Cambridge Journal of Economics 1990, **14**, 1–27

Productive labour, price/value ratio and rate of surplus value: theoretical viewpoints and empirical evidence

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The purpose of this article is to contribute to the theoretical and methodological debate concerning the rate of surplus value and to provide new empirical evidence bearing on the US economy (from 1948 to 1987) and on EEC countries (Germany from 1960 to 1986, United Kingdom, France and an aggregate of seven EEC countries from 1970 to 1986).

The rate of surplus value (s*) can be expressed either as the ratio of total surplus value to total variable capital (S/V) or as the ratio of surplus value to the value of labour power per productive wage-earner. Symbolising the productive wage-earners' average labour time by t_v and the average value of their labour power by w_v,[1] we have:

$$s^* = (t_v/w_v) - 1 \tag{1}$$

We can estimate the value of labour power by dividing the money wage by the macro-economic 'price/value ratio' or 'monetary expression of values', which is the ratio of the sum total of prices to the sum total of values and is denoted by E. We thus have:

$$s^* = [t_v/(w_v/E)] - 1 \tag{2}$$

$$s^* = [E/(w_v/t_v)] - 1 \tag{3}$$

The rate of surplus value appears therefore as the ratio of E to the average hourly money wage of productive workers.

The three concepts of productive wage-earner, price/value ratio and rate of surplus value, as well as their empirical estimation, obviously depend on how the more basic concept of value is defined. Without reviewing the whole debate on the nature of value, the first section of the article puts forward my theoretical point of view on the subject.

The second section of the article is devoted to a close examination of E, which plays an important rôle in the approach adopted. We shall successively consider the links that the price/value ratio establishes between money magnitudes and labour magnitudes and the method used to estimate it.

Manuscript received 1 June 1987; final version received 23 January 1989.

*Department of Economics, University of Louvain-la-Neuve (Belgium). I am very grateful to Angelo Reati, Robert Leroy, Philippe de Villé, Michel De Vroey and three anonymous referees, all of whom made stimulating comments on an earlier draft of the paper. The responsibility for the final product, of course, is entirely my own. The basic statistical data on which the various tables and figures are based will be provided on request.

[1] Throughout the article, italic symbols refer to magnitudes expressed in hours of labour. The same symbols in plain type refer to the corresponding magnitudes expressed in money terms.

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Table 1. *A classification of labour and units of production according to the market character of production and labour power*

	Market production	Non-market production
Market labour power	(A) **Firms using waged labour** 1. Capitalist enterprises 2. Public enterprises 3. Non-profit enterprises (*Heteronomous labour, indirectly social labour*)	(C) **Publicly funded institutions** 1. Public 2. Private (*Heteronomous labour, directly social labour*)
Non-market labour power	(B) **Firms relying on self-employment** 1. Individual 2. Collective (*Heteronomous labour, indirectly social labour*)	(D) **Non-professional sphere** 1. Voluntary organisations 2. Households [*Autonomous labour,* (*social or private labour*)]

The third section is concerned with the rate of surplus value. We consider first two additional problems implied by the measurement of s*. We then make the link between formula (3) and measures based on national accounts data, and assess the exact rôle of E. We proceed to estimate the level and evolution of s* in the USA and EEC countries. We finally provide a method which aims to analyse the evolution of the factors affecting the rate of surplus value and apply it to the same countries.

1. Labour and the production of value

1.1. Labour in a capitalist society

The concepts of value and of productive labour adopted in the article flow directly from some basic conceptual distinctions between various types of labour existing in a capitalist society. Table 1 gives a breakdown of total labour according to the two essential criteria which define such a society, namely the *market* (or non-market) character of the goods and services produced and the *waged* (or non-waged) character of the labour provided.

Sections A and B comprise all the enterprises producing for the market. Whether capitalist or not, whether profit-oriented or not, they live from the sale of their products and are subject to the 'laws of the market'. It is the market sale which determines the socially useful character of the labour used in their production. If goods or services are sold, this is proof that the labour used in producing them is useful to others than the producers themselves. This gives the enterprises the revenues which enable them to survive and grow. On the other hand, if goods and services are not sold, it would appear that the labour put in by the producers is socially useless labour. Each enterprise thus faces the risk of automatic elimination through the mechanisms of the market and competition. We call all labour that has a social usefulness recognised indirectly and *a posteriori*, by means of the market, 'indirectly social labour'.

Section C, on the other hand, includes all 'directly social labour', i.e. all labour whose usefulness is recognised directly and *a priori* by a public authority, independently of a

market sale. The activities referred to produce collective non-marketed goods and services, which are in principle available free of charge to all citizens. These activities are financed, not through the sale of products, but through compulsory levies by public authorities. The public or private entities producing the goods or services in question do not face market uncertainties: if some activities disappear and others develop, it is not through market and competition mechanisms, but by virtue of political decisions on the part of public authorities, who take a variety of criteria into consideration (burden of cost, public interest and partisan considerations).

