

# Distributive shares in the US economy, 1964–2001

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Specifying the labour theory of value in a way that distinguishes both productive from unproductive labour, and production workers from supervisory workers, this paper considers distributive shares in the US economy between 1964 and 2001. Trends in productive and unproductive labour are explored in full-time equivalents, hours and money. After 1979, there was a large shift of money value (not matched by a shift in either hours or employment) from the wages paid to productive labour to those paid to supervisory labour. Since the wage share in money value added of non-supervisory labour in unproductive sectors was approximately constant, the 1980s and 1990s also saw the profits share squeezed by the rising wage share of supervisory workers. Some implications of this are explored in the construction of a class rather than a factor approach to distributive shares.

*Key words:* Productive and unproductive labour, Distributive shares, Wage share, Profit share, US economy  
*JEL classifications:* C82, E24, O51

## 1. Introduction

Within the Marxist tradition, a primary purpose is the description and explanation of the average rate of profit and its trend over time (Duménil and Lévy, 1993, 2002; Moseley, 1991, 1997; Shaikh and Tonak, 1994; Wolff, 2001, 2003). This time trend is shown in Figure 1 (see also Larkins, 2002). By 1982, compared with 1965, the rate of profit had more than halved. It then recovered in two stages, 1982–4 and 1991–7, peaking in 1997 at about three-quarters of its 1965 level, and falling sharply thereafter, so that by 2001 the rate of profit was just under 57% of its 1965 level.

A common approach to explanation begins by decomposing the profit rate. If  $r$  is the average rate of profit,  $\Pi$  is aggregate non-labour income,  $MVA$  is aggregate value added in money terms, and  $K$  is the aggregate of nonresidential fixed capital stock and work in progress, then

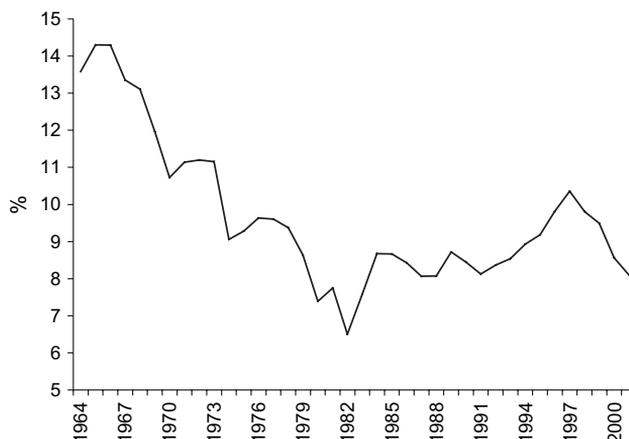
$$r = \frac{\Pi}{MVA} \frac{MVA}{K} \quad (1)$$

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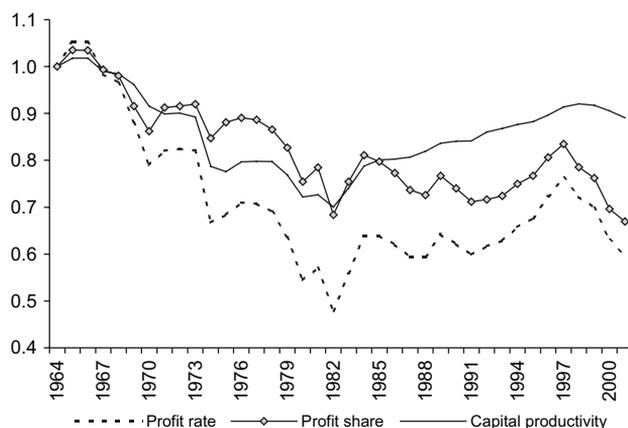
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**Fig. 1.** *The pre-tax average rate of profit, USA, 1964–2001.*



**Fig. 2.** *Profit rate, profit share and capital productivity, pre-tax, USA, 1964–2001 (1964 = 1).*

This separation of the profit rate into the product of profit share ( $\Pi/MVA$ ) and productivity of capital ( $MVA/K$ ) separates proximate distributional issues from a proximate focus on technology in the production process. Profit rate, profit share and capital productivity are illustrated in Figure 2, each series indexed to its 1964 level. Variations in both profit share and capital productivity contribute to the variation of the profit rate. In the downswing to 1982, they contribute 52.5% (profit share) and 47.5% (capital productivity) to the profit rate decline. In the upswing to 1997, these proportions are more than reversed to 43% (profit share) and 57% (capital productivity). In both downswing and upswing, capital productivity shows much less variability around trend than does the profit share. Finally, the post-1997 collapse in profitability is almost entirely attributable (89.7%) to a collapse in the profit share (although capital productivity also declined for the first time since 1982).<sup>1</sup>

<sup>1</sup> These percentages are calculated in the following way. If  $y = xz$ , then  $\Delta y = x' \Delta z + z' \Delta x$ , where  $x' = (x_1 + x_2)/2$  and  $z' = (z_1 + z_2)/2$ , the subscripts indicating the start year and finish year of the period over which the change is measured.

The literature analysing these trends is divided as to what parts of the surplus-based tradition to embrace and what to discard. In particular, there is no unanimity on how to address the distinction between productive and unproductive labour. The development of such a distinction was important to classical economists, because they were interested in accumulation, hence net investment, and hence the surplus out of which it was found. They were therefore concerned with what determined both the size of the surplus (identifying which labour produced it) and its distribution (so that ‘productive’ and ‘unproductive’ uses could be contrasted). But in the revival of the surplus-based tradition in the last third of the twentieth century, the categories of productive and unproductive labour have been among the most contested.<sup>1</sup>

In empirical work, Moseley (1991, 1997) uses the categories in a way which is central to his findings, and for Shaikh and Tonak (1994), too, the categories are central ones. But comparing these studies is difficult, because the results in each case are sensitive to the assumptions made in the construction of their respective data sets. For example, Moseley (1991) excludes all self-employment and assumes that half of the non-supervisory workers in Wholesale and Retail trade, all of the non-supervisory workers in Legal services, and all of the employees in Agriculture, forestry and fisheries are productive. Despite a broadly similar methodology of calculation, these are different assumptions from those made by Shaikh and Tonak (1994), who do account for the self-employed, assume that all workers in Wholesale and Retail trade, and Legal services are unproductive, and treat Agriculture, forestry and fisheries as an extractive industry, using relevant statistics from Mining as a proxy.<sup>2</sup> The differences that different assumptions make are significant. On the other hand, for Duménil and Lévy (1993, 1994, 2002), the categories of productive and unproductive labour are not helpful ones because they do not distinguish between managerial and clerical personnel, which Duménil and Lévy regard as creating important new class contradictions in capitalism. And while earlier work by Wolff (1987) explored the categories empirically (on the basis of still different assumptions in constructing the data), the precise ways in which they affected profitability were not explicitly explored, and the distinction between productive and unproductive labour is not used in his later work (Wolff 2001, 2003). Neither Brenner (1998, 2002) nor Gordon (1996) use the distinction at all, although the focus of this paper is otherwise similar to some of the themes of the latter.

This paper analyses distributive shares in the US economy from 1964 to 2001, from a Marxist perspective that uses the distinction between productive and unproductive labour. The next section summarises the theoretical framework originally specified in English by Foley (1982), and Section 3 considers how this framework can be operationalised.<sup>3</sup> The following section applies the theory to a constructed data set to explore trends in productive and unproductive labour, first as proportions of total labour (in full-time equivalents (FTES) and money) and, second, in wage terms, as proportions of money value added. It turns out that the main trends in distributive shares are captured by distinguishing production workers from supervisory workers, not by distinguishing productive labour from unproductive labour. The following sections use this feature to begin to consider causal explanations for the descriptive trends, considering a class shares rather than

<sup>1</sup> For an outline and survey of the distinction, see Mohun (2003).

