Measuring the Distribution of Returns Among Stakeholders: Method and Application to US and Japanese Auto Companies

by

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I. Introduction

Standard measures of corporate performance focus on returns to shareholders: historical performance is denoted by returns on assets or equity, while stock prices reflect the anticipation of such returns in the future. Researchers in strategic management have generally taken these shareholder returns as the appropriate measures of corporate performance to be maximized. But the field of strategic management has also viewed the business corporation more broadly as a vehicle for value creation. The value created by the firm is distributed not only to its shareholders, but also to other stakeholders, including managers, workers, and customers.[1] Long term success requires that this broader set of stakeholders receive some portion of the value created by the firm. Indeed, in Japan and other countries, employees are often considered more important than equity owners within the hierarchy of company stakeholders.[2]

Most research to date on the stakeholder perspective has been conceptual; there have been very few attempts to make empirical assessments.[3] This paper presents a simple methodology for estimating the total value created by a company and the distribution of this value among the firm's major stakeholders. We show, moreover, that public data obtained from corporate financial reports can often serve as the basis for these computations.[4] We illustrate the methodology in an international context with a comparison of US and Japanese automotive companies. Our computations show major differences in value creation and its distribution between American and

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[1] This broader view of corporate stakeholders has been a growing theme in the management literature. Recent contributions and surveys include Blair (1995), Donaldson (1995), Hill (1992) and Jones (1995).
[2] Clark (1979), Itami (1987).
[3] One exception is Chakravarthy (1986).
[4] Our methodology is an extension of existing concepts of value-added accounting. See, for example, McKeay (1983) and Purdy (1983).

Japanese firms, as well as between highly-successful and less-successful producers within each country.

The presentation is in two main parts. First, we describe how a firm's value creation, and its distribution among stakeholders, can be measured at a given point in time. We show, moreover, that value creation is closely related to the concept of productivity. The second part of the paper describes how gains can be measured over time. This allows a computation of the benefits flowing to consumers. The paper concludes with a discussion of factors that affect the power of various stakeholders to appropriate the value created by the firm.

II. Measuring Corporate Value and Its Distribution at a Specific Point in Time

The basis for our analysis is the firm's "value-added" during a given period of time. Value-added is defined as the difference between the firm's sales revenue and its total cost of purchased materials, energy, and services. Thus, value-added is the revenue contribution attributable to labor and capital within the firm. Value-added corresponds directly with the incomes of the various stakeholders in the corporation. It can be most easily computed by summing up the components of the firm's revenue which are distributed to labor and capital, plus the portion captured by government in the form of tax collections:

Value-added = labor compensation + returns to capital + tax payments (to government);

where

Labor compensation = wages + salaries + bonuses + benefits;
Returns to capital = depreciation + net income after taxes;
Tax payments = income taxes + payroll taxes + property taxes + misc. taxes.

Figure 1 illustrates how General Motors in 1985, a year in which the company reported an unusually detailed breakdown of its expenses, distributed its value-added among the categories of stakeholders mentioned above. The Figure shows that in 1985, GM had total revenue per worker of roughly $100,000. Of this total, about half was "value-added"; a tiny fraction was

"other income,"[5] and the remainder was paid out by the firm for materials, energy, and various services provided by outside vendors. Of GM's value-added component, about two-thirds was paid to labor; the balance went for equipment depreciation, taxes, and the firm's net income.

Value-added is a measure of gross value creation, and its magnitude can be compared across companies. But such comparisons are not particularly meaningful, as differences in company size and vertical integration are the primary determinants of differences in corporate value-added. For more insightful comparisons, some form of ratio analysis is required.[6] In the automotive industry one seemingly-attractive ratio is value-added per vehicle produced. Unfortunately, inter-firm differences in average vehicle size, quality characteristics, and vertical integration make the interpretation of this ratio problematic. An alternative ratio, value-added per employee, is the benchmark which we apply in this study. Value-added per employee, which is equivalent to labor productivity, has a number of salient features: (1) it can be applied to any company regardless of industry; (2) it provides a direct measure of firm efficiency; and (3) national wealth creation (income per capita) is directly linked to labor productivity. Thus, unlike corporate profits, growth in value-added per employee represents an unambiguous contribution to national economic welfare.

Comparison of Automotive Companies

The firms in our sample are: Toyota, Nissan, and the "big three" US auto producers. We first consider how value-added was distributed in each of these companies in 1978 and 1988. Then, in Section III, we examine how the gains in productivity over the period from 1978 to 1988 were distributed. We have chosen the years 1978 and 1988, as both were near peaks in automobile sales, which allows cyclical effects on productivity to be largely disregarded.