Sections A, B and C make up the professional sphere. Labour in this sphere is *heteronomous* labour, in the sense that its reproduction is subject to external decisions or norms: the 'market laws' for indirectly social labour, the public authorities' 'laws' for directly social labour.

The situation is very different in the non-professional sphere (section D), which consists of households and voluntary organisations. This sphere depends, in principle, on labour provided free of charge by the producers (members of households or organisations) and on voluntary financial contributions (subscriptions paid by the members, private grants to organisations). The labour carried out may be either social labour (useful to others than the producers) or private labour (useful to the producers only). It need not be validated by the market or by public authorities: in this sense, it is *autonomous* labour.

Table 1 tells us nothing about the nature of the goods and services or use-values which are produced. In fact, the same product, as defined by the nature of the use-value, can appear in different sections and even in all of them (consider for instance teaching and education).

It is worth making explicit here the two assumptions upon which the clear-cut distinctions set out in Table 1 depend. First, the table assumes that all labour performed in the professional area is professional labour, and that all labour performed in the non-professional area is labour provided free of charge. In reality, labour provided free of charge can be found at various points of the professional area: for instance, labour provided by family members in small enterprises, by servicemen in the army, by voluntary workers in hospitals, etc. Conversely, professional labour can be found within the non-professional sphere: this is the case of the waged members of voluntary organisations, who are engaged and paid with a view to supporting and enhancing the activities of the volunteers.[1] All these exceptions, however, do not affect the properties of labour provided in the respective spheres. Whether carried out to earn one's living or not, labour in the professional area is heteronomous labour, either indirectly or directly social labour. Whether provided free of charge or not, labour belonging to the non-professional area is autonomous labour, either private or social labour.

Second, Table 1 assumes that each unit of production has only one source of income or finance available to ensure its continuation: market enterprises live from the price paid by the customers; publicly funded institutions live from public financing, which implies compulsory levies; households—considered as production units rather than consumption units—rely only upon their members' free labour; and voluntary organisations live only from voluntary contributions (free labour, subscriptions, grants). Reality often differs from this scheme, as the same production unit may have several sources of incomes in

[1] The case of workers engaged by private households for child care, housework, etc. is different. These workers, who are not members of the households engaging them, actually belong to the professional sphere and provide indirectly social labour: despite the appearances of a waged relationship, they should be considered as independent producers selling services rather than labour power.

varying proportions.[1] As a result, it may be difficult, or even impossible, to draw a clear dividing line between the various types of activity, and in particular between market and non-market production (where should we locate a crèche which is financed half by the parents and half by the local authority?). For simplicity's sake, however, we will henceforth assume that all units of production clearly belong either to market or to non-market production.

1.2. Value as indirectly social labour

In their analysis of productive labour, Marx and most Marxist authors distinguish between commodity-producing activities on the one hand, and circulation and supervisory activities on the other.[2] Only production activities (in the market sector) are productive: they alone create commodities, value and revenue (and thus surplus value and surplus revenue where wage-earners are concerned). On the other hand, circulation and supervisory activities are unproductive: they do not create commodities, value, or revenue. As a consequence, the incomes earned in these activities, just like the wages earned in the sector of non-commodity production, involve deductions from the aggregate revenue created: this is the case for wages and profits of commercial and financial enterprises, and also for wages paid to employees involved in circulation and supervisory activities within productive enterprises.

The deductions required to finance circulation and supervisory activities, like those required to finance non-marketed collective goods and services, affect the rate of profit and potential for accumulation of the productive sectors. Insofar as the proportion of workers devoted to those activities increases, the capitalist system as a whole comes up against limits to its growth.

An alternative concept is adopted in this article. We define commodity, and thus productive labour, on the sole criterion of indirectly social labour.[3] If goods or services are sold, all labour carried out in any enterprise whatsoever counts as indirectly social labour and therefore contributes to the creation of commodities, of value and revenue (and thus of surplus value and surplus revenue if it is waged labour).[4] As far as value is concerned, the labour performed by foremen, book-keepers or sales agents in the car industry does not differ from that performed by workers directly involved in the technical process of car production: in both cases, it is labour performed on the initiative of the capitalist who engaged the wage-earners; in both cases, it is the sale of the cars which recognises this private labour as socially useful. Both types of labour are therefore *indirectly social labour* and count as value (and both must be considered as involved in the production of commodities).

