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Employee Value Added: A New Measure of Gain-Sharing between Labor and Capital

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United Parcel Service, or UPS, is a solidly profitable company. In 2020, it had $11.0 billion of after-tax operating profit. And by subtracting from this $11 billion of operating profit a capital charge of $6.7 billion, one can see that UPS had $4.4 billion of Economic Value Added, or EVA. This $6.7 billion is not a cash charge and so, unlike interest expense, it does not show up on the company's P&L. It's a measure of UPS investors' "opportunity cost"—one you can estimate by multiplying the company's total debt and equity capital (about $106 billion) by its weighted average cost of capital. If we assume this cost is 6.3%, the opportunity cost or capital charge for UPS is $6.7 billion, which leaves us with a $4.4 billion EVA or economic profit.

These kinds of calculations of economic profit are routinely made by public companies' largest and most sophisticated investors. But what even many of the world's most sophisticated and successful investors may well have failed to appreciate is the large and growing amount of economic value that UPS has long been creating for its *employees*, a group that now numbers almost 520,000. The average total compensation, including the value of employee benefits, of UPS employees in 2020 was $86,000. This translates into *total* employee pay of about $44 billion—which, it's interesting to note, is roughly *four times* the company's after-tax operating profit of $11.0 billion. And since employees, like investors, think about their options and opportunity costs, it's useful to compare UPS employee pay with what we think is their best alternative, or what we call their "market pay."

Using aggregate labor market data from the Bureau of Labor Statistics (BLS) and employee pay data for comparable industries and competitors (like FedEx) from Compustat, we estimated the average annual "market pay"—and hence the opportunity costs—for UPS employees in 2020 to have been $67,000, or $19,000 less than their actual pay. With 519,000 employees earning $19,000 more than their market pay—and giving that number a 25% haircut for corporate income taxes that makes it $14,000—we get an "employee value added" by UPS of $7.5 billion.[3] And if we go on to note that the company's employee value added is almost double its EVA, or investor value added, we see a gain-sharing arrangement between labor and capital that tilts heavily toward labor.[4]

FedEx, by contrast, has a quite different sharing arrangement, one that includes *negative* employee value added of $5.2 billion in 2020 for its 542,000 employees, who produced some $1 billion of EVA in that year. To the extent we can rely on just

1 See the Appendix for an explanation of how to calculate net operating profit after-tax (or NOPAT), Capital, including a reconciliation of UPS's NOPAT with its GAAP net income.

2 UPS is one of the roughly 15% of U.S. companies that actually discloses labor costs (see https://www.forbes.com/sites/shivaramrajgopal/2021/05/17/labor-costs-are-the-most-pressing-human-capital-disclosure-the-sec-should-consider-mandating/?sh=22287a4e5192). The income statement related to the 2020 10-K states that compensation and benefits are $44.5 billion and the average number of employees is 519,000. Hence, the average wage of $86,000.

3 We calculate employee value added after corporate tax to leave total value added unchanged when dollars are shifted from EVA to employee value added, or vice versa.

4 Positive employee value added should not be interpreted as suggestng that employees are paid more than their marginal product. Employee market rates are survey averages with considerable dispersion around the average, so many companies will be paying "above market." But, again, this doesn't imply that such companies are paying above their estimate of the employee's marginal product.

these two measures, we can view UPS as providing considerably larger social benefits as a public company than FedEx.

For another, very different gain-sharing setup, let's now turn to the case of Gilead Sciences, the highly profitable maker of drugs for treating HIV, hepatitis C, and other diseases. In 2020, the company had $15.9 billion of after-tax operating profit, of which $12.5 billion represented EVA—all while operating with only 13,000 employees. These 13,000 employees made an average of $384,000, which was $88,000 more than the $296,000 that our labor market analysis estimated as the opportunity cost for Gilead employees (a number we arrived at by looking at the average pay of a group of companies that includes the likes of Biogen and Amgen). And after giving this $88,000 a 25% tax haircut and multiplying it by the company's 13,000 employees, we get an estimate of Employee Value Added at Gilead of $800 million. Although well below UPS's $7.5 billion, this $800 million is still an impressive number, especially when viewed on a per-employee basis. But when viewed through a different lens—namely, in relation to its investors' returns—Gilead's employee value added amounts to less than one fifteenth of the company's EVA, or investor value added.

A Brief Digression on Stocks vs. Flows

When thinking about these numbers, it's important to keep in mind that these measures of employee and investor value added at UPS, FedEx, and Gilead are all *single-period*, or "flow," indicators. One of our major aims in this study is to understand how these flow measures relate to, and possibly affect, the *multi-period or capitalized* "stock" amounts of value, and how such stocks of value are being divided between employees and investors, labor, and capital.

For example, at the end of 2020, the market enterprise values (or the total values of debt and equity) were $194 billion for UPS and $119 billion for Gilead. These market values play a particularly important role in our analysis by allowing us to see not only *current levels* of profitability and employee pay, but also investors' *expectations* about future pay and EVA. And as discussed in more detail later, what we call a company's "future growth value"—it's basically the part of a company's current market cap that can't be accounted for by putting a perpetuity multiple on its *current* operating earnings—can be viewed as projecting its future series of increases in EVA.

For example, whereas the median S&P 1500 company has a future growth value that represents roughly 40% of its current value, our estimate of future growth value at UPS at the end of 2020 was just $4 billion, or little more than 2% of its $194 billion market cap. One possible explanation for such limited growth value may have been investor concern that future gain-sharing at UPS would tilt even more heavily toward employees, providing smaller gains for investors.

But in Gilead's case, the prospects looked considerably worse, with expected future growth valued at a *negative* $227 billion. Such hugely negative growth value at Gilead is widely construed as a sign that investors are anticipating a plunge in profitability when Gilead's patents expire. (And it seems worth noting here that if human capital values became as widely reported and readily accessible as stock values, we might be able to estimate employee future growth values to determine the extent to which Gilead's employee value added was expected to drop along with its EVA.)

In the pages that follow, we summarize the findings of our attempts to measure employee value added for S&P 1500 companies over the past 25 years. In so doing, we show how our measures can be used to get a better understanding of the extent of the gain-sharing—and hence the degree of alignment (or conflict) of interests—between labor and capital at U.S. public companies.

Our analysis of the employee and investor value added by America's largest public companies has led us to three main conclusions:

(1) The aggregate employee value added of S&P 1500 companies is substantial; in 2020 alone, it exceeded $100 billion, representing about 30% of the total value added by S&P 1500 companies for their investors and employees.

(2) We find no detectable change over time in the gain-sharing between employees and capital. Employees' share of their companies' total value added remains today pretty much the same as it was 25 years ago.

(3) Employee value added is no greater, on average, at positive-EVA companies than at negative-EVA companies; and most companies show little correlation between their changes in EVA and employee value added over time.

Finally, our analysis can be interpreted as suggesting that the vast majority of companies treat employees more as "fixed income" than equity partners by limiting the upside, and especially the variability, of their pay. Nevertheless, we do find successful companies with a remarkably strong alignment of labor and capital value added. Perhaps the most notable example is the extent of Costco's gain-sharing with its employees while providing a consistently high EVA for its investors. At the same time, the scarcity of Costco imitators combined with other findings provides little support for the proposition that investors would benefit from providing employees with more equity-like pay—and the greater risks associated with it.

HOW WE ESTIMATE TOTAL PAY AND MARKET PAY

The basic building blocks of employee value added are total employee pay and aggregate market pay. Some companies, like UPS, report total employee compensation expense in their annual report; it was $44.5 billion in 2020. Others, like Gilead Sciences, report only median employee compensation in their proxy statement, $250,000 in 2020. For companies like Gilead, we use an industry group model to estimate the difference between mean and median pay. The model allows us to estimate how that difference is expected to increase along with increases in median pay and sales per employee and gives us our estimate of average pay of $384,000 for Gilead.

To estimate average market or "opportunity cost" pay for a given company, we start with the Bureau of Labor Statistics (BLS) National Compensation Survey data on Employer Costs of Employee Compensation. (We use BLS employer cost data instead of its wage survey data because it includes the employee benefit costs that are included in annual report compensation expense.) Beginning with an average total compensation for all civilian workers in 2020 of $79,000, we adjust this mean for differences among industries that we estimate (using U.S. public company data) by dividing industry average pay by the employment weighted average of all U.S. public companies. This procedure gives us industry adjustments (or "differentials") that range from -75% for Hotels, Restaurants & Leisure to +274% for Bio-Technology. The differential for Air Freight & Logistics of -16% has the effect of reducing average market pay for UPS from $79,000 to $67,000, while the differential for Bio-Technology, +274%, increases average market pay for Gilead from $79,000 up to $296,000. See the appendix for more detail on our methodologies.