Figure 2 gives labor productivity (measured as value-added per worker, in US dollars, based on the prevailing market exchange rate of 210 yen per dollar) for each of the six companies in 1978.

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[5] For the American firms in our sample, we have defined "other income" to consist of interest and dividend income, net of interest expense. By netting out interest expense, we have minimized the size of "other income" and simplified our analysis by eliminating consideration of creditors as a claimant on value-added. Analysis of non-automotive companies, in which financial income does not completely offset interest expense, might include debt-holders in the analysis.

[6] Ratios are also required for meaningful profit comparisons, e.g., return on sales, return on assets, return on equity.

The Figure allows inter-firm comparisons of total value-added per worker as well as the distribution of this revenue among stakeholders.

Figure 2 shows that there was substantial productivity variation among the automakers in 1978. Toyota had the highest labor productivity and Chrysler the lowest. Indeed, Chrysler was on the verge of bankruptcy in the late 1970s; virtually all the company's revenue was paid out to labor, leaving nothing as a return to capital. Returns to capital, which are correlated with productivity, varied dramatically among the companies. In 1978, average compensation per worker was higher in the US than in Japan.

Figure 3 shows value-added per employee for the five automakers one decade later, in 1988. The Figure suggests that Japanese producers had higher labor productivity than US companies in that year. However, this is mainly due to the very high productivity of Toyota which remains an outlier among the Japanese producers. Indeed, the data in Figures 2 and 3 show that the productivity variation among firms within each country was large.[7]

Figure 3 shows that the difference in labor compensation between the US and Japan had virtually disappeared by 1988. In that year the average compensation per worker was very similar for all five firms. However, the proportion of value-added distributed to labor varied greatly among the companies.

While the returns to labor were similar in the five companies in 1988, the returns to capital were not. To determine whether firms were creating "excess" value (or "economic rents") for their shareholders, each company's cost of capital must be subtracted from the returns to capital shown in Figures 2 and 3. Such calculations of "economic value added" (EVA) are beyond the scope of this paper.[8] But rough computations show that Toyota earned returns vastly in excess of its capital costs, whereas the other firms earned slightly more than their costs of capital in 1988, which was generally a good year for automakers.

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[7] The comparison between US and Japanese companies depends in part on the assumed exchange rate. In Figures 2 and 3 we have used the prevailing market exchange rate, but an alternative choice would be a "purchasing power parity" rate, which attempts to equalize the prices of specific goods (automobiles) in the two countries.

[8] The methodology for computing "economic value added" is described in Tully (1993).

Figures 2 and 3 also show the distribution of value captured by the government in the form of taxes. As expected, these tax collections are strongly correlated with the returns to capital. Toyota, with its disproportionately large net income, paid by far the most taxes per employee.

III. Measuring Gains Over Time

The previous section described how to assess a firm's value-added and its distribution among stakeholders in a given year. In this section we consider the growth of value-added over time. The specific example focuses on changes in the five auto makers' value-added over the period, 1978-88.

As labor productivity rises (hopefully) over time, value-added per worker grows, increasing the potential income available to the stakeholders, as considered in the previous section. There is, however, a complication: the "real" price of the product may fall; thereby transferring some or all of the productivity gain to consumers. Accordingly, we include estimates of consumer benefits in our estimates of the distribution of productivity gains over time.

To compare value-added over time it is necessary to select appropriate price deflators. Two different measures of price change are relevant. The first is the price of the firm's output---in this case, motor vehicles. Each firm's nominal value-added, measured in current dollars, must be discounted to reflect changes in motor vehicle prices. The second inflation measure is the average economy-wide increase in prices, as measured by the consumer price index, or more generally, the GDP (gross domestic product) deflator. Such a deflator adjusts for changes in the buying power of a given amount of currency. The real incomes of workers, shareholders and the government are directly tied to this inflation measure, holding nominal quantities fixed.

The difference between the economy-wide measure of inflation, and the inflation measure relevant to company output, provides a measure of consumer gains.[9] A firm or industry that cuts prices rapidly (or raises its prices more slowly than other sectors of the economy) delivers increased value to consumers. Consider, for example, the case of an economy with zero inflation, excluding the price of automobiles. A car of given quality initially costs $10,000. If auto prices fall by 10%, consumers enjoy a gain: for the same dollar expenditure they can buy a higher-performance vehicle, or they can buy the same car and spend the $1000 savings on other goods.

As an alternate example, assume that auto companies collude and raise their prices by 10% relative to any price change for the economy as a whole. In this case, consumers suffer welfare losses---they must give up 10% more of their real income to purchase a car. These consumer losses flow as gains to shareholders of the auto companies, who now enjoy greater returns in the form of higher profits.[10] Employees may be able to capture some part of these gains if labor compensation is linked to firm profitability (e.g, management bonuses and stock options), or if labor unions exert power.

