previously, it is hard to reject the hypothesis that CEO bargaining is associated with lower factor shares.

5. Conclusion

This paper provides a variety of evidence for the link between simultaneously rising capital shares in value added and top shares in labour income. While the data surveyed is imperfect and on an individual basis may be inconclusive, the entire set provides compelling evidence that increasing capital shares in the United States over the last 30 years are strongly linked with increasing top labour shares. Specifically, CEOs and executives, who have a strong role in bargaining with workers for both the share of value added and the distribution of the labour share, are increasing their income shares proportionally with the very highest income earners in the country. The role of multinationals is especially compelling, since factor shares in foreign affiliates of US parent companies exhibit sharply lower levels than domestic shares. Given the ownership of US firms is still very domestic, gains in value added from off shoring invariably go to capital owners.

Furthermore, although we were able to correct some of the bias linked to the large presence of banks among firms reporting staff expenses, the story this paper tells is inevitably linked to developments in financial institutions. Indeed, the exceptional growth of the sector over the last 30 years leading up to the current crisis made finance a large diver of profit growth, reaching a peak of nearly 30% of all US corporate profits early in the last decade. This, combined with the capital structure of banks and spill over effects, may mean that much of the rising inequality and decline in factor shares is

intricately linked to the rise of finance. Identifying causality is a challenge here, and the crisis may lead to a return to more modestly sized sector, blurring the picture.

There is much more work to be done on investigating the evolutions of factor shares and firm-level income distributions. It is especially important to compare evolutions in other countries to the US case outlined here, since the extent to which the changes reflect globalization is not entirely clear. Further international comparisons would also help in understanding how much changes in taxation are behind the joint decline of labour shares and rising income inequality. Whichever of these aspects best represents the underlying mechanisms at work, it is likely that bargaining plays a strong role in the wider dynamic.

Appendix

Top 1% US Pre-Tax Income Share, 1913-2011
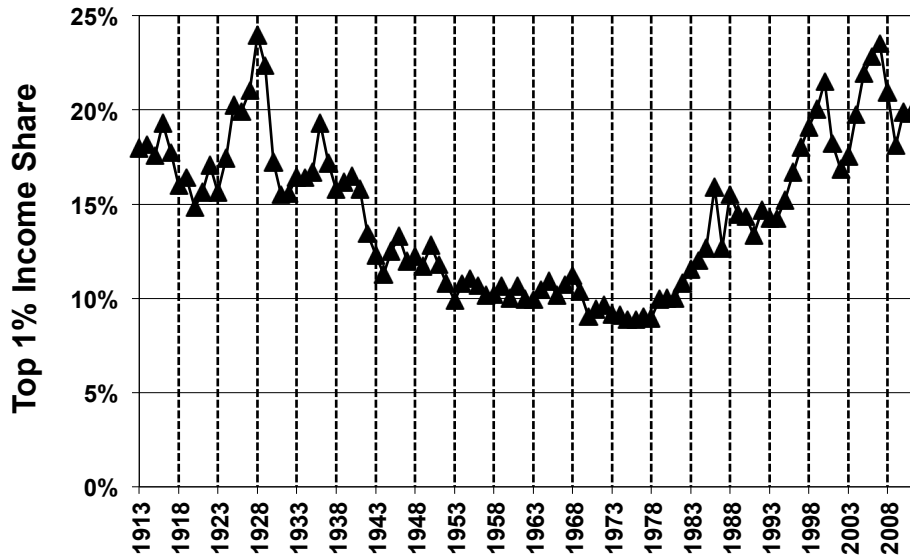
Source: Piketty and Saez, 2003 updated to 2011. Series based on pre-tax cash market income including realized capital gains and excluding government transfers.