<sup>2</sup> For a detailed exploration of the methodology of calculation employed by Shaikh and Tonak, see Mohun (2005).

<sup>3</sup> See also Foley (1986, 2000) and Mohun (1994, 2004).

a factor shares approach. A short conclusion then summarises, and outlines some unresolved issues.

## 2. Theoretical framework

### 2.1 *Productive and unproductive labour*

Labour is productive if it is wage labour, employed by capital in production for the market, and directly producing surplus value. Production here is used in two senses. In a narrow sense, it is the transformation of inputs into outputs, the creation of new or the alteration of existing use-values in privately owned production processes. However, production also has a wider sense, as an activity that produces surplus value from a *social* point of view. From this perspective, not all marketed activities reflect the creation of value. Activities purely involving the sale of the output and the purchase of inputs (commercial activities), or the mobilising of sums of money and credit to finance production (financial activities) are not part of production. For all that these activities employ large numbers of people in wage labour relationships, they are concerned with alterations of the form in which produced value exists, or with organising precommitments and claims on future produced value. Because they circulate value rather than create it, they are unproductive. While some workers are productive and some unproductive, all are subject to supervision by those personifying the control of capital. Such supervisory labour is unproductive.<sup>1</sup>

Call the sectors employing productive labour 'productive sectors', and those embracing commercial and financial sectors 'unproductive sectors'. Then the working class performs both productive labour (producing surplus value) and unproductive labour (altering the form in which value exists in circulation), both supervised by unproductive capitalist labour. While the wage relation compels all members of the working class to perform surplus labour, subject to the same pressures from their employers' pursuit of profitability, not all of the unpaid labour of the working class is monetised. Only that of productive workers achieves a monetary form, as money surplus value. This is then, via unequal exchange in the market, divided between the wages of unproductive labour on the one hand, and non-labour incomes on the other.

### 2.2 *Labour values and monetary prices*

The way in which production is theorised follows the framework proposed by Foley (1982). The market commensurates different activities by measuring them all in terms of money, and the aggregate of such transactions going to final demand measures in monetary terms how much new value is produced. All such value added is a result of the activities of productive labour, and its location in unproductive sectors is attributed to the market mechanism of unequal exchange. It follows that total value added in money terms and the total hours worked by productive labour are two different expressions of the same activity. Because they measure the same thing, they can be equated, but, because they are differently denominated, their equation requires a variable which converts the one unit of measure into the other. Define the value of money ( $VM$ ) as the hours of productive labour time per dollar of value added (its inverse, the number of dollars represented by one hour of productive labour-time, is the monetary equivalent of labour-time). If 'money value added'

<sup>1</sup> These are definitions. Whether they are useful depends upon whether they are consistent with the other basic categories of a surplus-based approach, and if so, whether their use adds anything to the analysis, either from the perspective of theory or from the perspective of empirical analysis. This paper presumes consistency, and confines itself to exploring what the categories can add to empirical understanding.

(*MVA*) measures in dollars exactly what the total hours of productive labour ( $H_p$ ) measure in terms of time, then

$$MVA = \frac{H_p}{VM} \quad (2)$$

The aggregate relationship of equivalence between a value and a price category expressed by equation (2) does not in general apply to individual commodity outputs. The (tendential) equalisation of the rate of profit enforced by competition entails that commodities produced with different compositions of capital cannot in general sell at prices proportional to their labour values. This does not, however, apply to the capacity to work, or labour power, which is an attribute of people that is sold for defined periods of time. It is not produced in a capitalist production process, and neither are the people of whom it is an attribute. No composition of capital, no prices and no equalisation of the rate of profit are involved in the (re)production of people. Hence there is no reason to think that labour power is not on average sold at its value. Let the value of labour power per hour of labour hired be denoted by *VLP*, and the hourly wage rate of productive labour by  $w_p$ . Then

$$w_p = \frac{VLP}{VM} \quad (3)$$

Assuming that the hours of labour hired are the hours of labour worked,<sup>1</sup> combining equations (2) and (3) immediately measures the value of labour power as the share of productive wages ( $W_p$ ) in money value added

$$VLP = \frac{w_p H_p}{MVA} = \frac{W_p}{MVA} \quad (4)$$

Multiplying the value of labour power per hour of labour hired by the number of hours hired defines aggregate variable capital in hours, and hence immediately from equation (3), aggregate wages of productive labour are equal to their labour time equivalent divided by *VM*. Since surplus value is all value added that is not paid to productive labour, it follows that surplus value in money terms (*MSV*) is

$$MSV = MVA - W_p \quad (5)$$

which is equal to surplus value measured in hours divided by *VM*.

In sum, the value of money is the constant of proportionality that equates first, *MVA* and total hours worked by productive labour ( $H_p$ ), second, aggregate variable capital measured in money ( $W_p$ ) and aggregate variable capital measured in hours ( $VLP.H_p$ ), and third, *MSV* and aggregate surplus value measured in hours ( $(1 - VLP)H_p$ ). This motivates the approach taken here to use monetary aggregates to measure their corresponding labour value aggregates. Finally, while total money surplus value is produced by productive labour, it is redistributed through the market, and some of it appears as the revenue accruing to commercial and financial activities out of which the labour employed in such activities is paid. For total wages ( $W$ ) are the sum of wages paid to productive labour ( $W_p$ ) and to unproductive labour ( $W_u$ ), and, since *MVA* is the sum of total wages and profits ( $\Pi$ ), equation (5) implies

$$MSV = \Pi + W_u \quad (6)$$

<sup>1</sup> Which is to gloss over an important site of daily class struggle.

**Table 1.** *Productive and unproductive divisions (by SIC)*

| Divisions with some productive labour         | Divisions with no productive labour   |
|---|---------------------------------------|
| Agriculture, forestry and fishing             |                                       |
| Mining  |                                       |
| Construction                                  |                                       |
| Manufacturing                                 |                                       |
| Transportation and public utilities           |                                       |
| Retail trade: eating and drinking places (58) | Wholesale trade                       |
| Productive services                           | Remainder of Retail trade (5 less 58) |
| Government enterprises                        | Finance, insurance and real estate    |
|   | Unproductive services                 |
|   | General government                    |

Thus total wages paid to unproductive labour are a deduction from total money surplus value.

### 3. Empirical data issues

The basic data used are the National Income and Product Accounts (NIPA) data produced by the US Department of Commerce's Bureau of Economic Analysis (BEA), broken down by industrial division according to the 1972 SIC (1964–87) and 1987 SIC (1987–2001), and labour statistics data produced by the US Department of Labor's Bureau of Labor Statistics (BLS). In general, the procedure is first to calculate the number of productive workers by major SIC division, and then to calculate a relevant wage so that multiplying the two together gives variable capital in money terms.

First, each major SIC category is allocated to a position in the circuit of capital according to whether it involves the production of new value or whether it is located entirely in the circulation part of the circuit, embracing exclusively commercial and financial functions. This allocation is listed in Tables 1 and 2.