A Specific Example

Table 1 shows how the growth in value-added and its distribution among stakeholders can be computed, using the Ford Motor Company between 1978 and 1988 as an example. The years 1978 and 1988 represent comparable points in the automotive business cycle. By comparing values in these two benchmark years, we can obtain reasonable measures of changes over time.

Using the Producer Price Index for motor vehicles, we estimate that in the absence of any productivity gains, Ford's nominal value-added per worker would have risen by 61.6% over the decade. It is the increase in value-added per employee beyond this purely inflationary effect which

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[9] This measure is an approximation of the consumer's surplus concept described in the economics literature. See, for example, Willig (1976) and Weitzman (1988).

[10] While most of the consumer loss flows as a gain to shareholders, there is also a "deadweight loss" of welfare from consumers who choose not to buy a car at the higher prices. Such deadweight losses or "welfare triangles" are ignored in the current analysis. Also, part of the transfer from consumers is captured by government in the form of corporate income taxes.

represents Ford's gain in productivity, or value creation. According to our calculations, this real productivity gain was roughly $28,200, measured in 1988 dollars.

To see how much incomes at Ford increased, we applied the GDP price deflator, a measure of overall inflation in the economy. The general level of prices in the US, as indicated by this index, rose 72% between 1978 and 1988 (i.e., the general price level rose about 10% more than automobile prices). By this measure, Ford's 1978 labor compensation was equivalent to roughly $40,000 per employee in 1988 dollars. Actual labor compensation in 1988 exceeded this figure by $7,300 per worker. Similar calculations are shown for the gains allocated as returns to capital and to government tax authorities.

Over the 1978-1988 period, the total gains going to labor, capital and taxes amounted to $25,500 per employee. This is about $2700 less than the estimated productivity gain. The difference, which we impute to consumers, is a consequence of the fact that the "real" quality-adjusted price of motor vehicles rose more slowly than general price inflation. (In other words, Ford's revenue per employee was roughly $2700 less than it would have been had Ford been able to raise vehicle prices at the same rate as general inflation.) This $2700 was, therefore, not available to Ford's employees or stockholders; instead, it flowed to consumers in the form of lower prices. Thus, we can account for Ford's total productivity gain as follows: 25% went to employees in forms of higher wages and benefits, 45% represented an increase in the return to capital, 18% corresponded to an increase in taxes paid by Ford, and 10% represented a gain enjoyed by consumers in the form of lower real vehicle prices.

Comparison of Automotive Companies

Ford's distribution of 1978-1988 productivity gains are shown graphically in Figure 4 and compared with similar computations for GM, Chrysler, Toyota and Nissan. Several conclusions can be drawn from these data:

- The 1978-1988 productivity gains have been shared to some degree across all the stakeholder groups: employees, shareholders, government and consumers.

- Consumers in Japan captured a larger share of the benefits from auto industry productivity growth than did American consumers. This is true when consumer gains are measured in either absolute terms (dollars per worker), or as a proportion of the total gain in productivity. The reason for this pattern is that real auto prices fell faster in Japan than in the US.[11]

- Labor benefits have been weakly but positively related to the magnitude of productivity gains made by their employer. Toyota, which had the largest productivity gains, gave the largest increase in employee compensation; GM, with the smallest productivity gains, gave the smallest wage and benefit increase. But despite this correlation with company productivity, changes in labor compensation were fairly similar across the firms, suggesting that wages and salaries are largely set by market forces (and negotiations with national unions in the case of the American firms).

The returns to employees can be further subdivided into classes of workers, including hourly, salaried and top management. The financial reports for the auto companies vary in the extent to which they permit such an analysis. One labor compensation issue of considerable interest is the chief executive's pay. Particularly controversial during the 1980s was the compensation of Lee Iacocca, whose earnings through stock options exceeded the prevailing norms of the day.[12]

Our analysis provides some perspective on this CEO compensation issue. We find that while US auto executive pay levels may have been high in absolute terms, they have constituted a minuscule fraction of each firm's value-added. In 1986, the year of peak compensation for Lee Iacocca at Chrysler, his compensation of $20.5 million amounted to just over two-tenths of one percent of Chrysler's value-added (or $179 per employee). At the other extreme, Roger Smith's

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[11] The approach used to compute the estimates in Figure 4 takes consumer gains as an industry effect within each country, as domestic producers are assumed to charge identical prices for their output. The methodology can be extended to allow consumer gains to vary among companies. For example, in markets with differentiated products, firms may charge different prices, adjusting for quality. A firm which reduces its quality-adjusted price would gain market share while registering some drop in revenue (value-added) per unit of output. Given suitable assumptions, the consumer gains specific to each firm can be estimated, based on changes in market share.