EVA, Employee Value Added, and Total Value Added

One way to judge the social value of our largest public companies, as already suggested, is simply to estimate the amount of total value they create for arguably their two most important stakeholders: their investors and their employees. Using the approach outlined above, and for the same year 2020, we calculated the employee value added, EVA, and total value added of every company in the S&P 1500.

Figure 1 lists the top 25 U.S. companies in terms total value added—again, EVA or investor value added plus employee value added. At the top of that list is Apple, whose total value added of $61.3 billion in 2020 is broken down (see Table 1) into $59.5 billion of EVA and $1.8 billion of employee value added. Apple's EVA is its net after-tax operating profit (or NOPAT) of $71.7 billion minus a capital charge of $12.1 billion.

The calculation of Apple's employee value added begins with the company's average employee pay for its 142,000 employees of $109,000; and after determining that the average market alternative for such employees is $92,000, we find that the average pay premium for Apple employees is $17,000, or $12,000 after assuming a 25% corporate tax rate. With this average pay premium shared by 142,000 employees, Apple's employee value added comes out to $1.8 billion.

But this means that employees' share of total value added at Apple, one of America's most admired and successful companies, amounts to just 3%, an even smaller share than what we saw earlier at Gilead. And it thus begs the question: what share of total value added should we expect employees to command in our largest, most successful companies?

To answer this question, let's start with the old idea that successful public companies involve a kind of "partnership" between labor and capital. And let's also remind ourselves that business partnerships are often set up to make each partner's share of income equal to the partner's share of the initial investment, whether it takes the form of financial capital, human capital, or some combination thereof.

To the extent we accept this as our working model, we would expect employees' share of a company's total opportunity costs—that is, the sum of its EVA capital charge and employees' (after-tax) market pay—to provide a reasonable proxy for employees' expected share of the company's total value added.

And the case of UPS cited earlier comes reasonably close to meeting this expectation. As we saw earlier, the company's employee value added of $7.5 billion represents about 63% of its total value added of $11.8 billion. And using the partnership model as our working hypothesis, we would expect the employee share of opportunity cost to be roughly the same. But what we find is that the after-tax opportunity cost of UPS's workforce—which we estimate at close to $26 billion ($50,000 x 520,000)—is almost *four* times its capital charge of $6.7 billion and, as such, represents about 80% of the *total* opportunity cost of the company's human and financial capital.

Figure 1

Highest Total Value Added in 2020

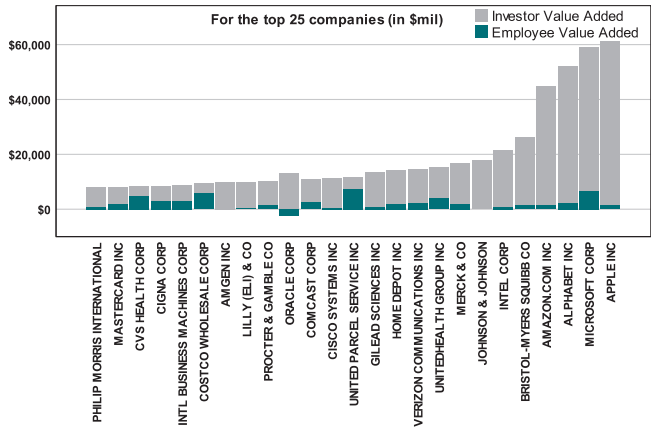


Figure 2

Employee Share of Total Value Added in 2020

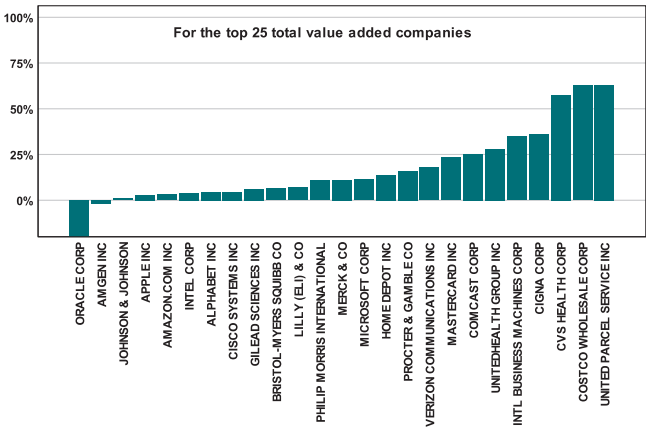


Table 1

Ticker	Company Name	NOPAT ($mil)	Capital Charge ($mil)	EVA ($mil)	Average Pay ($000)	Market Pay ($000)	Pre-tax Pay Premium ($000)	Total Employees (000)	Tax Rate	Employee Value Added ($mil)	Total Value Added ($mil)	Capital Charge Per Employee ($000)	Employee Share of Total Value Added	Employee Share of Total Opportunity Cost
AAPL	APPLE INC	71,655	12,147	59,507	109	92	16	142	25%	1,751	61,258	86	3%	45%
WMT	WALMART INC	16,171	10,887	5,284	39	43	-4	2,250	25%	-7,185	-1,901	5		87%
COST	COSTCO WHOLESALE CORP	5,297	1,709	3,588	74	43	31	264	25%	6,037	9,625	6	63%	83%
GILD	GILEAD SCIENCES INC	15,931	3,403	12,528	384	296	88	13	25%	834	13,362	268	6%	45%
UPS	UNITED PARCEL SERVICE INC	11,049	6,659	4,390	86	67	19	519	25%	7,451	11,841	13	63%	80%

But now let's go back to the case of Apple, where employees' portion of the total value added is a meager 3%. Here our analysis shows that Apple's 142,000 employees represent a considerably higher fraction—45%—of the company's total opportunity cost, which might suggest that their 3% share of value added is surprisingly low. But it also contains some other possibilities. For one thing, it reminds us that the capital intensity of setting up Apple's operations is likely to determine the initial sharing arrangement.[5] But it also suggests that given these initial expected contributions by labor and capital, the company's managers and directors believe that Apple can be an attractive place to work without treating employees as equity partners.

But to examine these two possibilities further, let's look more closely at some of the other companies in our sample. As can be seen in Figure 2, the employee share of total value added at the top 25 value-adding companies ranges from a low of a *negative* 20% at Oracle to 63% at UPS and Costco. At the same time, however, it's important to keep in mind that the average employee at UPS has considerably lower pay, $86,000, than the Apple average of $109,000, as well as the lower market alternative of $67,000 vs. $92,000.

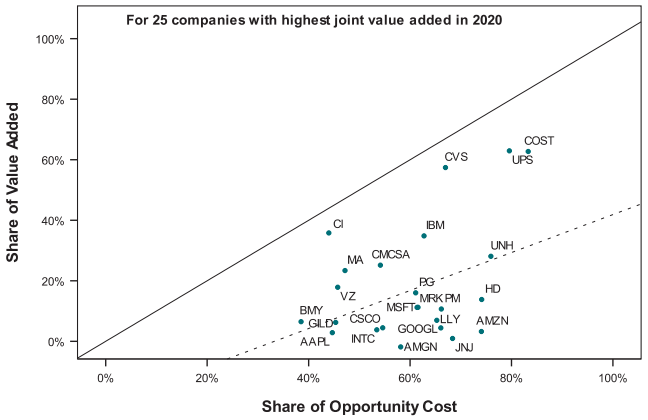
But one striking insight provided by this analysis is that, when viewed on a per-employee (and pre-tax) basis, although UPS's employee value added of $19,000 is somewhat higher than at Apple's $16,000, the difference seems surprisingly small. But since UPS's 519,000 employees so greatly outnumber Apple's 142,000, we shouldn't be surprised to learn that aggregate employee value added at UPS is more than four times Apple's, $7.5 billion vs. $1.8 billion.