Second, within each SIC division or subdivision, BLS data are used to identify all non-supervisory labour together with working supervisors. The data exclude proprietors, the self-employed, unpaid volunteer or family workers, farm workers, domestic workers and non-civilian government employees; they also exclude all those on lay-off, on unpaid leave, on strike, and newly hired but not yet reported. BLS identify working supervisors and all non-supervisory labour as 'production and related workers' in mining and manufacturing, 'construction workers' in construction, and 'non-supervisory employees' in private service-producing industries (US Department of Labour, Bureau of Labour Statistics, 1994, p. 1221). In this paper, all three categories together are called 'production workers'. For each SIC division and subdivision, the ratio of BLS production workers to all BLS employees is calculated. Applying this ratio to NIPA employment data gives the number of production workers in each SIC division.<sup>1</sup> Those who are not production workers are those above working supervisor level engaged in the process of managing the activities of production workers. Call them 'supervisory workers'.

<sup>1</sup> NIPA employment is 'persons engaged in production by industry', comprising full-time employees, part-time employees converted to a full-time basis, and the self-employed and small proprietors. The self-employed in each SIC division are thereby presumed to divide between production and non-production workers in the same proportions as employees in that SIC division.

**Table 2.** *Productive and unproductive services (by SIC)*

| Service with some productive labour   | Services with no productive labour  |
|---|---|
| Hotels and other lodging places (70)<br>Personal services (72)<br>Productive Business services:<br><br>Services to buildings (734)<br><br>Computer and data processing (737)<br>Photofinishing laboratories (7384)<br><br>Auto repair, services, and parking (75)<br>Miscellaneous repair services (76)<br>Motion pictures (78)<br>Amusement and recreation services (79)<br>Health services (80)<br><br>Educational services (82)<br>Social services; membership organizations (83, 86)<br>Productive Misc. professional/ Other services:<br><br>Engineering, architectural and surveying (871)<br><br>Other Research and testing services (873 less 8733) | Unproductive Business services:<br>Advertising (731)<br>Credit reporting and collection (732)<br>Mailing, reproduction, stenographic (733)<br><br>Misc. equipment rental and leasing (735)<br>Personnel supply services (736)<br><br>Other Misc. business services (738 less 7384)<br><br>Legal services (81)<br><br>Unproductive Misc. professional/ Other services:<br>Museums, botanical and zoological gardens (84)<br><br>Accounting, auditing, bookkeeping (872)<br>Non-commercial research organisations. (8733)<br>Management and public relations (874)<br>Services n.e.s. (89)<br>Private households (88) |

The third step then applies annualised BLS production worker weekly wages to the numbers of production workers, adjusting so as to include employee and employer superannuation payments and the like. And the final step applies annualised BLS production worker weekly hours worked to the numbers of production workers to determine the hours figures. This determines the number of FTES, the annual labour income, and the annual hours worked of production workers by SIC division and subdivision. Summing across productive SIC sectors determines the measures for productive labour. Measures for supervisory workers are determined by subtraction of the figures for production workers from the relevant totals. Measures for unproductive labour are determined by summing production workers across unproductive SIC divisions and subdivisions, and then adding the figures for supervisory labour from all SIC divisions and subdivisions.<sup>1</sup>

<sup>1</sup> Further details are given in the Appendix and in Mohun (forthcoming). All the figures and tables below use these constructed data.

**Table 3.** *Productive and unproductive labour to total labour, ftes and \$, selected years, USA*

|                      | Production workers |      |      | Supervisory workers |      |      | All workers |       |       |
|----------------------|--------------------|------|------|---------------------|------|------|-------------|-------|-------|
|                      | 1964               | 1979 | 2000 | 1964                | 1979 | 2000 | 1964        | 1979  | 2000  |
| Productive sectors   |                    |      |      |                     |      |      |             |       |       |
| FTES                 | 48.6               | 47.4 | 46.1 | 11.1                | 11.9 | 11.0 | 59.7        | 59.3  | 57.1  |
| wages                | 50.1               | 48.0 | 35.5 | 22.6                | 23.8 | 28.0 | 72.7        | 71.8  | 63.5  |
| Unproductive sectors |                    |      |      |                     |      |      |             |       |       |
| FTES                 | 36.0               | 35.0 | 36.2 | 4.3                 | 5.7  | 6.7  | 40.3        | 40.7  | 42.9  |
| wages                | 18.4               | 17.2 | 17.6 | 8.9                 | 11.0 | 18.9 | 27.3        | 28.2  | 36.5  |
| All sectors          |                    |      |      |                     |      |      |             |       |       |
| FTES                 | 84.6               | 82.4 | 82.3 | 15.4                | 17.6 | 17.7 | 100.0       | 100.0 | 100.0 |
| wages                | 68.5               | 65.2 | 53.1 | 31.5                | 34.8 | 46.9 | 100.0       | 100.0 | 100.0 |

The dates 1964–2001 defining the study are chosen by the data. Prior to 1964, there are not sufficient data. After 2001, the 1987 Standard Industrial Classification (SIC) was replaced by the 1997 North American Industry Classification System (NAICS). Significant dates for comparisons across time are chosen as follows. 1979 represents the cycle peak of January 1980, and 2000 the cycle peak of March 2001. Properly, 1969 should be taken to represent the cycle peak of December 1969, but this loses the 1960s data, and 1964 is used instead (which makes little difference to the trends identified).<sup>1</sup> Hence the years 1964–79 and 1979–2000 are used below to summarise the data.

#### 4. Empirical results 1964–2001

The procedures of the previous section provide data (in FTES, hours and dollars) on production workers in productive sectors (productive labour), production workers in unproductive sectors, supervisory workers in productive sectors and supervisory workers in unproductive sectors (the components of unproductive labour). These data are described first in terms of proportions of total labour, and second in wage terms as proportions of *MVA*.

##### 4.1 Proportions of total labour

Table 3 describes the four categories of labour, where each cell is expressed as a proportion of the total of each measure. Several features are noteworthy.

- (1) In terms of overall share, FTES in the productive sector contracted (and the unproductive sector expanded) by some 2.6 percentage points over the whole period. In terms of wages, the negative shift was much larger at 9.2 percentage points. Most of these shifts occurred after 1979.
- (2) Within the productive sector, the contraction in share of FTES is a relative contraction of production workers. The share of supervisory workers barely changes. By contrast, within the unproductive sector, the growth in share of FTES is a relative expansion in supervisory workers; the relative share of production workers barely changes.

<sup>1</sup> Peak dates are those announced by the NBER.

**Table 4.** *Decomposition of total ATB wage growth, USA, selected periods*

| Average annual rates of growth (%) | Total wages (\$1996) | Total FTES | Hours per FTE | Hourly wage rate (\$1996) |
|------------------------------------|----------------------|------------|---------------|---------------------------|
| 1964–1979                          |                      |            |               |                           |
| Productive production workers      | 3.6                  | 2.2        | −0.6          | 2.0                       |
| Unproductive production workers    | 3.4                  | 2.1        | −0.3          | 1.6                       |
| Supervisory workers                | 4.6                  | 3.2        | −0.3          | 1.7                       |
| 1979–2000                          |                      |            |               |                           |
| Productive production workers      | 1.4                  | 1.5        | −0.2          | 0.1                       |
| Unproductive production workers    | 3.0                  | 1.8        | −0.1          | 1.2                       |
| Supervisory workers                | 4.4                  | 1.7        | −0.1          | 2.7                       |

- (3) Within the production worker category, those working in unproductive sectors (just over a third of all employment) saw very little change in their relative position, whether in numbers or wages. The relative growth of production workers in Finance, insurance and real estate and in unproductive service sectors (notably unproductive Business services) almost exactly matches their relative decline in Wholesale and Retail trade (excluding Eating and drinking places). This overall constancy is remarkable.
- (4) Production workers in productive sectors (productive labour) saw a collapse in their relative wage share of some 14.6 percentage points. Just over a third of this shift in share accrued to supervisory workers in productive sectors, and just under two-thirds to supervisory workers in unproductive sectors.
- (5) Supervisory workers in productive sectors (a stable proportion of 11–12% of total employment) saw their share of total wages rise by almost a quarter, to 28% of all wages. Supervisory workers in unproductive sectors increased their share of ftes by more than half, albeit from a low base, so that they were still less than 7% of total employment by 2000. However, they more than doubled their wage share to nearly a fifth of all wages. Most of these increases occurred after 1979.