[12] Stock option compensation is not a component of the firm's value added; stock options become valuable given an increase in expectations of future returns to shareholders. Supplementary calculations are therefore necessary to add the value of stock option compensation to salary and bonus pay.

peak annual compensation of $4.49 million in 1988 amounted to less than one-hundredth of one percent of GM's value-added (or $5.86 per employee). If top executives do have a major effect on their company's wealth creation, then successful executives are capturing only a small part of the return to their efforts.

IV. Factors Influencing the Distribution of Gains

Prior researchers in strategic management and economics have asked the question: Who captures the firm's economic rents?[13] Are rents appropriated by managers and workers, or do they go to the firm's shareholders? The framework developed in this paper embeds this question in a larger context of value creation, where gains flow also to the firm's customers. Indeed, rents are a subset of value creation---rents may be dissipated by competition, which shifts the value to consumers as prices fall. Thus, the issue of rent appropriation can be viewed as a component of the larger question of value appropriation by the firm's stakeholders.

The value created by the firm over a period of time is exactly equivalent to its (appropriately measured) productivity gain. If this incremental value can be maintained as Marshallian or monopoly rents, it is available to internal stakeholders (managers, workers and shareholders).[14] Otherwise, the incremental value flows to consumers in the form of price reductions (or alternatively, improvements in quality without corresponding increases in price).

The economist's ideal of welfare maximization involves rent appropriation just sufficient to compensate internal stakeholders for the inputs they provide. For example, managers and workers with superior skills capture Marshallian rents equal to the market value of their skill premium, and possibly an additional, contingent reward to motivate optimal effort. Shareholders are compensated for the cost of capital, appropriately adjusted for risk. Monopoly rents may be justified where they represent returns to innovation and risk taking (e.g, patents) and such rewards are necessary to motivate similar behavior in the future. The economist's notion of welfare maximization requires

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[13] See, for example, Barney (1986), Rumelt (1987), Rose (1987), Machin (1991), Bradburd and Pugel (1991), Peteraf (1993), Van Reenen (1996).

[14] See Peteraf (1993) for a discussion.

that all additional value creation flow to consumers, as the natural outcome of competitive market processes.

In practice, market imperfections commonly arise, and the distribution of the productivity gain is influenced by various of factors. These include competition among producers, labor market forces, the bargaining power of workers, and decisions by internal stakeholders regarding the fair distribution of gains. If domestic producers achieve similar gains in productivity while competing aggressively, most of the value created will flow forward to consumers in the form of lower prices. In less competitive environments, bargaining power and perceptions of fairness may influence the distribution of gains. For example, labor unions may be able to negotiate for a larger proportion of the surplus,[15] at the expense of consumers (higher auto prices), shareholders (lower corporate profits) and the government (lower corporate income taxes).[16] Our analysis suggests that government tax revenues will tend to be lowest when domestic firms have similar productivity levels and compete aggressively with each other, thereby forcing corporate profits to uniformly modest levels.

Typically, shareholders and other financial investors capture only a small proportion of the total value created by the enterprise. This is especially true in high technology industries where firms are progressive but compete with intense rivalry, leading to price reductions that cause the productivity gains to flow mostly to consumers (at the expense of shareholders). From the standpoint of national welfare, such vigorous competition and price reduction is generally preferable to the alternative scenario with highly profitable but stagnant firms.

Thus, there is no necessary connection between the amount of value created by the firm (productivity) and the net returns to shareholders (profitability). But viewed across firms within a given industry, productivity and profitability tend to be correlated. Figure 5 is a graph showing the

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[15] Rose (1987), Machin (1991).

[16] Conversely, if workers perceive that they fail to receive an equitable proportion of the gain, productivity growth may itself be jeopardized. A variety of gain-sharing methods have been proposed, with the aim of using the returns to gains as an incentive for productivity improvement. A useful collection of papers reviewing the empirical evidence can be found in Blinder (1990). The earliest and best-known of gain-sharing plans is the Scanlon Plan, developed in the 1930's. For background, see Lesieur (1958). In a different vein, Weitzman (1984) argues for a *revenue* sharing plan, which the author believes could dampen the business cycle as well as enhance productivity. Profit sharing is another approach, adopted by Ford and other companies in the 1980s.

relation between labor productivity and returns to capital for the five auto companies in 1978 and 1988. The changes in these measures over the decade are also plotted. All comparisons have been scaled relative to Toyota, the top-performing firm. The Figure suggests a strong tendency for productivity differences to flow to the bottom line as profit differentials.[17] This arises because labor compensation is more strongly influenced by national market forces than by the relative success of the firm.