For its investors, to be sure, UPS is a much less profitable company, earning EVA of only $4.4 billion as compared to Apple's $59.5 billion. But the fact that the employee share of value added at UPS is almost 80% of the employee share

5 Apple's decision to outsource rather than own most of its manufacturing also ends up reducing the labor intensity of its own operations. And to the extent the outsourcing firm—say Foxconn—underpays it employees—one might view Apple's employee value added as overstated. In defense of our method, Apple has made a choice not to operate in a labor-intensive business, effectively shifting those commitments to other companies.

Figure 3

Employee Share: Value Added vs. Opportunity Cost



of opportunity cost makes UPS much more of an equity-like partnership—one in which employees' share of income is similar to their share of investment—than the gain-sharing arrangement at Apple.

Gilead Sciences, as can be seen in Table 1, has the highest average employee pay, $384,000, of the 25 companies with the highest total value added. And although pre-tax value added per employee, at $88,000, is very high, its small employee population of 13,000 limits its aggregate employee value added to $800 million, or barely a tenth of UPS's $7.5 billion.

Gilead's patents have made it a very profitable company, with EVA more than three times its capital charge. And with such a large EVA, we shouldn't be surprised that Gilead employees account for only 6% of the company's total value added. But as we saw with Apple, our finding that Gilead employees account for 45% of the company's total opportunity costs suggests that the company's managers and directors feel that Gilead can attract and retain talented people without an equity-like sharing of the total gains.

The Cases of Costco and Walmart: Equity-Like vs. Fixed-Income Gain-Sharing

Walmart and Costco provide an interesting contrast of employee pay strategies within the same industry. Although average employee market pay, as would be expected, is the same for both companies—at $43,000—Costco pays much more, with average employee pay of $74,000 vs. Walmart's $39,000 giving Costco pre-tax value added per employee of $31,000 vs. a *negative* $4,000 at Walmart.

Costco is also much more profitable for investors, at least on a *scale-adjusted* basis. Whereas Costco's EVA of $3.6 billion amounts to 210% of its opportunity cost, or capital charge, Walmart's EVA of $5.3 billion is only 49% of its capital costs. In these labor-intensive enterprises, employees account for similar percentages of total opportunity cost, 83% at Costco and 87% at Walmart. But Costco is much closer to an equity-like partnership, where employees receive 63% of the company's total value added. In the case of Walmart, however, because employee value added is negative and investor value added is positive, employees effectively have no share of the company's total value added. And this has been pretty much the case for the past 25 years, during which time total value added at Walmart has averaged $7.4 billion per year while employee value added has averaged a negative $2.0 billion a year.[6]

As noted above, business partnerships often make their partners' share of income equal to their share of investment. And in drawing this partnership analogy earlier, we viewed employees' share of total opportunity costs—that is, total after-tax wages and benefits as a percentage of the sum of total after-tax wages and benefits and corporate capital charges—as a crude indicator of their implied share of investment. But how common are these sharing arrangements?

By plotting employees' share of value added against their share of opportunity cost for our top 25 value-adding companies, we get the snapshot of the prevalence of equity-like partnership shown in Figure 3. To the extent companies can be described as having completely equity-like partnerships, their employee shares of opportunity cost would explain 100% of the variation in their employee shares of total value added. And in the unlikely event we found such ownership to be universal, all companies would fall on the main diagonal where the two shares are equal.

But as shown in Figure 3, employees' share of opportunity cost explains only about 16% of the variation in their share of total value added. And the employee share of value added is less than 75% of the employee share of opportunity cost for all but four companies: UPS, Costco, CVS, and Cigna. What's more, when we look at S&P 1500 companies with positive EVA across all years, the statistical "fit" of the relationship drops to the point where the r-squared is 0%.

And although the employee share of value added is much less than the employee share of opportunity cost at Apple and Gilead Sciences, Figure 3 shows that both companies—are close to the "trendline" that reflects the most common practice.[7] Thus, companies like Costco and UPS appear to

6 Walmart's negative employee value can also be seen as boosting its investor value added at Walmart by about 20%. With average total value added of $7.4 billion per year, negative employee value added of -$2.0 billion raises investor value added to $9.4 billion per year, an increase of 22%.

7 The dashed line is the regression trendline. The solid line is the main diagonal where the two shares are equal.

Figure 4
Investor and Employee Value Added

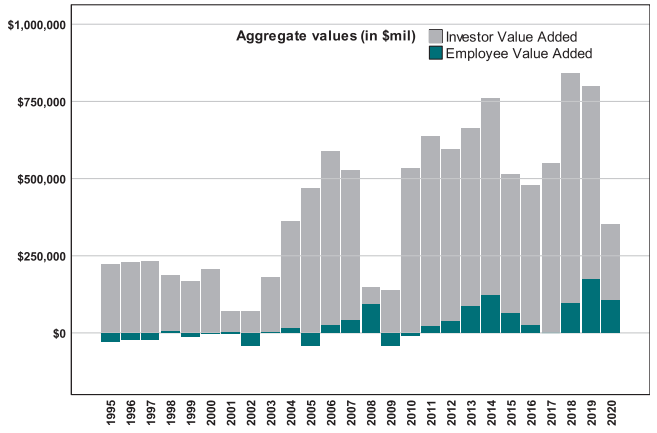
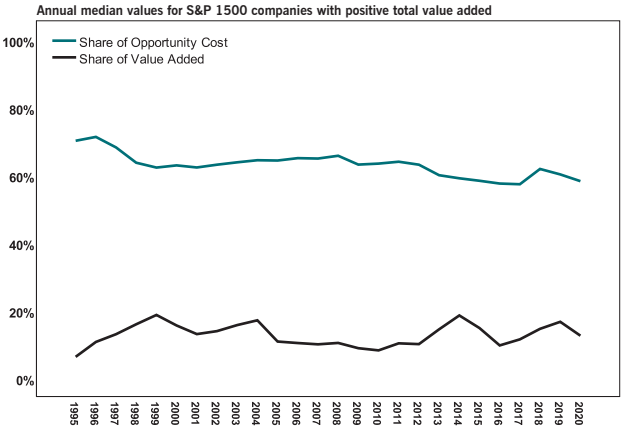


Figure 5
Employee Shares of Value Added and Opportunity Cost



be clear outliers, well above the trendline, in the equity-like features of their labor-capital partnership.

To help shed light on this puzzle, it's useful to note that during the 25-year period 1995-2020, there has been a notable increase in aggregate employee value added, rising from the negative values in the late 1990s—shown in Figure 4—to over $100 billion in each of the last three years. Moreover, the employee share of value added at the median company—as shown in Figure 5—has held relatively steady, even as the employee share of opportunity cost has declined modestly.

Assessing Labor-Capital Alignment, or Gain-Sharing, at Specific Companies

To get a better understanding of the alignment of labor and capital value added, it's useful to measure alignment for individual companies. But before we do so, let's explain why we focus on alignment of value added instead of other measures of success, such as gross income. Employee compensation plans in shareholder-controlled companies have long had three basic objectives: (1) providing strong incentives to increase company value; (2) retaining key talent; and (3) limiting the cost of compensation. By contrast, investor compensation in worker-owned or controlled enterprises, such as worker cooperatives, has long had one basic objective: providing enough of a return to persuade investors to commit capital to the firm. But if shareholder-owned companies aim to maximize shareholder wealth, while worker cooperatives seek to maximize employee wealth, both capital and labor must be sufficiently generous to attract the participation—and, ideally, the commitment—of the other.

Attracting the participation of the other party generally requires offering compensation that at least matches the party's opportunity cost. For reasons that are fairly easy to demonstrate, a labor-capital partnership that relies on fixed sharing of the gross profit calculated before (and without any consideration of) compensation expense is likely to fail to gain or maintain the participation of either labor or capital.[8]

With the aim of evaluating the extent of labor-capital alignment at specific companies, we began by calculating rates of return—one for each year over a ten-year period—for each of our three main measures of corporate performance: employee value added, investor value added, and (the sum of the first two) total value added. For each of the three cases, we calculate the return using the relevant opportunity cost in the first year of the ten-year period.[9] This exercise in turn produced three measures of alignment—between employee and total value added, between investor and total value added, and between employee and investor value added.