Full Sample vs CEO Pay Sample no. Factor Share Observations

Observations (Full Sample)   Observations (CEO Sample)

Sample EBITDA Representativity

Total Corporate Capital VA benchmark (2011 $)

Full Compustat Sample EBITDA (2011 $)

Compustat Staff Expenses Sample EBITDA (2011 $)

CEO-Staff Expense Sample EBITDA (2011 $)

2011 Dollars (millions)

Compustat Factor Shares (Industry Weighted)

Compustat unweighted factor shares

CEO Top Income Group Membership for Combined Forbes & Execucomp Data

Fiscal Year	CEO Pay Above Threshold for Top Income Group (excl. K gains)								
	N° CEOs in Sample	N° CEOs in Top 1%	% CEOs in Top 1%	N° CEOs in Top 0.5%	% CEOs in Top 0.5%	N° CEOs in Top 0.1%	% CEOs in Top 0.1%	N° CEOs in Top 0.01%	% CEOs in Top 0.01%
1970	**723**	722	100%	718	99%	636	88%	196	27%
1971	**766**	764	100%	762	99%	675	88%	237	31%
1972	**836**	832	100%	829	99%	739	88%	302	36%
1973	**829**	824	99%	814	98%	716	86%	278	34%
1974	**814**	813	100%	801	98%	662	81%	206	25%
1975	**803**	802	100%	798	99%	694	86%	234	29%
1976	**777**	776	100%	776	100%	684	88%	269	35%
1977	**778**	777	100%	775	100%	697	90%	293	38%
1978	**796**	796	100%	796	100%	727	91%	320	40%
1979	**795**	795	100%	793	100%	726	91%	414	52%
1980	**808**	808	100%	805	100%	740	92%	341	42%
1981	**787**	787	100%	785	100%	722	92%	366	47%
1982	**797**	797	100%	796	100%	730	92%	267	34%
1983	**791**	791	100%	790	100%	733	93%	231	29%
1984	**766**	765	100%	764	100%	713	93%	199	26%
1985	**766**	766	100%	764	100%	702	92%	243	32%
1986	**769**	769	100%	767	100%	731	95%	295	38%
1987	**765**	764	100%	763	100%	674	88%	198	26%
1988	**741**	739	100%	735	99%	590	80%	98	13%
1989	**784**	760	97%	754	96%	602	77%	134	17%
1990	**785**	773	98%	768	98%	605	77%	162	21%
1991	**752**	739	98%	737	98%	628	84%	163	22%

	CEO Pay Above Threshold for Top Income Group (excl. K gains) cont.								
Fiscal Year	N° CEOs in Sample	N° CEOs in Top 1%	% CEOs in Top 1%	N° CEOs in Top 0.5%	% CEOs in Top 0.5%	N° CEOs in Top 0.1%	% CEOs in Top 0.1%	N° CEOs in Top 0.01%	% CEOs in Top 0.01%
1992	**433**	429	99%	421	97%	356	82%	124	29%
1993	**1157**	1150	99%	1137	98%	914	79%	292	25%
1994	**1551**	1531	99%	1500	97%	1123	72%	296	19%
1995	**1600**	1574	98%	1534	96%	1143	71%	331	21%
1996	**1651**	1620	98%	1578	96%	1130	68%	336	20%
1997	**1674**	1633	98%	1579	94%	1147	69%	380	23%
1998	**1731**	1688	98%	1621	94%	1153	67%	354	20%
1999	**1811**	1745	96%	1656	91%	1144	63%	342	19%
2000	**1792**	1736	97%	1657	92%	1122	63%	355	20%
2001	**1671**	1618	97%	1536	92%	1056	63%	338	20%
2002	**1675**	1618	97%	1561	93%	1134	68%	394	24%
2003	**1742**	1700	98%	1653	95%	1249	72%	463	27%
2004	**1752**	1722	98%	1677	96%	1329	76%	517	30%
2005	**1753**	1715	98%	1662	95%	1312	75%	493	28%
2006	**1867**	1821	98%	1769	95%	1376	74%	534	29%
2007	**2055**	1993	97%	1917	93%	1466	71%	561	27%
2008	**1974**	1908	97%	1846	94%	1390	70%	439	22%
2009	**1909**	1860	97%	1805	95%	1444	76%	468	25%
2010	**1856**	1818	98%	1783	96%	1530	82%	582	31%
2011	**1632**	1603	98%	1575	97%	1392	85%	577	35%