V. Conclusions and Limitations

We have shown that a comprehensive, productivity-based measure of corporate value creation is relatively easy to compute and can be used to supplement more conventional measures of firm performance, such as profit and market share. Moreover, we have shown how productivity gains at the firm level are translated into some combination of higher wages, profits, taxes and consumer benefits. The US and Japanese auto manufacturers examined in this study show wide variation in recent productivity growth and the distribution of productivity gains. There have been large differences among firms within each country, as well as between the US and Japan.

Indeed, in making international comparisons of companies' performance, it is productivity rather than profit that provides the more insightful benchmark. Toyota excluded, Japanese manufacturing companies are typically much less profitable than their American counterparts, but their remarkable productivity performance in sectors such as autos and electronics has shaped the international competitiveness of the Japanese economy.

The methodology outlined in this study has a number of limitations. Our productivity-based measures of value creation capture the benefits flowing to most, but not all, of the stakeholders in a corporation. Omitted from our measures are the gains to more peripheral stakeholders, such as suppliers, venture partners, and community groups. Moreover, returns to employees in the form of stock options are not formally included, as they are based on market

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[17] Bao (1989) and Riahi-Belkaoui (1994) show that stock prices are more strongly linked to company productivity and value-added than to current profitability.

estimates of future returns rather than historical value-added. But stock option compensation can be assessed in supplementary calculations.

The method described in this paper for estimating company productivity and the distribution of gains cannot be readily applied to all companies, since it requires more information than is often publicly reported in the United States. To apply in every respect, it requires undiversified companies operating within a single country. Companies must also be generous in voluntarily supplying supplemental information on labor costs, which are not a required item in US accounting practice. In Japan and many European countries, accounting procedures follow a value-added format, so the necessary data are easier to obtain.

The American companies which qualify, nevertheless, are numerous and important. The automobile manufacturers which have been presented as a demonstration are vital to the economies of the US and Japan. Moreover, the automobile example demonstrates that meaningful results are possible even for companies that deviate moderately from a one country, one product ideal.

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Table 1.

FORD MOTOR COMPANY

	1978	1988
U.S. Price Indices		
GDP Deflator	100.0	172.3
PPI for motor vehicles	100.0	161.6

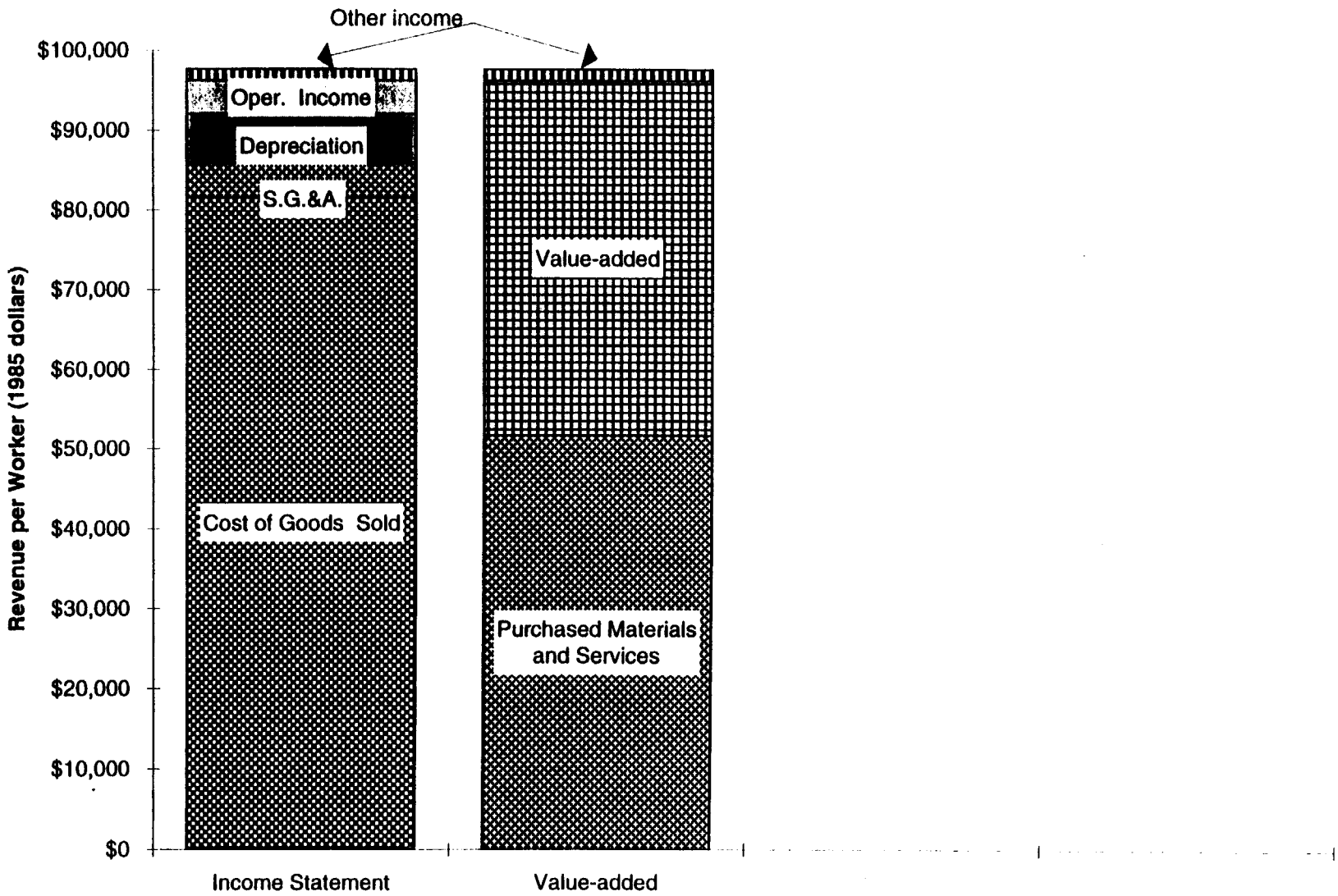
	1978 *(1978 $)*	1988 *(1988 $)*	1978 *(1988 $)*	Gain *(1988 $)*	Distribution of Gain
Per Worker					
Value-added*	33,319 #	82,909 #	55,274 **	28,246	
Wages & Benefits	23,088	47,061	39,782 *	7,279	25%
Return to Capital	5,760	22,911	9,924 *	12,987	45%
Taxes	4,472	12,939	7,705 *	5,234	18%
Consumers				2,746	10%
				28,246	100%