The change in wages can be decomposed in a different way, by considering total real wages (product wages at 1996 prices) as the product of the number of FTES employed, the hours each FTE on average works, and the real wage per hour each FTE is paid.<sup>1</sup> This is shown in Table 4, where supervisory workers in productive and unproductive sectors have been combined.

In the later period compared with the earlier, and across all categories of labour, employment growth is slower, and the decline in hours worked is slower. But for production workers in unproductive sectors, hourly real wage growth falls by a quarter (from 1.6% p.a. to 1.2% p.a.); and for productive workers, it collapses from 2% p.a. to barely more than a zero rate of growth. By contrast, for supervisory workers, annual hourly real wage growth after 1979 is more than half as much again as in the earlier period, and more than 27 times higher than the concurrent annual hourly real wage growth of productive workers.

Hence, while the growth in total real wages of production workers is always more due to growth in employment than anything else, and the same is true for the growth in

<sup>1</sup> Because of data difficulties, the deflator used is the implicit *NDP* deflator from the NIPA. While this is not quite the desired *MVA* deflator, the effect of any difference is unlikely to be large.

supervisory real wages in the earlier period, it is not true for the growth in supervisory real wages in the later period. The wage data therefore bear further examination.

#### 4.2 Proportions of money value added

*MVA* is the sum of wages and profits. In terms of the data categories identified above, total wages are the sum of production wages in productive sectors, denoted  $W(pn, p)$ , production wages in unproductive sectors, denoted  $W(pn, u)$ , and supervisory wages in each sector, denoted  $W(s, p)$  and  $W(s, u)$  respectively, or  $W(s)$  in total. Hence

$$MVA = W + \Pi \quad (7)$$

where

$$W = W(pn, p) + W(pn, u) + W(s) \quad (8)$$

$$W(pn, p) = W_p \quad (9)$$

$$W(pn, u) + W(s) = W_u \quad (10)$$

##### 4.2.1 Total wages

Combining equations (7) and (8) and dividing through by *MVA* yields

$$1 = \left( \frac{W_p}{MVA} + \frac{W_u(pn, u)}{MVA} + \frac{W(s)}{MVA} \right) + \frac{\Pi}{MVA} \quad (11)$$

If profits are a residual, they are proximately determined by the behaviour of the aggregate wage share, which is shown in Figure 3. A conventional factor shares approach suggests a wage squeeze on profits from the mid-60s to the early 1980s, the wage share rising by some 10 percentage points of *MVA*. Thereafter, the wage share behaves counter-cyclically, but within narrower bounds. While the lack of constancy in factor shares over a third of a century is interesting, the behaviours of the components of wages in equation (8) are sufficiently dissimilar to warrant further disaggregation.

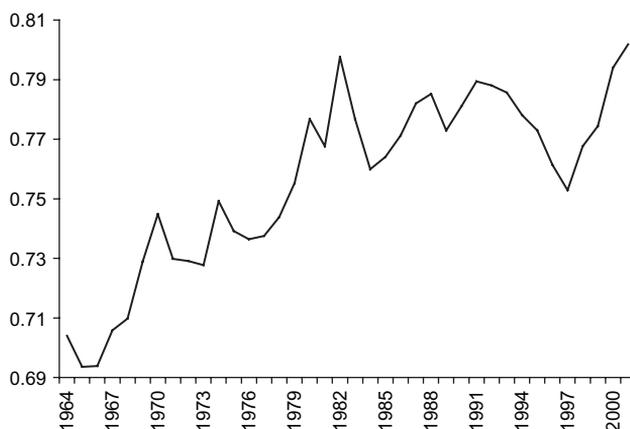


Fig. 3. Share of total wages in money value added, USA, 1964–2001.

4.2.2 Productive wages

By equation (4) the wage share of productive labour in *MVA* measures the value of labour power, and is shown in Figure 4. Considering the value of labour power is equivalent to considering the rate of surplus value (*e*), since by dividing equation (5) through by productive wages and using equation (4)

$$\frac{MSV}{W_p} = e = \frac{1 - VLP}{VLP} \tag{12}$$

so that

$$VLP = \frac{1}{1 + e} \tag{13}$$

From 1964 to 1979, the value of labour power was fluctuating with increasing amplitude around a flat trend (a mean of 35.8% and a coefficient of variation of 1.47%). After 1979, there is a major change, and the value of labour power fell every year thereafter (apart from a small rise in the first half of the 1990s and again in 2000–01).

The proximate cause of the behaviour of the *VLP* is not difficult to identify. Since *MVA* is the product of a price variable ( $p_{mva}$ ) and money value added in real terms (*RMVA*), and total wages paid to productive workers are the product of the hourly wage rate they are paid ( $w_p$ ) and the number of hours they work ( $H_p$ ), then

$$VLP = \frac{w_p H_p}{p_{mva} RMVA}$$

which can be rewritten as

$$VLP = \frac{w_p / p_{mva}}{RMVA / H_p} \tag{14}$$

Hence the value of labour power is the ratio of the real (product) wage to labour productivity, so that the value of labour power rises if real wage growth exceeds productivity growth, and falls if productivity growth exceeds real wage growth. Figure 5 shows the two series in equation (14), indexed to 1964 and expressed in natural logs. This makes explicit

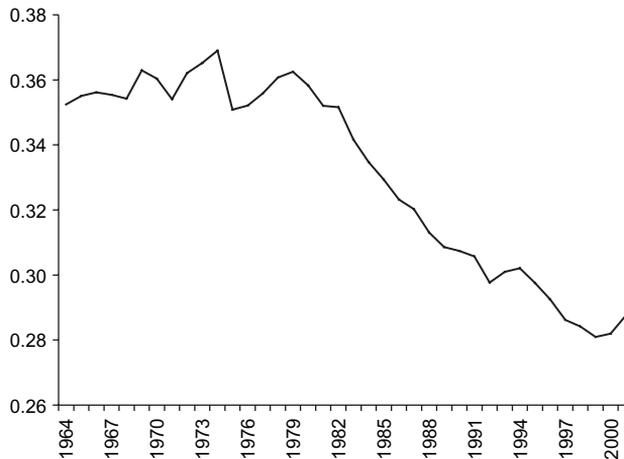


Fig. 4. The value of labour power, USA, 1964–2001.

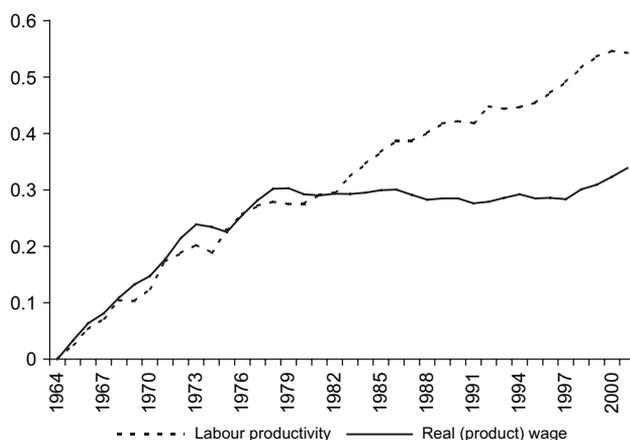
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the nature of the turning point at the end of the 1970s. For productivity growth was virtually zero from 1978 to 1980 and the level of the real wage peaked in 1979; while the two series moved together before 1979 (apart from a brief period in the mid-1970s, soon corrected), after 1979 they behaved completely differently. Productivity growth resumed after 1980, but the real hourly wage rate showed no growth at all for two decades (a mean of \$14.60 per hour at 1996 prices, and a coefficient of variation of 0.85%).