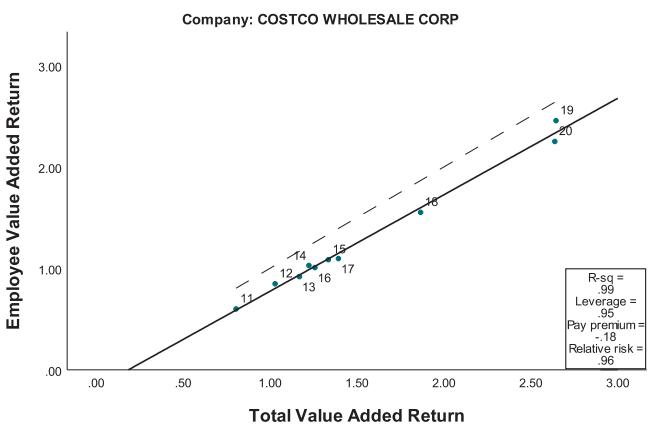
For the cases of Costco and Walmart, we use Figures 6 and 7 to illustrate four important features of employee pay and its relationship to investor and total value added that are captured in our analysis. The slope of the regression trendline shows the sensitivity, or "leverage," of employee value added to total value added. The r-squared is a standardized measure of alignment that varies from zero, or no correlation, to 1.0,

8 To see why, suppose a company starts with a 50%-50% gross revenue split but opportunity cost shifts to 70% labor, 30% capital. If gross revenue is 115, labor gets 57.50, 12.50 below its opportunity cost, and capital gets 57.5. With a 50%-50% value added split and 100 of total opportunity cost, labor gets 77.50, 7.50 above its opportunity cost, and capital gets 37.50.

9 The value added measure for any year reflects a deduction for that year's opportunity cost. For example, year 5 employee value added is after-tax year 5 pay minus after-tax year 5 market pay. It's just the return measure that uses year 1 after-tax market pay as the divisor. Measuring return relative to beginning opportunity cost adjusts for size differences between companies without disguising value added growth at high growth companies.

Figure 6

Employee vs. Total Value Added Return



Solid line is company trendline. Dashed line is leverage = 1.0 with pay premium of zero

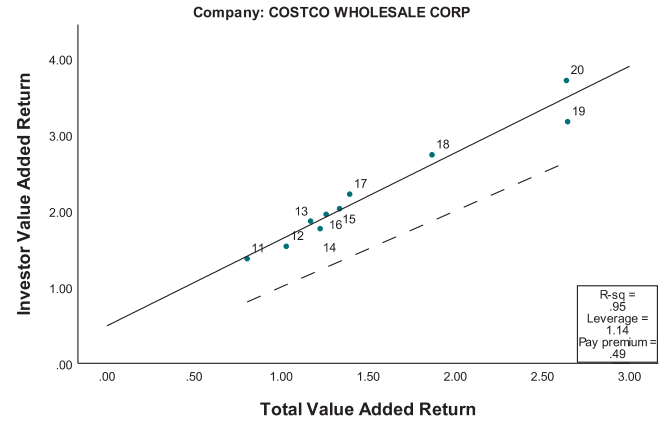
Figure 7

Employee vs. Total Value Added Return

Solid line is company trendline. Dashed line is leverage = 1.0 with pay premium of zero

Figure 8

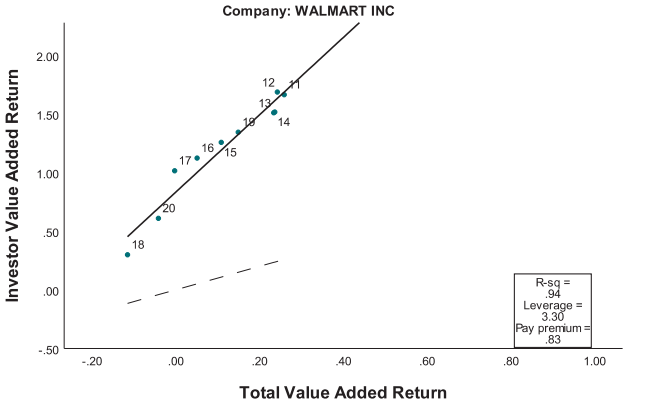
Investor vs. Total Value Added Return



Solid line is company trendline. Dashed line is leverage = 1.0 with pay premium of zero

Figure 9

Investor vs. Total Value Added Return



Solid line is company trendline. Dashed line is leverage = 1.0 with pay premium of zero

or perfect correlation. The intercept of the regression trendline gives us a measure of performance-adjusted cost that we call the "pay premium at zero total value added." The last measure, relative risk, is calculated as the ratio of the slope to the correlation, and shows the *variability* of employee value added in relation to the variability of total value added.[10] Viewing the Walmart and Costco graphs side by side, it's easy to see that employee value added is much more sensitive to total value added at Costco than at Walmart. Our finding can be interpreted as saying that each 1% increase in total value added return increases employee value added by twice as much at Costco (0.95%) as at Walmart (0.46%). Pay leverage is the product of correlation, or alignment, and relative risk—and both dimensions contribute to Costco's higher pay leverage. But Costco's alignment is only 8% higher than Walmart's, so the big difference in pay leverage comes mainly from Costco's higher employee pay risk, 0.96 vs. 0.50 for Walmart.

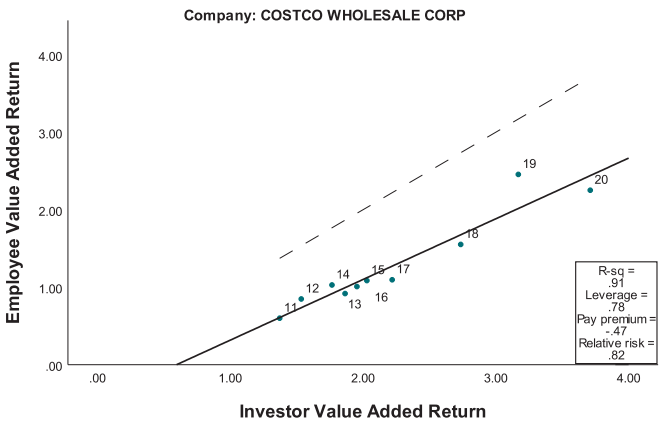
Walmart's low pay leverage and relative risk measures, as we come back to later, are generally reliable indicators of the extent to which a company's employees are viewed and treated as fixed-income as opposed to equity-like partners in the enterprise.

But now let's turn to the question of the alignment of *investor* value added, or EVA, with total value added. In Figures 8

10 Leverage, as a single regression coefficient, is equal to correlation x dependent variable standard deviation/independent variable standard deviation. Dividing leverage by correlation gives dependent variable standard deviation/independent variable standard deviation, our measure of relative risk.

Figure 10

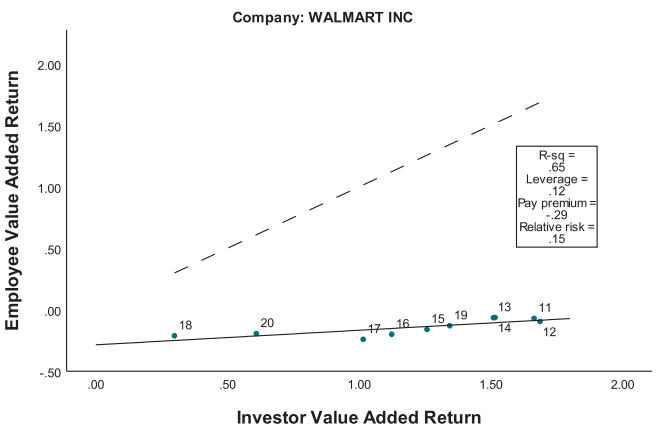
Employee vs. Investor Value Added Return



Solid line is company trendline. Dashed line is leverage = 1.0 with pay premium of zero

Figure 11

Employee vs. Investor Value Added Return



Solid line is company trendline. Dashed line is leverage = 1.0 with pay premium of zero

and 9, we show that Walmart, with its employee value added leverage of only 0.46, has investor value added leverage of 3.30. By contrast, Costco, with employee value added leverage of 0.95, has investor value added leverage of only 1.14.[11]

And this brings us to the question of the alignment of employee value added with investor value added: What relationship do we expect to find, and what do we learn from the cases of Costco and Walmart? In theory at least, we would expect to see a much clearer picture of labor-capital alignment. And as shown in Figures 10 and 11, the contrast between Costco and Walmart is quite striking. The sensitivity of employee to investor value added is six times greater at Costco than at Walmart. Our findings can be viewed as telling us that each 1% increase in investor value added return increases employee value added return by 0.78% at Costco, but by only 0.12% at Walmart. But our analysis also shows that Costco's higher employee pay leverage is attributable mostly to its larger relative pay risk, but only in small part to its higher alignment.