Includes net interest income and dividend income of $830 per employee in 1978 and $2,041 in 1988.

** Inflated to 1988 dollars using the PPI for motor vehicles

* Inflated to 1988 dollars using the GDP deflator

Figure 1. Four Views of General Motors 1985 Revenue



Four Views of General Motors 1985 Revenue

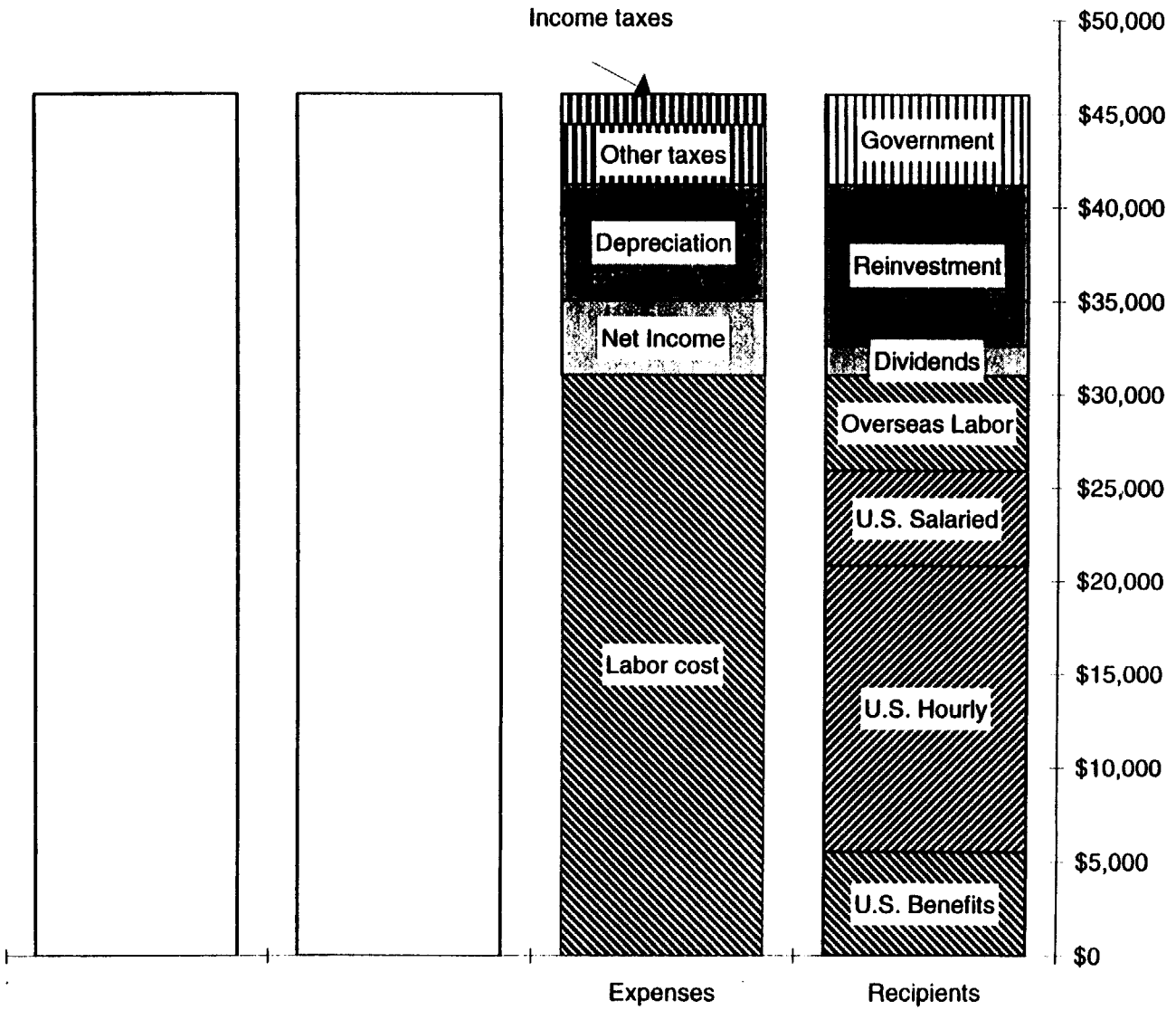


Figure 2. Distribution of Value-Added in 1978

($1 = 210 Yen, market exchange rate)