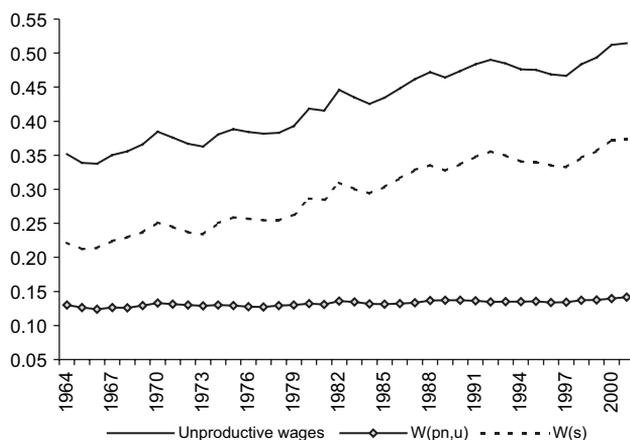
## 4.2.3 Unproductive wages

Figure 6 shows the wage share of unproductive labour in *MVA*, and its components, the wage shares in *MVA* of production workers in unproductive sectors and of supervisory wages. Two features stand out.

- (1) The relative growth of unproductive labour's wage share of *MVA* is *not* attributable to any relative growth of the wage share of production workers in unproductive sectors. Over the whole period, employment of production workers in unproductive sectors



**Fig. 5.** Labour productivity and the real (product) wage (indexed to 1964, in logs), USA, 1964–2001.



**Fig. 6.** Wage share of unproductive labour and its components in *MVA*, USA, 1964–2001.

averaged 36% of total employment, with a coefficient of variation of only 1.1%. Their wage share of *MVA* displays a similarly flat trend (averaging 13.2% of *MVA*, with a coefficient of variation of 3.1%). Thus there was no significant relative increase in the absorption of *MVA* by the wages of production workers in unproductive sectors.

- (2) The rising wage share of unproductive labour in *MVA* is attributable to *the rising wage share in MVA of supervisory workers*. The wage share of supervisory workers in *MVA* was 22.2% in 1964 and rose some 4 percentage points in 15 years. Thereafter the rise accelerated, reaching 35.6% in 1992, and, after a mid-1990s fall, 37.2% by the end of the century, a rise of some 11 percentage points over the 21 years since 1979.

#### 4.2.4 The share of profits in *MVA*

The share of profits in *MVA* is shown in Figure 2 (and implicitly in Figure 3). In terms of level, it fell from 30.6% in 1965 to 20.2% in 1982. This loss of a third of its total share occurred in two roughly equal phases, 1966–70 and 1978–82. After a sharp rebound from 1982–84, the downward trend resumed to 1991. The share then rose from 21.1% to 24.7% in 1997, followed by a collapse to 19.8% in just four years. Despite the pressure on the wages of production workers (whether productive or unproductive), there has been no sustained recovery of the profit share since its 1982 trough, and indeed by 2001 the profit share was lower than its 1982 trough.

By rearranging equation (11) and using equations (14) and (4), the profit share can be written as

$$\frac{\Pi}{MVA} = \frac{RMVA/H_p - w_p/p_{mva}}{RMVA/H_p} - \frac{W(pn, u)}{MVA} - \frac{W(s)}{MVA} \quad (15)$$

The profit share is proximately determined by the difference between *MVA* and wages, and more specifically by the difference between labour productivity and the real wage (of productive workers), *less what is absorbed by the wages of unproductive labour*. This latter has been the focus of some discussion in the surplus-based literature (Wolff, 1987; Moseley, 1991, 1997). The basic idea is that, because the wages paid to unproductive labour are a deduction from money surplus value, they reduce the funds available for investment, and this must constrain accumulation possibilities and cut into profitability. Why this should be is attributed to the difficulties of increasing productivity in unproductive sectors.

The wage share of unproductive labour in *MVA* was around a tenth higher in the late 1970s compared with 1964, and over the same period the rate of profit was falling. But the period of the recovery of the rate of profit saw a sharper rise in unproductive labour's wage share, to 51.2% of *MVA* by 2000, some 6.8 percentage points of *MVA* higher than its 1982 value when the rate of profit reached its trough. Thus the greater part of the rise in the wage share of supervisory workers in *MVA* occurred over the period after 1982 when Table 3 shows that supervisory employment was a constant share of total employment, and Figure 1 shows that the rate of profit was broadly rising. Hence trends in profitability cannot be explained by any trend in the wage share in *MVA* of production workers in unproductive sectors, for this trend was flat. Neither can they be explained by the trend in the wage share in *MVA* of supervisory workers, for this rose when the profit rate fell, and rose still faster when the profit rate recovered. Thus the argument that trends in profitability are explicable in terms of trends in the wage share of *MVA* paid to unproductive workers is not supported by the data.

What is striking about the trends outlined is how little of the excess of hourly productivity over the hourly wage rate of productive labour accrued to profits. Neither was this excess

**Table 5.** *Growth in shares of MVA, USA, selected periods*

| % points growth: wage shares of <i>MVA</i> | 1964–1979 |         | 1979–2000 |         |
|--|-----------|---------|-----------|---------|
|  | Total     | Average | Total     | Average |
| Production workers in productive sectors   | 1.01      | 0.07    | –8.05     | –0.38   |
| Production workers in unproductive sectors | 0.01      | 0.00    | 0.96      | 0.05    |
| Supervisory workers                        | 4.11      | 0.27    | 10.97     | 0.52    |
| Profits                                    | –5.12     | –0.34   | –3.87     | –0.18   |
| Productive labour                          | 1.01      | 0.07    | –8.05     | –0.38   |
| Unproductive labour                        | 4.11      | 0.27    | 11.93     | 0.57    |
| Profits                                    | –5.12     | –0.34   | –3.87     | –0.18   |
| Production workers                         | 1.01      | 0.07    | –7.09     | –0.34   |
| Supervisory workers                        | 4.11      | 0.27    | 10.97     | 0.52    |
| Profits                                    | –5.12     | –0.34   | –3.87     | –0.18   |

absorbed by the wages of production workers in unproductive sectors. Instead, it was largely absorbed by the wages of supervisory workers. The growing extraction of surplus value out of productive labour, which is so marked a feature of the US economy after 1979, was appropriated not as corporate profits, but primarily as the labour incomes of supervisory workers. In this sense, the relatively feeble recovery of the profit share from its 1982 trough is testament to a profits squeeze, but by the wages of the 18% of the employed labour force who were supervisory workers, not by the 82% who were production workers, whether in productive or in unproductive sectors.