The same can be said of labour performed in firms devoted to circulation activities. If this labour is recognised as socially useful through the sale of the circulation service (through the payment of a price for the commercial, financial, hiring or letting service

[1] Market enterprises may partly rely on public subsidies (railway companies for instance) or/and on members' subscriptions (football club), to say nothing of property rents (very important in the case of financial companies). Voluntary organisations may sell services to their members or to outside customers; they may also take advantage of public subsidies. Various publicly funded institutions require individual payments for services provided (education fees, registry office fees). And households' production might possibly benefit from public subsidies (housewife's allowance).

[2] See, for example, Moseley (1985, 1986).

[3] The argument summarised here is based on Hunt (1979) and De Vroey (1982).

[4] Note, however, that the happy few employees enjoying hourly wages higher than E create value, but no surplus value [see formula (3)].

rendered), it is just the same indirectly social labour and counts as value (and the circulation service must also be considered as a commodity).

Circulation and supervisory activities in the market sector, therefore, also constitute productive labour. They do contribute to the creation of the aggregate revenue of capitalist society. The development of such activities, in itself, involves no deductions from the aggregate revenue and no slowing down of the growth of the capitalist system. (If an excessive expansion of activities like trade and finance is prejudicial to the capitalist system, it is not because such activities could be unproductive but because *no* branch of activity can expand without taking account of the requirements of general interdependence.)

Following this line of reasoning, only labour carried out in the non-professional sphere and that devoted to the production of non-marketed collective goods or services are *unproductive* labour. In these two cases, there is indeed no question of commodity production, or of indirectly social labour or of value. This alternative approach breaks with the traditional Marxist view that circulation services are not commodities and that circulation labour is not productive of value. But it has the twofold advantage, first of ensuring a perfect coherence between the three concepts of indirectly social labour, value and commodity, and second of making these three concepts completely independent of the specific content (or use-value) of the activities. The only criterion which remains relevant is whether the activities are indirectly social labour or not.

A further observation must be made here. The hours of present labour devoted to producing commodities count fully as value and productive labour only if all the commodities produced are actually sold. If a proportion of the commodities is not sold, a corresponding proportion of the labour performed does *not* count as value and productive labour. This constitutes the difference between value defined as 'indirectly social labour' and value defined as 'embodied labour'. For simplicity's sake, I will henceforth assume that all the commodities produced are actually sold and that all the hours of present labour devoted to their production therefore count as value and productive labour.

1.3. The quantity of value created

It is commonly accepted that skilled labour ('complex labour') creates more value (is more productive) than labour without special skills ('simple labour'):[1] hence the problem of reducing units of complex labour into units of simple labour. In the same way, it is commonly accepted that more intensive labour creates more value than less intensive labour:[2] hence a similar problem of reducing different kinds of labour of varying intensity to a common standard. The difficulties of solving these problems at an empirical level are such that measuring quantities of value (not of concrete labour) appears to be impossible.

Differences in skills and intensity, however, should not prevent us from measuring values in terms of the number of hours actually worked, both on the macro-level and on micro-levels.

A first argument that could be put forward is that the unit of measure of abstract labour, of value, is the hour of labour performed by an 'average' worker, by the labourer working with the average degree of skill and intensity. This being so, the quantity of value created

[1] Marx briefly mentions the distinction between simple labour and complex labour (*Capital*, volume I, end of ch. VII) but does not go deeper into it and abandons it altogether in the rest of *Capital*. The distinction, however, does not cease breeding theoretical debates, as appears for instance in a recent article by Harvey (1985).

[2] It is also the viewpoint adopted by Marx (*Capital*, Volume I, ch. XV and ch. XVII).

by each individual worker's hour of labour would differ according to the deviation of his/her specific skill and intensity from the mean: those with a higher (lower) than average skill and intensity would create more (less) value in one hour. But the sum of values created by all the workers taken together would be equal to the total number of hours actually worked.

A second and more radical argument is that, as far as value creation is concerned, one hour of labour is always equal to another hour of labour: differences in skill and intensity, just like differences in technique and productivity, affect the distribution of the total revenue created and thus the quantity of revenue obtained, but do not affect the quantity of value produced.

Let us take the example of a branch of production which consists of various firms using different techniques and suppose that each firm employs 100 wage-earners working eight hours a day. In each firm 800 hours of value are created per day. But the more advanced firms, with higher productivity and with individual unit values lower than the social unit value, will benefit from a transfer of surplus revenue from the marginal firms where individual unit values are higher than the average.[1]

In the same way, the more skilled and intensive labour in a particular firm has the effect of reducing the unit individual value of the commodities produced there, which brings about a redistribution of the total surplus revenue: the capitalist employing this type of labour obtains a profit higher than the surplus revenue created by his wage-earners, at the expense of his less efficient competitors. But the more mechanised, skilled and intensive labour does not create more value (or more surplus value) than the more manual, less skilled and less intensive labour. In all cases, providing the commodities produced are actually sold, each hour of labour counts as one hour of indirectly social labour, as one hour of value.