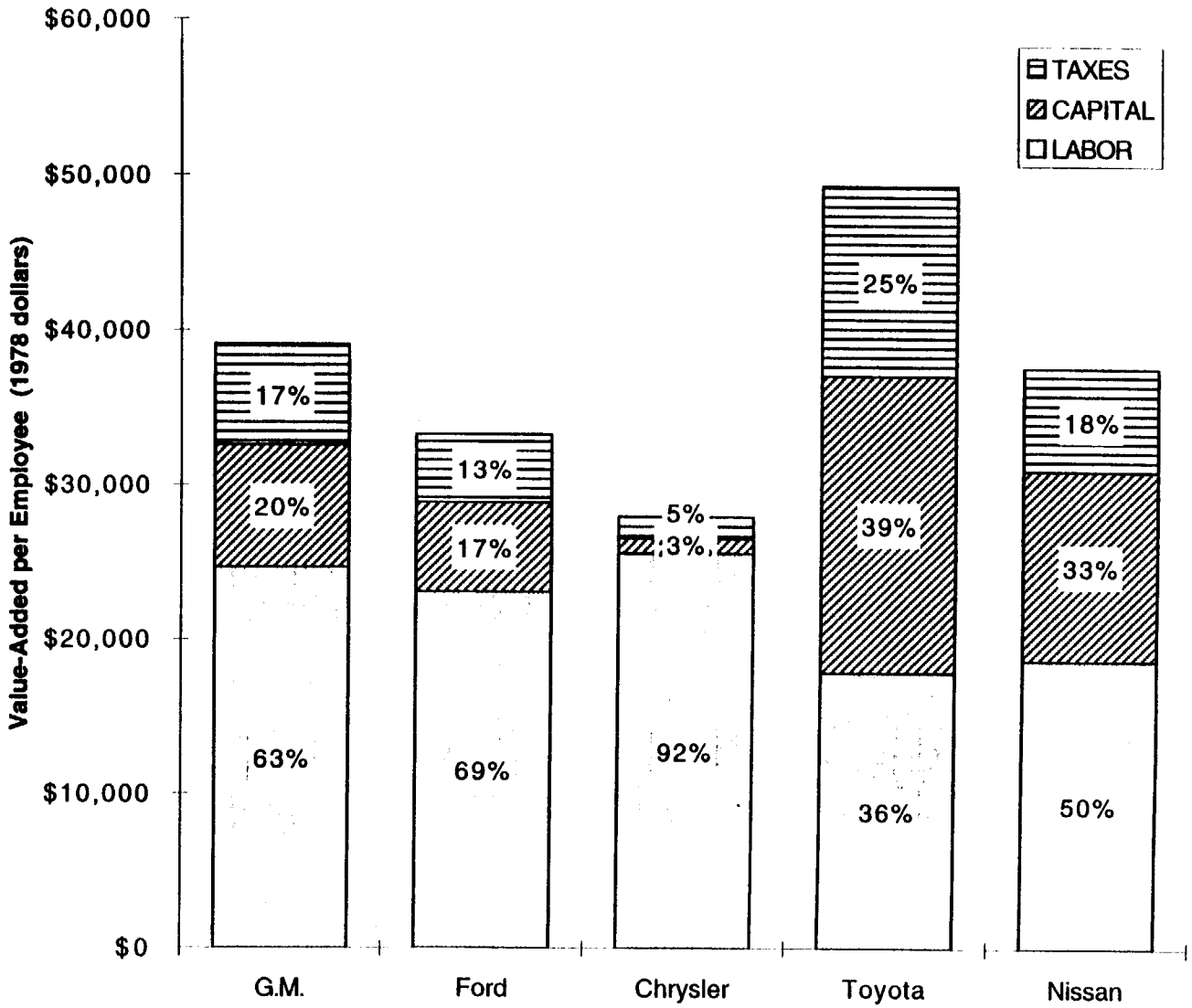


Figure 3. Distribution of Value-Added in 1988