#### 4.2.5 Summary

Because the wage share of production workers in unproductive sectors (shown in Figure 6) was approximately constant, it does not matter very much in terms of trends, whether a productive and unproductive labour distinction is used, or a production worker and supervisory worker distinction is used. That is, shares of *MVA* can be written in terms of productive and unproductive labour

$$1 = \frac{W_p}{MVA} + \left( \frac{W_u(pn, u)}{MVA} + \frac{W(s)}{MVA} \right) + \frac{\Pi}{MVA} \quad (16)$$

or in terms of production workers and supervisory workers

$$1 = \left( \frac{W_p}{MVA} + \frac{W_u(pn, u)}{MVA} \right) + \frac{W(s)}{MVA} + \frac{\Pi}{MVA} \quad (17)$$

The trends are the same from 1965 to 1979, and very little different after 1979. Table 5 makes explicit the trend shown in Figure 6.<sup>1</sup>

<sup>1</sup> Varying the choice of endpoint dates makes a small difference. The wage share of production workers in unproductive sectors shows a fluctuating growth totalling 0.5 percentage points of *MVA* between 1964 and 1979, and a similar record from 1979 to 1997. From 1997 to 2000, there is then another total growth in share of just under 0.5 percentage points. This is obscured by using the peak profit rate date of 1965 and the business cycle peak dates of 1979 and 2000 in Table 5.

### 4.3 Routes to an explanation

Description and explanation of growing wage inequality has been the subject of a large literature (Bound and Johnson, 1992; Levy and Murnane, 1992; Freeman, 1995; Richardson, 1995; Wood, 1995; Gottschalk, 1997; Johnson, 1997; Topel, 1997; Katz *et al.*, 1999). Most focuses on investigating trade-based and technology-based causes, although some attention is also paid to changes in the institutional setting (Fortin and Lemieux, 1997; Katz *et al.*, 1999).

#### 4.3.1 Trade-based causes

In an increasingly globalised economy, international competition has intensified, putting high wage economies like that of the US at a significant disadvantage. On the supply side of the labour market, wage disparities between the US and developing countries attract low-skilled migrant labour to the US, putting downward pressure on US unskilled wages. As regards the demand for labour, those US firms that could in principle relocate their production facilities overseas in lower wage economies either do so, or threaten to do so. Further, exports from developing countries have increased their penetration of US markets through their ability to undercut US firms on price because of their substantially lower wage cost base. Not only has this put general downward pressure on US wage levels; it has also shifted the composition of labour demand in the US towards higher skilled labour less subject to comparative disadvantage.

Critics have argued that, first, the explanation focuses on tradeables (especially manufacturing), whereas the wage trends described above apply to both tradeables and nontradeables sectors. Second, studies that attempt to measure the impact of foreign competition on US wages generally find only small effects. Third, the impact of migrant labour on US wages appears to be similarly modest (Gordon, 1996, pp. 188–200).

#### 4.3.2 Technology-based causes

The other explanation focuses on the way in which the development of technology has shifted the demand for labour towards higher skilled workers, condemning those with fewer skills to compete in growing numbers for a declining pool of unskilled jobs. Because the supply of lower skilled workers did not increase in the 1980s relative to earlier decades, and because there was no significant shift in employment away from lower-skilled industries and towards higher skilled ones, the ‘skills-mismatch’ argument concentrates on a shift in demand within industries through which technological change has established higher skills premiums.

Again there are some difficulties (Gordon, 1996, pp. 178–88). First, there are some timing problems, such as why the acceleration of computerisation occurred after a major deterioration in real hourly earnings in the bottom half of the wage distribution. Second, productivity growth in the non-manufacturing sector has been relatively low, which is the opposite of what a skill-biased technological change argument would predict. Third, empirical studies tend to identify the educational level of a worker with the skills requirement of a job; but direct investigations of the latter have found neither acceleration of demand for skills in the 1980s nor increase in the inequality of the distribution of skill requirements. Fourth, there is only weak evidence associating skill requirements with pay (marginal productivity arguments notwithstanding). Finally, interpretation of the data becomes problematic as soon as it is recognised just how sex-suffused a category ‘skill’ is (Phillips and Taylor, 1980). The conventional approach presumes that higher skills are more rewarded because of the greater bargaining power that accrues to their possessors; a feminist approach might rather argue that greater bargaining power (through the ability

to exclude, which may or may not be related to skills acquisition) leads to the recognition of skills, and hence to the designation of much women's work as unskilled.

#### 4.3.3 *Class-based causes*

Focusing on market forces is important, because the market mechanism is the means whereby value is realised in locations other than where it is produced, and the means whereby surplus value is appropriated. But focusing on the market and its individual agents can say little about transformations in the manner in which value and surplus value are produced. In the marketplace, agents are individualised, whereas in the production of value and surplus value, agents are exemplars of conflictual class forces. A surplus-based approach focuses attention in this direction, but making it more precise first requires an elaboration of the category 'class'.

#### 4.4 *Class structure*

Classically, those who sell their labour-power for a wage and thereby work for others, are the 'working class'. Their position is structurally determined by their lack of significant access to the means of production, whether non-market access through direct possession, or market access through possession of financial resource. Forced into the labour market in order to gain access to consumption commodities, the working class is employed by the 'capitalist class'.

But identifying the capitalist class is not a simple matter of contrasting employee and employer, because most employers are themselves employed by companies with limited liability. Neither is it a simple matter of legal ownership, because ownership of companies is generally diffuse, with significant roles played by pension funds and insurance companies, most of whose investment proceeds are ultimately destined for the working class. For Marx, those who acted as the 'bearers' of the capital relation are the 'capitalist class'. The issue then is how widely to draw the boundary that identifies those who exercise the control of capital.

Shaikh and Tonak (1994, pp. 305, 321–2) draw the boundary narrowly, so that, of employees in employment, only corporate officers are capitalists. Officers of corporations are self-evidently the personifications of those corporations, but the disadvantage of this narrow definition is that functions of control are wider than those exercised by corporate officers, and to define only those functions of control exercised by the latter as specifically capitalist is arbitrary, driven only by a legal relationship.

The approach taken here is wider, and assigns to the capitalist class all those above shop-floor level who exercise functions of supervision and control. Empirically, this is straightforward: supervisory workers are identified as the capitalist class. Theoretically, there are some distinct disadvantages to this wide definition. Over the last century, the separation of ownership and control made functions of control the prerogative of an increasingly 'professionalised' management. Companies are managed by employees in a hierarchical pyramidal structure, at the apex of which, 'management' has to deliver a performance satisfactory to shareholder-owners. While senior management personify what might be called the 'collective capitalist', functions of supervision and control permeate the whole pyramid. Because of this, the productive functions of coordination of the division of labour (that is, of the 'collective worker'), while different from the unproductive functions of control, are also intertwined with them, so that administrative and supervisory hierarchies of the production process cannot be separated from technical hierarchies. Of course, technology is not some neutral specification upon which the capital relation is sociologically imposed; technological development is always shaped by the imperatives of capital. But this

does entail that administration, supervision and authority cannot usefully be separated. Consequently, to identify as ‘capitalists’ all those who perform the functions of supervision and control is to propose a very much wider definition than is commonly understood.

But abstract definitions of class are concerned primarily with structure (‘class-in-itself’) rather than agency (‘class-for-itself’), and are considerably removed from political and sociological concerns. To approach class and class structure in the latter sense requires that agency be more explicitly introduced. In particular, class location also depends crucially upon such issues as internalised identification. Those who supervise have to feel a class ‘belonging’, and, no less for capitalists than for workers, this is immediately a site of ideological struggle, whose stability is historically contingent. ‘Class’ is therefore a much more fluid and ambiguous category than abstract theory suggests. But the refinement of class categories to embrace such further issues is not pursued here.