And consistent with all this, our findings of a lower pay "premium" at zero investor value added for Costco (-0.47 vs. -0.29) reinforce the suggestion that Costco's employees have a claim on their enterprise that looks much like equity, whereas the claims of Walmart's employees appear largely fixed, almost totally cushioned against risk.

But as effective and beneficial to its equity investors as this gain-sharing arrangement appears to be, Costco's degree of alignment of employee and investor value added and its relative pay risk are both highly unusual. Figure 12 shows the distribution of employee value added alignment for some 29,160 company-ten-year periods for S&P 1500 U.S. public companies as measured by their r-squareds during the period 1985-2020. As shown in the figure, Costco's r-squared of 0.91 puts it just shy of the 99th percentile. And as shown in Figure 13, which shows the distribution of relative pay risk for the same sample, Costco's relative risk falls a little short of the 95th percentile.

What Makes Costco Different?

There is a large literature on Costco's human resource strategy that highlights the company's high pay and benefit levels and management's commitment to employee satisfaction as drivers of employee productivity. What such studies have failed to identify are any policies, or pay mechanisms, that might be at work inside the company to keep employee value added rising more or less in tandem with investor value added. The company doesn't appear to make use of broad-based incentive plans that raise pay when investors' returns are high, and there is no discussion of target sharing in Costco's annual reports.

MIT professor Zeynep Ton, in her study of four "virtuous cycle" retailers—Costco, QuikTrip, Trader Joe's and Mercadona in Spain—reports finding that

11 And because the weighted averages of a company's employee value added leverage and investor value added leverage must, by construction add up to 1.0, the two are complements: when employee value added leverage is less than 1.0, investor value added leverage is greater than 1.0, and vice-versa. Employee value added (EmpVA) and investor value added (EVA) sum to total value added (TVA). Let MV denote aggregate after-tax market value and CC denote the capital charge. EmpVA + EVA = TVA implies that MV x EmpVA rtr + CC x EVA rtr = [MV + CC] x TVA rtr, so MV/[MV + CC] x EmpVA rtr + CC/[MV + CC] x EVA rtr = TVA rtr. If EVA rtr = β x TVA rtr and we assume TVA rtr = 1, we have MV/[MV + CC] x EmpVA rtr + CC/[MV + CC] x β = 1.

Figure 12

Employee Value Added Alignment with Investor Value Added (r-sq)

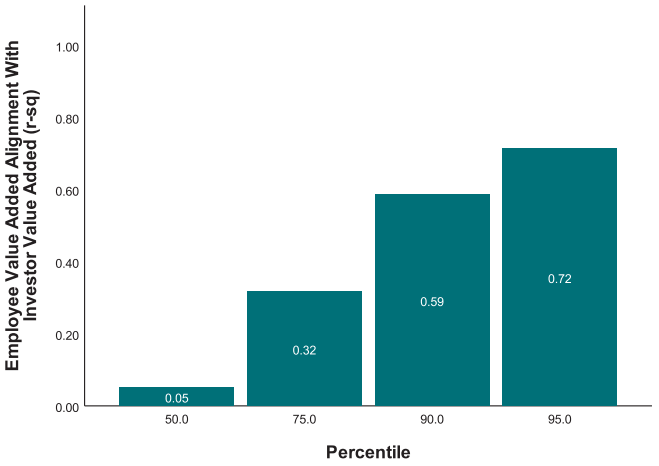
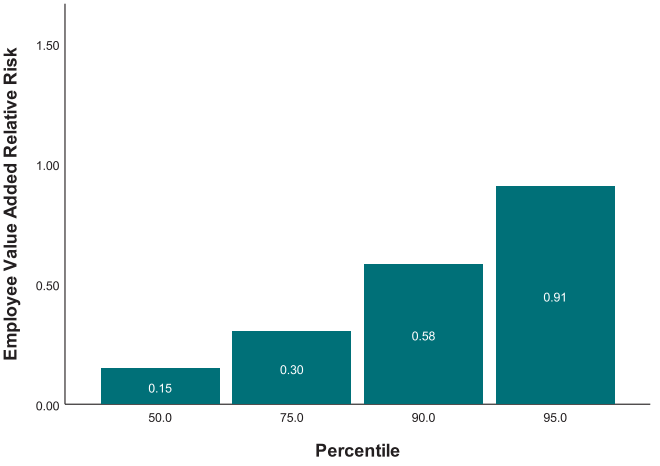


Figure 13

Employee Value Added Relative Risk



employees of these retailers have higher pay, fuller training, better benefits, and more convenient schedules than their counterparts at the competition. Store employees earn about 40% more at Costco than at its largest competitor, Walmart's Sam's Club.[12]

Supplying the rationale for that policy, Costco's CFO has said that

from day one, we have run the company with the philosophy that if we pay better than average, provide a salary people can live on, have a positive environment and good benefits, we'll be able to hire better people, they'll stay longer and be more efficient."[13]

And consistent with and reinforcing the above, Costco's 2020 10-K informs its investors—and indeed anyone who wants to know—that

with respect to the compensation of our employees, our philosophy is not to seek to minimize their wages and benefits. Rather we believe that achieving our longer-term objectives of reducing employee turnover and enhancing employee satisfaction requires maintaining compensation levels that are better than the industry average for much of our workforce.[14]

But high pay, in and of itself, doesn't provide high alignment of employee and investor value added. Such alignment requires policies or pay mechanisms of some kind that increase pay when EVA goes up. And Costco shows no sign of using broad-based incentives to tie employee pay to EVA. It provides stock compensation, but that is said to be a "meaningful portion of compensation" for only 5,000 of its 264,000 employees in 2020.[15]

One important pay mechanism appears to be the company's history of providing periodic increases in hourly rates. Costco raised its base wage from $13 to $14 per hour in 2018 and from $14 to $15 per hour in March 2019. In addition, it paid an additional $2 per hour to all employees for the first month of the COVID-19 pandemic.[16]

A second potentially important mechanism is its policy of paying above-market wages to employees when opening new stores. Much of Costco's growth in EVA has been attributed to growth in the number of stores. When new employees are hired to staff a new store and paid above market, that has the clear effect of increasing employee value added. And the contribution of new employees to employee value added increases rapidly in a store's first three years, thanks to a company practice of tying pay increases to experience that has the effect of doubling employee pay in the first three years.[17]

12 Ton, Zeynep (2012), "Some companies are investing in their workers and reaping healthy profits," *Harvard Business Review* (January-February), pp. 125-131.

13 Zimmerman, Ann (2004), "Costco's Dilemma: Be Kind to Its Workers, or Wall Street?," *Wall Street Journal*, March 26, 2004. See also Greenhouse, Steven (2005), "How Costco Became the Anti-Wal-Mart," *New York Times*, July 17, 2005.

14 Costco 2020 10-K, p. 22.

15 Vasudha, M. (2021), "Costco's Fair Wage Policy," Amity Research Centers case study, Bangalore, India, p. 4. Available at www.thecasecentre.org, case # 421-0013-1.

16 Vasudha, M. (2021), "Costco's Fair Wage Policy," Amity Research Centers case study, Bangalore, India, p. 2.

17 IBS Research Center (2009), "Costco's Employee Loyalty Strategies," p. 6. Avail-

But the very idea that Costco does not publicly disclose any gain-sharing targets or policies suggests the potential value of concepts like employee value added and our attempt to explore its relationship to EVA. Such an approach could prove helpful to corporate boards, and HR departments, in developing a quantitative methodology that captures the expected benefits (and costs) of Costco-like decision-making. Costco's public disclosures alone would have given us little reason to believe that Costco had achieved an extraordinarily high level of employee-investor value added alignment. And even if the results now appear to speak for themselves, we would all like to have a better understanding of how better-designed employee rewards lead to higher investor returns—and how employees themselves share in those gains.

The Effects of Pay Dimensions on Future Value Added

These huge differences between Costco and Walmart make it important to decide which, if any, of these different aspects of employee pay and value added can be shown to provide a competitive advantage for Costco. The goal of this last part of our study was to assess the extent to which certain pay dimensions or variables, when measured over ten-year periods, have consistently positive effects on the change in total or investor value added over the following three years.