Source: Author's Calculation based on Forbes (before 1992), Execucomp (from 1992) and Piketty & Saez (2003, updated)

	CEO Pay Above Threshold for Top Wage Income Group (excl. K gains)								
Fiscal Year	N° CEOs in Sample	N° CEOs in Top 1%	% CEOs in Top 1%	N° CEOs in Top 0.5%	% CEOs in Top 0.5%	N° CEOs in Top 0.1%	% CEOs in Top 0.1%	N° CEOs in Top 0.01%	% CEOs in Top 0.01%
1970	**723**	723	100%	722	100%	703	97%	475	66%
1971	**766**	766	100%	763	100%	740	97%	449	59%
1972	**836**	833	100%	832	100%	801	96%	474	57%
1973	**829**	827	100%	823	99%	781	94%	487	59%
1974	**814**	813	100%	813	100%	756	93%	434	53%
1975	**803**	802	100%	799	100%	755	94%	431	54%
1976	**777**	776	100%	776	100%	731	94%	431	55%
1977	**778**	777	100%	776	100%	743	96%	432	56%
1978	**796**	796	100%	796	100%	767	96%	488	61%
1979	**795**	795	100%	794	100%	762	96%	502	63%
1980	**808**	808	100%	806	100%	758	94%	462	57%
1981	**787**	787	100%	787	100%	736	94%	450	57%
1982	**797**	797	100%	796	100%	738	93%	383	48%
1983	**791**	791	100%	790	100%	729	92%	343	43%
1984	**766**	765	100%	763	100%	705	92%	323	42%
1985	**766**	766	100%	763	100%	710	93%	338	44%
1986	**769**	769	100%	767	100%	714	93%	359	47%
1987	**765**	764	100%	764	100%	695	91%	295	39%
1988	**741**	739	100%	738	100%	645	87%	198	27%
1989	**784**	761	97%	756	96%	681	87%	283	36%
1990	**785**	773	98%	772	98%	692	88%	290	37%
1991	**752**	739	98%	737	98%	677	90%	303	40%

	CEO Pay Above Threshold for Top Wage Income Group (excl. K gains) cont.								
Fiscal Year	N° CEOs in Sample	N° CEOs in Top 1%	% CEOs in Top 1%	N° CEOs in Top 0.5%	% CEOs in Top 0.5%	N° CEOs in Top 0.1%	% CEOs in Top 0.1%	N° CEOs in Top 0.01%	% CEOs in Top 0.01%
1992	**433**	430	*99%*	425	*98%*	380	*88%*	192	*44%*
1993	**1157**	1153	*100%*	1141	*99%*	975	*84%*	413	*36%*
1994	**1551**	1538	*99%*	1516	*98%*	1256	*81%*	498	*32%*
1995	**1600**	1579	*99%*	1552	*97%*	1277	*80%*	507	*32%*
1996	**1651**	1627	*99%*	1598	*97%*	1318	*80%*	524	*32%*
1997	**1674**	1642	*98%*	1613	*96%*	1321	*79%*	557	*33%*
1998	**1731**	1700	*98%*	1658	*96%*	1332	*77%*	514	*30%*
1999	**1811**	1764	*97%*	1716	*95%*	1344	*74%*	447	*25%*
2000	**1792**	1745	*97%*	1699	*95%*	1294	*72%*	429	*24%*
2001	**1671**	1629	*97%*	1591	*95%*	1234	*74%*	456	*27%*
2002	**1675**	1629	*97%*	1592	*95%*	1286	*77%*	509	*30%*
2003	**1742**	1711	*98%*	1677	*96%*	1395	*80%*	608	*35%*
2004	**1752**	1730	*99%*	1698	*97%*	1455	*83%*	670	*38%*
2005	**1753**	1724	*98%*	1695	*97%*	1456	*83%*	690	*39%*
2006	**1867**	1833	*98%*	1804	*97%*	1552	*83%*	744	*40%*
2007	**2055**	2004	*98%*	1958	*95%*	1644	*80%*	749	*36%*
2008	**1974**	1919	*97%*	1878	*95%*	1591	*81%*	656	*33%*
2009	**1909**	1867	*98%*	1835	*96%*	1596	*84%*	696	*36%*
2010	**1856**	1824	*98%*	1799	*97%*	1643	*89%*	813	*44%*
2011	**1632**	1604	*98%*	1588	*97%*	1462	*90%*	790	*48%*