#### 4.5 *The capitalist class share*

This wide definition of class makes unproductive labour a particularly complex category, since it comprises both working class and capitalist class components. One implication is that in a focus on distribution, it is not helpful to aggregate the wages of supervisory workers with those of production workers in unproductive sectors, for all that they are both financed out of the surplus labour time of productive workers. The common nomenclature of ‘wages’ to describe both the labour income of production workers and that of supervisory workers is misleading. If supervisory workers are the bearers of the capital relation, their labour earnings are a part of what accrues to the capitalist class, just as profits are. So equation (17) can be rewritten as

$$1 = \left( \frac{W_p}{MVA} + \frac{W_u(pn, u)}{MVA} \right) + \left( \frac{W(s)}{MVA} + \frac{\Pi}{MVA} \right) \quad (18)$$

Since in the first brackets on the right-hand side, the first term is the *VLP*, and the second term the approximately constant share in *MVA* of wages of production workers in unproductive sectors, the terms in the second brackets taken together are almost exactly inversely related to the *VLP*. The second brackets is the ‘capitalist class share’ and, by equation (13), reflects the rate of surplus value. Hence changes in the capitalist class share provide one indication of the changing balance of class forces, and are illustrated in Figure 7.

There was little change in trend in the capitalist class share for the 15 years after 1964; while there were fluctuations, the share was broadly constant until 1979 at around 51.3% (with a coefficient of variation of 1.25%). These years saw increasingly aggressive attempts by capital to alter the balance of power, but they were broadly successfully resisted. Despite significant ebbs and flows in the balance of class struggle, there was no clear winner. But the end of the 1970s saw significant changes.

Broadly, the working class failed to turn frustration with stagnation into a consensus in favour of state interventions on its behalf. Indeed, the opposite happened. The mid- to late 1970s saw increasingly effective anti-working class lobbying (by, for example, the Business Roundtable) in the political arena, a major victory being the decisive defeat of the Labor Law Reform Act of 1978. By the end of the 1970s, frustration with stagnation helped to produce the Reagan presidential victory in November 1980, ushering in an administration committed to a state-sponsored weakening of working class positions. Labour relations in the US had long been characterised by decentralised wage bargaining, little employment security, limited statutory provision of labour benefits, a highly supervised work environment and obstacles to union organising. Once this aggressive stance by capital in the



Fig. 7. *Capital's class share: profits and supervisory wages as a share of MVA, USA, 1964–2001.*

workplace was joined by a more aggressive capitalist state, there was a decisive shift in the balance of power towards capital.

An important marker of this shift was the union-breaking stance towards the air traffic controllers' union, early in the Reagan presidency. Equally significant were the more conservative appointees to the National Labor Relations Board, its decisions providing another index of the change in climate. As regards the adjudication of complaints against corporations of unfair labour practices, an average of 52% were upheld in 1984–85, compared with an average of 84% nine years earlier. Similarly, as regards complaints about corporate actions in union organising and elections, 35% were upheld in 1984–85, compared with 65% nine years earlier.<sup>1</sup> The success of this two-pronged attack on the organised working class, by state and by private capital, can be measured in terms of the proportion of wage and salaried workers covered by unions, which fell from 23.3% in 1983 to 14.8% in 2001, or, for the private sector alone, from 18.5% to 9.7%. The statistics for work stoppages and the percentage of estimated working time lost tell a similar story. As regards the unorganised working class, the collapse of the minimum wage in real terms from the late 1970s lowered the floor to wages. The minimum hourly wage rate as a percentage of the average hourly wage rate of production workers was a little under 50% through the 1970s; then from 47.7% in 1979 it fell to 34% in 1989, peaked at 41% in 1997 before falling to 36.9% in 2000. Further, the growth in 'contingent' (involuntary part-time, and temporary) employment pushed significantly larger numbers of workers towards this falling floor (Gordon, 1996, pp. 211–19, 223–34). Finally, a further indication of pressure is given by the percentage of males in prison as a percentage of male civilian employment, which more than trebled from 0.53% in 1980 to 1.72% in 2001.<sup>2</sup>

#### 4.6 *The roles of class struggle and technology in profitability changes*

One consequence of considering profits plus supervisory wages as the class share of capital is a sharper focus on the role of both class struggle and technology in the explanation of

<sup>1</sup> Figures cited by Gordon (1996, p. 210).

<sup>2</sup> The data are from Census Bureau (see Appendix: electronic data sources), Tables 351 and 589 (prison percentages), 644 (minimum wage), 655 (work stoppages), and 656 (unionisation).

changes in profitability. Consider then the rate of return to the capitalist class on the fixed capital stock. In a conventional sense, this is not a rate of profit that is meaningful, because the numerator is not the corporate income that accrues to the legal owners of the denominator. So the exercise is a purely hypothetical one. Its purpose is to focus on the difference between factor shares and class shares. This pre-tax expanded profit rate is illustrated in Figure 8, where the conventionally defined pre-tax profit rate from Figure 1 is also shown, both indexed to 1964. The two rates have a similar trend until the late 1970s. Thereafter, the conventionally defined profit squeeze by supervisory wages creates a significant difference, as it depresses the upswing of the conventionally defined rate. Finally, with profits replaced by capitalist class income, the decomposition of equation (1) can be applied. Figure 9 is the counterpart to Figure 2. But there are some interesting differences. The capitalist class share, and hence the rate of surplus value, was approximately constant until the trough of the profit rate in 1982. The stalemate in class struggle until the Reagan Presidency throws almost all of the determination of the decline in

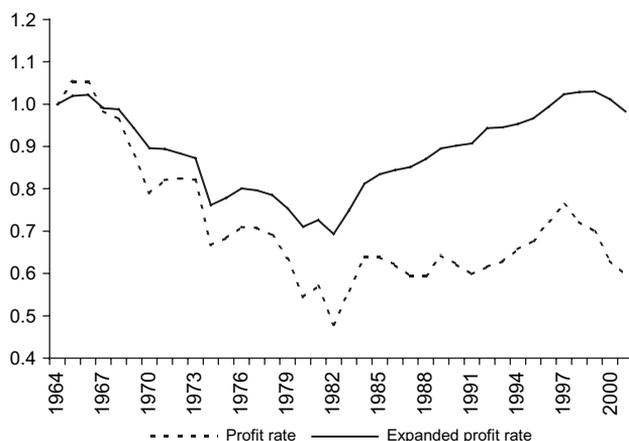


Fig. 8. Average pre-tax profit rates, USA, 1964–2001.

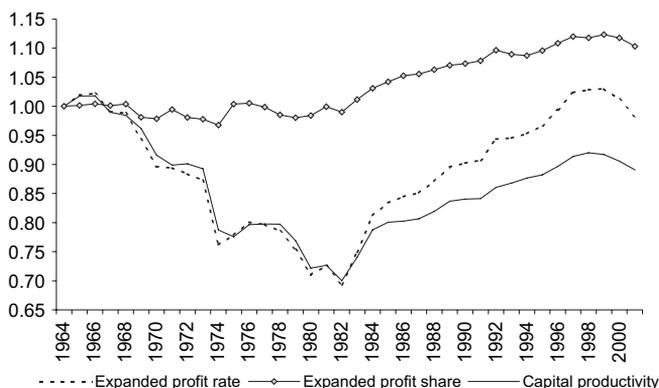


Fig. 9. Class profit rate, class profit share and capital productivity, pre-tax, USA, 1964–2001 (1964=1).