What we found, after controlling for differences in beginning values and industry average changes in value added, were strong associations between higher pay and lower pay risk with increases in both total and investor value added. Our measures of alignment, by contrast, were notably less correlated with changes in value added.[18]

What these models of future EVA improvement appear to tell us is that, for most companies under normal circumstances, maintaining high levels of pay while ensuring low pay risk is likely to be the most cost-effective and reliable strategy for aligning the interests of labor and capital. Our models provide little if any support for attempts to increase the alignment labor and capital value added through equity-like gain-sharing schemes that impose greater risk on employees.

Conclusion

Our first aim in this article was to introduce a new way of measuring and understanding employee value added at public corporations, and the extent to which such value is consistent with and related to measures of investor value added like EVA. In so doing, and without relinquishing the doctrine of shareholder primacy, we effectively view the social value of public companies as captured by the sum of these two "flow" measures: employee value added and investor value added.

Our second goal is to encourage investors to demand greater, and possibly, universal disclosure of total compensation expense—information that, we would suggest, is essential to understanding companies, as even Karl Marx came to see them—namely, as partnerships of labor and capital.

Our third objective, broader yet, is to encourage directors and managers to think in terms of—and possibly even try to measure—the alignment of employee and investor interests within their own companies; and using such information as the launch point for discussion, to report their human capital strategy and investment designed to strengthen both their labor-capital alignment and the commitment of their employees to increasing the *total* value that ends up being shared by both groups.

Investors, to be sure, have long been convinced of the benefits of compensation that aligns management and capital value added. And our expectation is that the benefits of aligning labor and capital value added will become more apparent once companies begin to measure alignment and adopt pay plans with sharing formulas designed to ensure alignment. Some companies, when presented with this possibility, will continue to rely on ensuring competitive (or slightly higher) pay and limiting employees' pay risk to maintain their ongoing commitment, while limiting equity-like rewards to senior managers and employees. Nevertheless, the success of companies like Costco will encourage further experimentation in possibly more deliberate and strategic attempts to align employee and investor interests and rewards. In some of these cases, this experimentation may well even take the form of more explicit and formal gain-sharing contracts—those with the potential to turn the public corporation into a true partnership of labor and capital that even Adam Smith could not have foreseen.

able at www.thecasecentre.org, case #408-044-1.

18 Starting with our model of total value added, we find an expected three-year change in total value added equal to 32.4% of (beginning-year) opportunity cost for Walmart, but only 3.1% for Costco. Our analysis attributes 105% of this difference to Walmart's lower relative pay risk (50.1% vs. 95.5%) with minor offsets for Walmart's lower pay premium and lower alignment. The sum of the three contributions add up to 100%: 105% - 4% - 1%.

Our model of changes in investor value added predicts a three-year change in investor value added of 110% of beginning capital charge for Walmart, but -416% for Costco. 94% of the difference is attributable to Walmart's lower relative pay risk (14.8% vs. 82.2%), and 7% to Walmart's higher pay premium at zero investor value added (-29% vs. -47%). Walmart's lower alignment (80% vs. 95%) offsets 1% of the difference. The sum of the three contributions add up to 100%: 94% + 7% - 1%. The appendix provides more detail on our models of three-year changes in value added.

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Appendix

Estimating Average Employee Pay

The basic building blocks of employee value added are total employee pay and aggregate market pay, but few S&P 1500 companies report total employee pay and none report aggregate market pay. In this appendix, we explain how we estimate average employee pay for the companies that do not report total compensation expense and how we estimate market pay for all companies.

In 2020, 84% of S&P 1500 companies did not report total compensation expense. The ones that did were mainly in four industry groups: banks, diversified financial services, transportation, and consumer services. Fortunately, our data source, Standard & Poor's North American Compustat, includes 1,565 public companies—with 1,312 outside the S&P 1500—that did report total compensation expense in 2020. 781 of these companies are headquartered in the United States, 471 are headquartered in Canada, and 313 are headquartered elsewhere.

Including all history years (back to 1980), we have 49,390 company-years with reported total compensation expense and total employees, the data we need to calculate average pay per employee. Of these, 70% are headquartered in the United States, 12% in Canada and the rest outside North America. We use these 49,390 observations to develop models of average employee pay that we can apply to the 61,934 S&P 1500 company-years without reported total compensation expense and/or total employees. Due to the shift in disclosure that led to median pay reporting in 2017 and later years, we develop two sets of models: one set that incorporates the median pay data reported in 2017 and later years, and one set that does not require median pay data.

Our models of average employee pay have two steps. First, we develop models of ln (inflation adjusted average pay) as a function of several independent variables and, second, we develop a "Smearing[19] adjustment" model that we use to adjust predicted ln (inflation adjusted average pay) upward to ensure that predicted dollar pay is equal, in the aggregate, to actual dollar pay. For the models that don't use median pay data, the independent variables are the mean ln inflation adjusted average pay for the GICS industry group & year and six variables expressed as differences from the GICS industry group/year mean: ln inflation adjusted sales per employee, ln inflation adjusted market equity per employee and dummy variables for four geographic regions: South America, Europe, Africa, and Asia. For these models, we run separate models for each GICS industry group. For the models that do use median pay data, the independent variables in the model are the mean ln (inflation adjusted median pay) for the GICS industry group & year and two variables expressed as differences from the GICS industry group/year mean: ln inflation adjusted median pay and ln inflation adjusted sales per employee. For these models, we also run separate models for each GICS industry group. To increase the size of the industry group samples, and hopefully, the accuracy of the adjustment coefficients, we use the predicted value from the models without median pay data as the dependent variable when total compensation expense is not reported.

Our use of industry models should mitigate the distortions caused by total employment figures that include part-time employees and make no adjustment for overtime. Costco's 264,00 employees in Table 1 is the average of 273,000 employees at the end of 2020 and 254,000 employees at the end of 2019. Costco's employee totals include 117,000 part-time employees at the end of 2020 and 105,000 part-time employees at the end of 2019, so 58% of Costco's total employees are full time and 42% are part time. At Walmart, 70% of its employees in 2020 were in the United States and 64% of those were full time. It does not report the full-time percentage for its total employee population. Neither Costco nor Walmart reports average overtime hours.

Total compensation expense divided by total employees does not provide a perfectly accurate measure of full-time equivalent pay when some employees are part-time and other employees are working overtime. This is an area for further research. Since part time employment is much more common in a few industries such as retail, hospitality and entertainment and overtime practices may be industry related, it is our expectation that our use of industry models mitigates the biases caused by part-time employment and overtime hours.

The availability of median pay data significantly improves the accuracy of our models. The models without median pay explain 58% of the variation in ln inflation adjusted average pay across all cases, while the models with median pay explain 86% of the variation in ln inflation adjusted average pay across all cases with reported median pay. When we convert predicted ln pay back to dollars, the mean dollar predicted pay is 11% less than mean actual pay for the models without median pay and 6% less for the models with median pay. The Smearing adjustment uses a linear regression that expresses actual dollar pay as constant + multiplier x predicted dollar pay and then uses the constant and multiplier to adjust predicted dollar pay

19 Duan, Nathan (1983) "Smearing Estimate: A Nonparametric Retransformation Method", *Journal of the American Statistical Association*, Vol. 78, No. 383 (September) pp. 605-610. Duan writes that "the terminology 'smearing' was originally coined by C. Morris for the tactic of distributing (smearing) the excess in one observation to other observations proportionally when adjusting unlogged median estimates to unlogged mean estimates."