($1 = 128 Yen, market exchange rate)

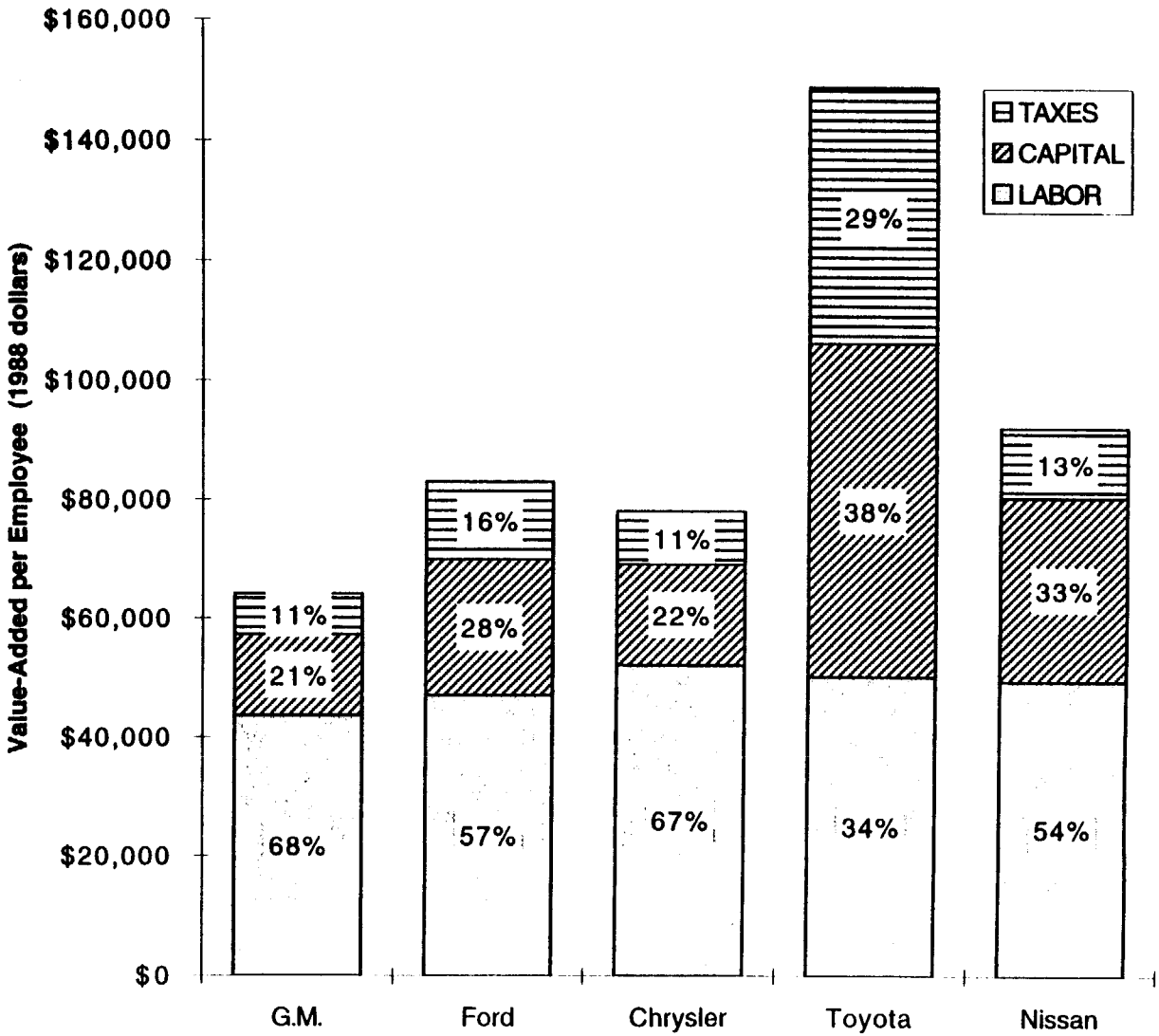


Figure 4. Distribution of Gains, 1978-88