Source: Author's Calculation based on Forbes (before 1992), Execucomp (from 1992) and Piketty & Saez (2003, updated)

Executive Top Income Group Membership for Execucomp Data

	Executive Pay Above Threshold for Top Income Group (excl. K gains)								
Fiscal Year	N° Executives in Sample	N° Executives in Top 1%	% Executives in Top 1%	N° Executives in Top 0.5%	% Executives in Top 0.5%	N° Executives in Top 0.1%	% Executives in Top 0.1%	N° Executives in Top 0.01%	% Executives in Top 0.01%
1992	8045	7104	88%	5932	74%	2860	36%	517	6%
1993	9821	8780	89%	7573	77%	3805	39%	704	7%
1994	10689	9444	88%	8046	75%	3934	37%	643	6%
1995	11147	9742	87%	8275	74%	4163	37%	767	7%
1996	11696	10111	86%	8459	72%	4113	35%	816	7%
1997	12063	10419	86%	8663	72%	4191	35%	966	8%
1998	12656	10561	83%	8701	69%	4202	33%	920	7%
1999	12214	10266	84%	8430	69%	3953	32%	940	8%
2000	11542	9806	85%	8136	70%	3998	35%	1056	9%
2001	11384	9680	85%	8015	70%	3784	33%	854	8%
2002	11559	10074	87%	8491	73%	4154	36%	904	8%
2003	11817	10506	89%	9070	77%	4819	41%	1103	9%
2004	10904	9984	92%	8922	82%	5071	47%	1163	11%
2005	9388	8689	93%	7834	83%	4599	49%	1044	11%
2006	10965	9718	89%	8538	78%	4949	45%	1138	10%
2007	11806	10387	88%	9082	77%	5164	44%	1212	10%
2008	11263	9936	88%	8662	77%	4490	40%	817	7%
2009	10598	9606	91%	8571	81%	4793	45%	850	8%
2010	10000	9372	94%	8674	87%	5397	54%	1087	11%
2011	8561	8180	96%	7653	89%	5006	58%	1072	13%

Source: Author's Calculation based on Execucomp and Piketty & Saez (2003, updated)

Fiscal Year	N° Executives in Sample	Executive Pay Above Threshold for Top Wage Income Group (excl. K gains)								
		N° Executives in Top 1%	% Executives in Top 1%	N° Executives in Top 0.5%	% Executives in Top 0.5%	N° Executives in Top 0.1%	% Executives in Top 0.1%	N° Executives in Top 0.01%	% Executives in Top 0.01%
1992	8045	7337	91%	6404	80%	3442	43%	837	10%
1993	9821	9035	92%	7997	81%	4483	46%	1125	11%
1994	10689	9761	91%	8589	80%	4955	46%	1241	12%
1995	11147	10111	91%	8849	79%	5088	46%	1337	12%
1996	11696	10562	90%	9231	79%	5363	46%	1445	12%
1997	12063	10840	90%	9524	79%	5447	45%	1559	13%
1998	12656	11203	89%	9645	76%	5418	43%	1413	11%
1999	12214	10847	89%	9445	77%	5245	43%	1257	10%
2000	11542	10326	89%	8975	78%	5010	43%	1312	11%
2001	11384	10149	89%	8786	77%	4874	43%	1198	11%
2002	11559	10417	90%	9151	79%	5255	45%	1254	11%
2003	11817	10765	91%	9581	81%	5860	50%	1571	13%
2004	10904	10235	94%	9382	86%	6088	56%	1686	15%
2005	9388	8902	95%	8303	88%	5651	60%	1679	18%
2006	10965	10086	92%	9187	84%	6281	57%	1811	17%
2007	11806	10747	91%	9733	82%	6439	55%	1772	15%
2008	11263	10291	91%	9342	83%	5897	52%	1360	12%
2009	10598	9805	93%	9001	85%	5960	56%	1418	13%
2010	10000	9498	95%	8932	89%	6379	64%	1690	17%
2011	8561	8233	96%	7849	92%	5849	68%	1668	19%