Figure 14
Market Pay Premiums by Industry

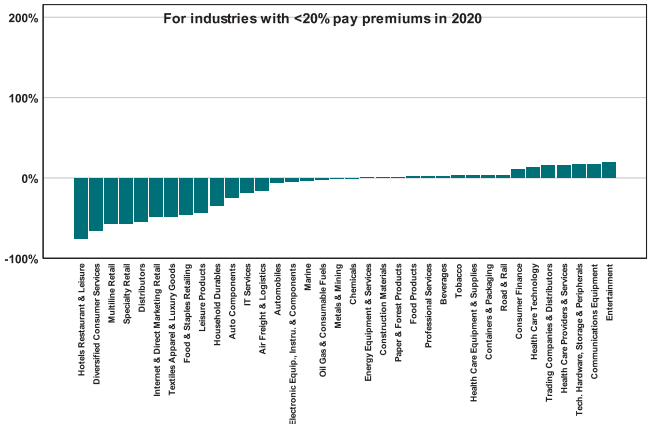
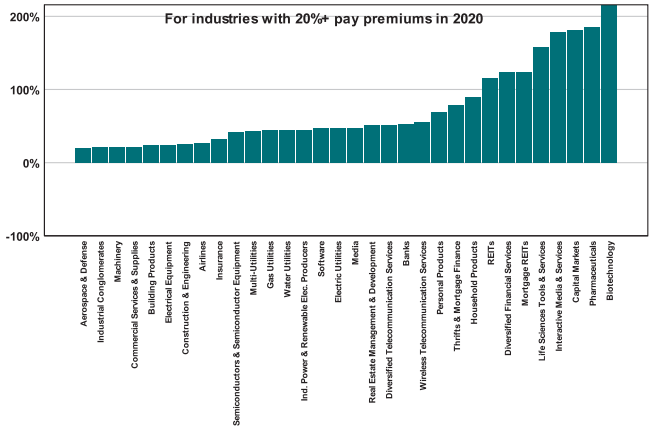


Figure 15
Market Pay Premiums by Industry



upward so the mean predicted dollar pay is equal to the mean actual dollar pay.

Estimating Average Market Pay

We estimate average inflation adjusted market pay for each industry and year in two steps. We start with the Bureau of Labor Statistics (BLS) National Compensation Survey data on Employer Costs of Employee Compensation. We use BLS employer cost data—rather than BLS wage survey data—because it includes the employee benefit costs that are included in annual report compensation expense. Average total compensation for all civilian workers in 2020 was $79,000, inflation adjusted to March 2021.

The second step is to estimate industry differentials relative to population weighted average pay. We do this using public company data, first calculating the employment-weighted average pay of all public companies for each year, then calculating the employment-weighted average pay of all public companies in each GICS industry, and finally, calculating the premium or discount of industry average pay to national average pay (see Figures 14 & 15). We apply these industry differentials, calculated from public company data in Compustat, to the BLS national average total compensation to get industry average market pay. Our calculations assume that pay differentials calculated from public company data are reasonable estimates of pay differentials in the national labor market.

The goal of our calculations is to compute average market pay for each company that is consistent with national average pay data. We want our market rates to be consistent with national average pay data so that our opportunity cost measure for employees will be consistent with our opportunity cost measure for investors. Opportunity cost for investors in a company is the expected return of the market portfolio adjusted for risk differences between the company and the market portfolio. The Capital Asset Pricing Model assumes that there is only one important risk difference, beta, which measures return sensitivity to the overall market. We use the Fama-French four-factor model which assumes that there are four important risk differences, i.e., sensitivity to the overall market, small size, high profitability, and low growth. The market portfolio reflects all available investments. To be consistent with cost of capital tied to the expected return of all available investments, we want a measure of employee opportunity cost that is tied to the pay of all available jobs. Just as cost of capital adjusts the expected return of all available investments for risk differences, we want an opportunity cost measure that adjusts the average pay of all available jobs for skill differences.

Figure 16 shows that national average total compensation from the BLS is quite similar to the mean pay of all public companies even though public companies only account for about 20% of total employment, as Figure 17 shows. Despite this similarity, our national average market rates may differ from the market rates a public company might use to set its own pay levels. For example, Microsoft might use a select group of competitors such as Oracle, Google, and Adobe to calculate market rates for software engineers. Microsoft's market rate for software engineers may be well above national average pay for software engineers because Microsoft wants to attract the most capable software engineers in the country. On the investment side, Microsoft will prioritize prospective investments based on their expected rate of return and will normally reach its

Figure 16
Public Company Auction vs. Market Pay

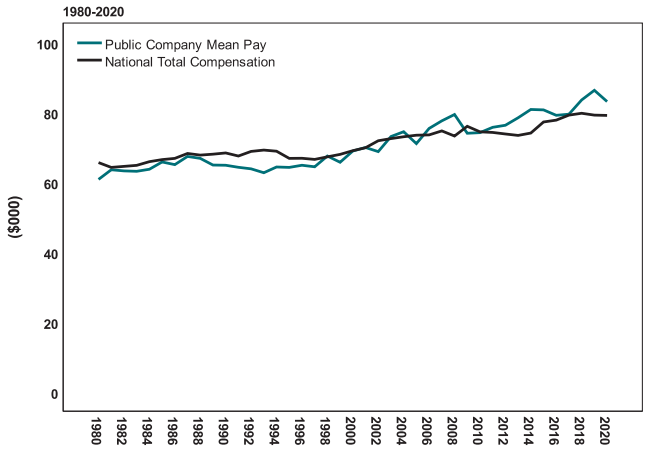
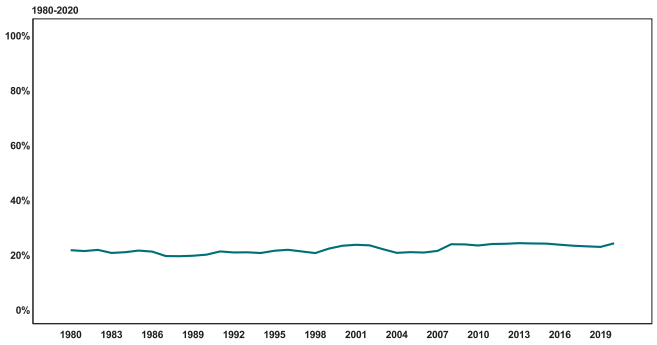


Figure 17
Public Company Employment Percentage of U.S. Total



investment constraint well before expected returns fall to its cost of capital. In theory, Microsoft should continue to invest until its marginal expected return falls to its cost of capital, but, in practice, available management time will be exhausted well before it reaches that point.

If sufficient data were available, we would use a "bottoms-up" methodology to calculate company average market pay. We would calculate national average market pay for each job in the company and then calculate the employment-weighted average of all the individual job market rates. After similar calculations for each company in the industry, we could calculate each company's pay premium and the industry average pay premium. Since "bottoms-up" pricing is the universal norm in human resources departments and HR staff may be surprised that we would even attempt "top-down" pricing, it's worthwhile to point out that, under certain conditions, "top-down" pricing could exactly match "bottoms-up" pricing. If we started with the aggregate market payroll for the industry, we could get back to the individual job market rates as long as we knew each job's share of the aggregate market payroll, and we could get back to aggregate market pay for each company as long as (1) we knew each company's total employment (which we do know) and (2) all companies divide up the market payroll in the same way (that is, any given job accounts for the same percentage of the market payroll across all companies) so that the market payroll is exactly proportional to total employment.

Calculating NOPAT, Capital, and EVA

Our measure of investor value added, EVA, is equal to Net Operating Profit After Tax (NOPAT) minus a capital charge. The capital charge is equal to the weighted average cost of capital (WACC) multiplied by EVA book capital at the start of the year. Our cost of capital calculation is explained in the next section of this appendix. The goal of EVA is to provide an economic (vs. accounting) measure of investor (vs. shareholder) profitability. The goal of measuring economic (vs. accounting) profit is to provide a better measure of current period operating profitability by correcting for accounting conservatism. We make five adjustments to correct for accounting conservatism. We capitalize R&D, advertising, and special items, all after-tax, and amortize them over future periods, 5 years for R&D and special items, and 3 years for advertising.[20] Companies expect R&D and advertising to benefit future periods but GAAP does not capitalize them due to uncertainty about the true asset value. Many special items, e.g., restructuring charges, are also expected to benefit future periods. We capitalize all special items because there isn't sufficient disclosure in Compustat to distinguish different types of special items. Our fourth adjustment to correct for accounting conservatism is to add back amortization of intangible assets (such as trademarks and customer lists). These assets are typically a carve-out from goodwill and, like goodwill, don't decline in value in an ongoing business. Our fifth adjustment is to charge NOPAT with pension current service cost and capitalize the other elements of GAAP pension expense including prior service cost, interest on the unfunded pension obligation and unexpected gains & losses on pension assets The goal of measuring investor (vs. shareholder) profitability is to capture the profitability of the underlying business without regard to its capital structure. To capture investor prof-

20 For pharmaceuticals and bio-tech (GICS 3520), we use 10 years for R&D and 5 years for advertising.

itability, we add back after-tax interest expense to net income to calculate the earnings available to provide a return to both debt and equity investors. The income tax expense in NOPAT is income tax on operating income, i.e., actual income tax expense plus the tax savings from interest expense.