**Table 6.** *Decomposing the percentage points change in the profit rate*

|                           | 1965–82 | 1982–97 |
|---------------------------|---------|---------|
| % points change in:       |         |         |
| conventional profit rate  | –7.80   | 3.86    |
| conventional profit share | –4.10   | 1.66    |
| capital productivity      | –3.71   | 2.20    |
| % contributions of:       |         |         |
| conventional profit share | 52.53   | 42.96   |
| capital productivity      | 47.47   | 57.04   |
|                           | 1966–82 | 1982–99 |
| % points change in:       |         |         |
| expanded profit rate      | –7.81   | 8.01    |
| expanded profit share     | –0.29   | 2.56    |
| capital productivity      | –7.52   | 5.45    |
| % contributions of:       |         |         |
| expanded profit share     | 3.72    | 32.00   |
| capital productivity      | 96.28   | 68.00   |

profitability on to the falling productivity of capital. And in the upswing of the class rate of profit, the rising productivity of capital contributed just over two-thirds, and rising capitalist class income just under one-third.<sup>1</sup> Table 6 summarises.

The change in empirical perspective from a conventional factor shares approach to a class approach throws a particular light on the importance of the changing balance of class struggle and of movements in capital productivity in the explanation of ‘class profit rate’ changes. But it also highlights an important and unresolved problem. Why did the bearers of US capital take most of the surplus value extracted from productive labour as increases in their personal labour incomes rather than as increases in corporate profitability? Or, more conventionally, why did the growing gap between labour productivity and the real wage, illustrated in Figure 5, accrue predominantly to the labour incomes of supervisory workers rather than to profits? While ‘because they were supervisory’ rather than ‘because they were more skilled’ is the proximate answer of this paper, some further elaboration is clearly required.

## 5. Conclusion

This paper has attempted three tasks. First, it has presented a general theoretical framework within which issues of macroeconomic distribution from a surplus-based perspective can be considered. Second, it has described how this theoretical framework can be used empirically. And third, it has described the time trends that emerge from operationalising the theoretical framework, focusing on how the distinction between productive and unproductive labour bears on the class struggle between labour and capital.

<sup>1</sup> See fn. 1 on p. 348. Note that the peak dates in Table 6 are different.

These estimates provide further evidence that there has been a watershed in the macroeconomic history of the US, and that this watershed is structural in the sense that what followed was completely different from what preceded it. How it is dated depends upon the object of study. From the perspective of the relationship between real wage growth and productivity growth, it was around 1979. From the perspective of profit rate, profit share and capital productivity, the watershed was 1982. One area for further research is the extent to which the volatility of share produced by class struggle in the 1970s was an indication of the end of the ‘golden age’ of the post-war boom. Another is the extent to which the state has acted as proxy for capital, leading class struggle rather than reflecting it. Still another area of research is to explain the trends in capital productivity, for these account for about half of the movement in the conventional rate of profit, almost all of the downswing in the class rate of profit, and more than two thirds of its upswing. Further research is also required on the strange profits squeeze in the US economy. Why was the wage ratio in *MVA* of production workers in unproductive sectors broadly constant? Why did so little of the increase in money surplus value accrue to corporate profits and why so much to the labour incomes of supervisory workers?

One conclusion of this paper is that the distinction between productive and unproductive labour can be set within a general theoretical framework and operationalised empirically. A related conclusion is that it is essential to distinguish different categories of unproductive labour and their effects upon profitability, and that failure to do so generates misleading results. In general, the interaction between categories of productive and unproductive labour on the one hand, and class on the other is complex. The distinction between productive and unproductive labour concerns the creation of value, while the balance of class struggle can more generally be illustrated by considering the wages of production labour on the one hand, and those of supervisory labour together with profits. The precise mechanisms whereby each of these categories receives income requires further elaboration to account for the complexities of capitalism.

Paradoxically, a further conclusion of this paper is that for the empirical analysis of distributive shares, the productive unproductive labour distinction turns out not to matter. For the relative constancy of the wage share in *MVA* of production workers in unproductive sectors across the whole period implies that class shares can be considered directly without having to take account of the productive–unproductive labour distinction. Whether this is a temporally contingent result, a property confined to the US economy in the last third of the twentieth century, is also an important issue for further investigation.

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## Appendix A

### A.1 Electronic data sources

NIPA: Bureau of Economic Analysis, National Income and Product Accounts: <<http://www.bea.gov/bea/dn/nipaweb/SelectTable.asp?Selected=N>>

FAT: Bureau of Economic Analysis, Fixed Assets Tables: <<http://www.bea.gov/bea/dn/faweb/AllTables.asp>>

FoF: Federal Reserve, Flow of Funds Account: <<http://www.federalreserve.gov/releases/Z1/Current/data.htm>>

BLS: Bureau of Labor Statistics, National Employment, Hours and Earnings: <<http://data.bls.gov/labjava/outside.jsp?survey=ee>>

NBER: National Bureau for Economic Research: (<http://www.nber.org/cycles/cyclesmain.html>)

Census Bureau: Statistical Abstract of the United States 2003: <http://www.census.gov/prod/www/statistical-abstract-03.html>

Classification by industry is by the 1987 SIC for 1987–2001, and the 1972 SIC for 1964–87. At the level of aggregation at which data are employed in this paper, the effects of the change in SIC are insignificant. Note that the data do not include the 2003 comprehensive revision of the NIPA, and do not take account of the conversion of the estimates of income and employment by industry to the 1997 NAICS.

### A.2 *MVA and GDP*

To construct *MVA* out of *GDP* requires subtracting those flows of use-values evaluated in money terms which are not flows of money value added. These are the consumption of fixed capital, the activities of general government, and those flows of resource which are not matched by any monetary payment at all, but to which the NIPA impute a set of matching monetary flows (lines 172–8 of Table 8.21 in the NIPA). Care has to be taken not to exclude the consumption of fixed capital twice, and employment related imputations are multiplied by the ratio of total employee compensation, excluding general government employee compensation, to total employee compensation. A good case can be made for excluding all activities by private households and non-profit-making institutions, but because of the difficulties of identifying them in the data, they are included in *MVA* in this paper. In terms of orders of magnitude, *GDP* overestimates *MVA* by between 35.9% in 1965 and 52.1% in 1991. There is a clear increasing trend of overestimation until 1991, but not thereafter.

### A.3 *The pre-tax rate of profit*

The pre-tax rate of profit is the ratio of profit to the capital stock. Profit is *MVA* less total wages. The capital stock is the sum of net fixed assets and inventories. Net fixed assets are private fixed assets (excluding owneroccupied housing) at current replacement cost, and are from FAT, Table 3.1ES, adjusting for the stock of owner-occupied housing in Agriculture from Table 5.1, and adding in the stock of fixed assets in government enterprises from Table 7.1. Inventories are from FoF, Tables B102 and B103.

### A.4 *Productive labour*

#### A.4.1 *Benchmark estimates*

For numbers and wages, see Mohun (2005). The numbers and hours data explicitly include those for General government, but the wages data do not, because gross wages already include the value flows which, after tax, finance the wages of General government. Total hours are adjusted for self-employment by dividing by fte employees and multiplying by persons engaged in employment (NIPA Table 6.8) for every SIC division. This assumes that an average self-employed person works the same hours as an average FTE employee, which is doubtful. Self-employment is significant, being 13.7% of total employment in private industries in 1964 and 8.5% in 2001, and clustering in Agriculture, forestry and fisheries and Construction (78.0% in 1964 and 55.9% in 2001). Hence it is likely that total hours, and hence productive and unproductive components of total hours, are underestimated. For hours of productive labour, take the appropriate BLS average hours per week worked by relevant production workers, and

multiply by 52 and by the number of fte production workers for each SIC division defined as productive. Hours of unproductive labour are determined by subtraction of productive hours from total hours.

*A.4.2 Approximations*

A description of the procedures used to resolve the missing data in numbers, wages and hours is available from the author on request.