Source: Author's Calculation based on Execucomp and Piketty & Saez (2003, updated)

Annual CEO Pay Regressed on Firm-level Factor Share

VARIABLES	(1) Staff Expense Sample	(2) Top MTR < 50%	(3) Top MTR >= 50%	(4) Staff Expense Sample	(5) Top MTR < 50%	(6) Top MTR >= 50%
Staff Expenses/Value Added	-54.95	-330.6*	-7.651*	-40.88	-294.5**	-4.233*
	(50.71)	(174.3)	(4.306)	(36.07)	(149.4)	(2.246)
End of year market capitalisation (2011 $, millions)				0.160***	0.171***	0.0441***
				(0.0126)	(0.0143)	(0.00560)
Revenues (2011 $, millions)						
CEO age	92.69***	141.8***	12.55***	80.83***	112.2***	9.312***
	(12.70)	(22.36)	(2.841)	(12.14)	(21.26)	(2.866)
CEO tenure	-2.481	22.85	1.268	-24.51***	-24.80	7.622***
	(9.379)	(16.40)	(2.931)	(8.898)	(15.47)	(2.855)
Observations	9,136	5,380	3,756	9,124	5,380	3,744
R-squared	0.174	0.140	0.218	0.247	0.219	0.207
Industry Group Controls	yes	yes	yes	yes	yes	yes
Year Fixed Effects	yes	yes	yes	no	no	no
Trend Control	no	no	no	no	no	no

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Annual CEO Pay Regressed on Firm-level Factor Share (continued)

VARIABLES	(7) Staff Expense Sample	(8) Top MTR < 50%	(9) Top MTR >= 50%	(10) Staff Expense Sample	(11) Top MTR < 50%	(12) Top MTR >= 50%	(13) Staff Expense Sample	(14) Top MTR < 50%	(15) Top MTR >= 50%
Staff Expenses/Value Added	-41.68	-296.8**	-5.716*	-33.70	-267.5**	-5.718*	-38.89	-289.5*	-6.125*
	(36.49)	(150.6)	(3.344)	(31.78)	(135.2)	(3.088)	(36.23)	(158.0)	(3.455)
End of year market capitalisation (2011 $, millions)	0.144***	0.151***	0.0185***	0.137***	0.142***	0.0208***	0.145***	0.151***	0.0228***
	(0.0150)	(0.0180)	(0.00504)	(0.0150)	(0.0181)	(0.00489)	(0.0150)	(0.0180)	(0.00490)
Revenues (2011 $, millions)	0.0259**	0.0322**	0.0288***	0.0276***	0.0366**	0.0251***	0.0236**	0.0312*	0.0242***
	(0.0104)	(0.0163)	(0.00475)	(0.0105)	(0.0163)	(0.00461)	(0.0103)	(0.0163)	(0.00451)
CEO age	80.96***	113.7***	7.647***	78.85***	113.5***	8.026***	79.90***	114.7***	8.399***
	(12.14)	(21.39)	(2.806)	(12.07)	(21.45)	(2.604)	(12.11)	(21.39)	(2.692)
CEO tenure	-25.69***	-26.73*	7.715**	-21.27**	-21.23	5.787**	-24.57***	-22.62	6.093**
	(8.929)	(15.47)	(3.089)	(8.772)	(15.42)	(2.928)	(8.923)	(15.44)	(2.907)
Observations	9,124	5,380	3,744	9,124	5,380	3,744	9,124	5,380	3,744
R-squared	0.248	0.220	0.245	0.264	0.234	0.297	0.251	0.221	0.287
Industry Group Controls	yes	yes	yes	yes	yes	yes	yes	yes	yes
Year Fixed Effects	no	no	no	yes	yes	yes	no	no	no
Trend Control	no	no	no	no	no	no	yes	yes	yes

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

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