EVA capital is equal to net assets, i.e., total assets minus non-interest bearing current liabilities, deferred taxes and short-term investments, plus capitalized R&D, advertising, special items, amortization and pension costs.

For UPS and Gilead Sciences, our NOPAT adjustments make NOPAT significantly higher than net income plus after-tax interest expense. UPS's NOPAT of $11.0 billion in 2020 is $9.1 billion more than its net income plus after-tax interest expense. The major difference is pension expense. NOPAT reflects the pension current service cost, $1.9 billion, while net income also reflects past service cost, interest cost, and shortfalls vs. the expected return on pension plan assets, bringing net income pension expense up to $9.6 billion. Capitalized pension expense adds $49.7 billion to UPS's capital of $106 billion, making its capital much greater than its net assets of $46 billion. Capitalized special items (+$0.8 billion, net of amortization), amortization of intangibles (+0.4 billion), and implicit interest in lease expense and SG&A for other long-term liabilities (+0.2 billion) account for the remainder of the $9.1 billion difference. Gilead Science's NOPAT of $15.9 billion in 2020 is $15.0 billion more than its net income plus after-tax interest expense. The difference is due to capitalizing R&D (+$8.6 billion), advertising (+$0.4 billion) and special items (+$4.8 billion), and adding back amortization of intangibles (+$1.2 billion). Gilead's capital of $68 billion includes capitalized R&D of $17 billion and capitalized intangibles amortization of $6 billion, making its capital much greater than its net assets of $41 billion.

Estimating Investors' Cost of Capital

We use the four-factor Fama-French model to estimate investors' opportunity cost.[21] The four risk factors in the model are (1) exposure to the market return in excess of the risk-free rate, (2) small size, (3) high profitability and (4) low asset growth. The risk-free rate used in the model is the one month Treasury bill rate. Each of the four risk factors is represented by a portfolio and a company's risk exposures are captured by the company's excess return sensitivities to the four portfolios. The four risk factor portfolios are referred to as MXR (the market portfolio return minus the risk-free rate), SMB (a small stock portfolio return minus a big stock portfolio return), RMW (a robust profitability portfolio return minus a weak profitability portfolio return) and CMA (a conservative asset growth portfolio return minus an aggressive asset growth portfolio). The risk exposures are represented by "factor betas" that represent the coefficients of the four risk factor portfolios in a multiple regression using sixty months of returns where the dependent variable is the company's monthly return in excess of the risk-free rate and the independent variables are the returns of the four risk factor portfolios. To determine each company's expected cost of equity at its fiscal year end, we use the company's four risk factor betas (measured for the 60 months ending in the fiscal year end month), the expected returns for the four risk factors and the risk-free rate. Expected return = one month risk-free rate + MXR beta x expected MXR return + SMB beta x expected SMB return + RMW beta x expected RMW return + CMA beta x expected CMA return. The risk factor betas are adjusted for expected mean reversion. The expected return for each portfolio is equal to the portfolio's annualized average return since 1963, the first year of the Fama-French data. At the end of 2020, the expected returns were 6.7% for MXR, 3.0% for SMB, 3.0% for RMW and 3.2% for CMA. We use each company's expected equity return and its cost of debt to calculate its weighted average cost of capital (WACC). Prior year end WACC x beginning of year book capital is the capital charge used in the EVA calculation.

The median Fama-French cost of equity is similar to the median cost of equity under the one risk factor Capital Asset Pricing Model (CAPM) but the Fama-French cost of equity has greater variability. For 2020, the median Fama-French cost of equity for S&P 1500 companies was 9.5% vs. 9.2% for the CAPM, but the Fama-French mean and standard deviation were considerably higher. The mean Fama-French cost of equity was 10.8% vs. 9.4% for the CAPM and the Fama-French standard deviation was 6.0% vs. 1.6% for the CAPM. The WACC shows similar relationships. The median Fama-French WACC for S&P 1500 companies was 7.1% vs. 7.3% for the CAPM WACC. The mean Fama-French WACC was 8.0% vs. 7.3% for the CAPM and the Fama-French standard deviation was 3.2% vs. 1.5% for the CAPM.

The mean real annual equity return since 1870 is approximately 8% and 8% is often used as a norm for expected equity returns. To avoid costs of capital that appear to be exceptionally low relative to this norm, we use 5% as a minimum cost of capital for both the Fama-French and the CAPM models. Across all history years, this affects 36% of our Fama-French WACC estimates and 15% of our CAPM WACC estimates.

When we compute alignment and other pay dimensions using ten years of historical EVA returns, we assume the same

21 See Fama, Eugene F. and Kenneth R. French, A Five Factor (2015) "A five factor asset pricing model," *Journal of Financial Economics* Vol 116 1-22. We don't use one of the five factors, the HML (high book to market minus low book to market) factor because it doesn't add any explanatory power. "The five factor model never improves the description of average returns from the four factor model that drops HML." (p. 12).

Table 2

Explanatory Variables:	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	0.000	0.024		0.000	1.000
Ind/Yr Mean 3 Yr Chg in Total Value Added/Opportunity Cost[-12]	1.000	0.018	0.311	55.116	0.000
Dif from Ind/Yr Mean Total Value Added Return[-3]	0.037	0.007	0.030	5.213	0.000
Dif from Ind/Yr Mean Employee Pay Premium at Zero Total Value Added[-3]	0.577	0.060	0.055	9.668	0.000
Dif from Ind/Yr Mean Employee Pay Relative Risk (vs Total Value Added Rtr)[-3]	-0.675	0.064	-0.060	-10.485	0.000
Dif from Ind/Yr Mean Employee - Total Value Added Rtr Alignment[-3]	0.045	0.060	0.004	0.747	0.455
Dependent Variable: 3 Yr Chg in Total Value Added/Opportunity Cost[-12]					

Table 3

Explanatory Variables:	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	0.000	0.087		0.000	1.000
Ind/Yr Mean 3 Yr Chg in Investor Value Added/[Capital Charge[-12]	1.000	0.021	0.269	47.080	0.000
Dif from Ind/Yr Mean Investor Value Added Return[-3]	-0.048	0.006	-0.045	-7.756	0.000
Dif from Ind/Yr Mean Employee Pay Premium at Zero Investor Value Added[-3]	0.627	0.181	0.020	3.459	0.001
Dif from Ind/Yr Mean Employee Pay Relative Risk (vs Investor Value Added Rtr)[-3]	-2.108	0.310	-0.040	-6.806	0.000
Dif from Ind/Yr Mean Employee - Investor Value Added Rtr Alignment[-3]	0.130	0.186	0.004	0.700	0.484
Dependent Variable: 3 Yr Chg in Investor Value Added/Opportunity Cost[-12]					

weighted average cost of capital for all ten history years (equal to the weighted average in the final year). Our rationale for this assumption is to limit the negative impact of a factor beyond management control, i.e., changing cost of capital.

Our Regressions on Future Change in Value Added

Our pay dimensions are calculated from returns on opportunity cost in the first year of each ten-year period. To provide a consistent measure of future change in total value added, we standardize the future three-year change in total value added by the same opportunity cost we use in computing the pay dimensions, i.e., opportunity cost at the start of the ten-year period preceding the three-year change in total value added. This means that the three-year change is standardized by opportunity cost 12 years prior to the final year of the three-year change.

To control for industry, we compute industry/year means for the dependent variable and each independent variable, and then use the mean industry change as our first explanatory variable and express our other explanatory variables as differences from the industry/year mean. To ensure that pay dimension effects are not just correlations with total value added at the start of the three-year period, we use total value added at the start of the three-year change period as additional explanatory variable.[22] Table 2 shows the regression coefficients. The employee value added premium at zero total value added has a large and statistically significant positive effect on the future change in total value added, and relative pay risk has a large and statistically significant negative effect on the future change investor value added. Employee value added alignment has a positive effect, but is far from statistical significance at conventional levels.

Let's now look at the parallel regression where we use the future change in investor value added as the dependent variable. Table 3 shows the regression coefficients. The employee value added premium at zero investor value added has a large and statistically significant positive effect on the future change in investor value added, and relative pay risk has a large and statistically significant negative effect on the future change in investor value added. Employee value added alignment has a positive effect, but is far from statistical significance at conventional levels.

22 This variable is also expressed as a difference from the industry/year mean.

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