1.4. An estimation of productive labour and of value created

Table A1 in the Appendix shows the evolution of the number of productive workers, of their annual labour time, and of the sum total of value created by them in the USA (1948–87), Germany (1966–84), the UK and France (1966/72–84). The appendix also explains the exact method used to estimate the relevant variables.

It appears from Table A1 that the share of unproductive labour in total professional employment increased fairly steadily in the three EEC countries from 1966 to 1984, while it was practically stable in the USA from 1969 to 1987 (it increased there during the period 1948–69). The share of independent labour in total productive labour declined in the four countries until 1978 (or 1981), but remained fairly stable or even increased afterwards. The sum total of value created increased fairly steadily in the USA, remained practically constant in the UK, and clearly decreased in Germany and France.

2. The link between labour magnitudes and money magnitudes: the 'price/value ratio' (E)

2.1. General principles

The value of every commodity (the abstract labour devoted to producing a commodity actually sold) is necessarily expressed as a certain *price* (a certain number of monetary

[1] The term *surplus revenue* refers to surplus value expressed in monetary terms: what is transferred (redistributed) is revenue and surplus revenue, not value or surplus value. The example ignores the possible differences in the composition of capital and in market power, so that market price = simple price = unit social value × E. For a systematic and complete analysis of the different kinds of *transfers of surplus revenue*, see Gouverneur (1983, chs 6–7 and 1987, chs 5–6). On the concept of individual value, see below (page 8, n. 1).

Table 2. *The links between labour concepts and money concepts*

	All commodities	Each particular commodity			
Levels of analysis:	Whole economy	Firm	Industrial branch		
Expression in hours of labour	Σ values	Unit individual value	Unit social value	(Labour-equivalent of price of production)	(Labour-equivalent of market price)
Expression in prices	Σ prices	(Money equivalent of unit individual value)	↓ Simple price	→ Price of production	→ Market price

units). This being so, there must always exist, in every market society, a certain relation between the sum total of *prices* (in monetary units) and the sum total of *values* (in hours of abstract labour). This quantitative relation between the sum total of prices and the sum total of values is called the 'price/value ratio' or the 'monetary expression of values' and is symbolised by E:[1]

$$E = \Sigma\text{prices}/\Sigma\text{values}$$

The price/value ratio is a macroeconomic magnitude. There is one E at the level of each national economy, and only one.

As the sum total of prices constitutes the aggregate monetary revenue of a market society, E can also be considered as the quantitative relation between the sum total of monetary revenues and the sum total of values.

$$E = \Sigma \text{ prices}/\Sigma \text{ values} = \Sigma \text{ revenues}/\Sigma \text{ values} \qquad (4)$$

The quantitative relation E therefore represents two things simultaneously:

(1) Considering the ratio Σprices/Σvalues, it gives the translation of one hour of value into *simple price*.

(2) Considering the ratio Σrevenues/Σvalues, it represents the quantity of monetary revenue created per hour of value, per hour devoted to the production of commodities. (At the level of a firm or of a branch, the revenue created per hour of value normally differs from the hourly income—wage plus profit—obtained, for various transfers of revenue take place due to differences in productivity, organic composition of capital and market power.)

Given E at the macro-level, it is possible to establish, for any particular commodity, various theoretical links between values and prices, or more generally between labour

[1] This concept was introduced at approximately the same time by Gouverneur (1975, p. 64) and Aglietta (1976, p. 31). It has been hardly elicited in Marxist economic theory. Some authors consider the inverse relation between the sum total of values and the sum total of prices: this is the case of Mage (1963), who calculates the 'labour contents of the price unit', and of Foley (1986), who uses the ambiguous term of the 'value of money'.

concepts and money concepts. These are summarised in Table 2. Unit individual values are the quantities of labour time required in each individual firm to produce one unit of a commodity under specific conditions of technique, skill and intensity.[1] Unit social value is the labour time required to produce one unit of the same commodity under the average conditions of technique, skill and intensity prevalent at the time: it is the weighted average of all unit individual values.[2] The transition from unit social values to market prices takes the three well-known stages indicated by the arrows. The first stage is the expression of values in *simple prices*.[3] These are theoretical prices which correspond exactly to the value of commodities: simple price = unit social value × E. The second stage is the transformation of simple prices into *prices of production* within the framework of a capitalist society where the composition of capital varies between industries. Prices of production, like simple prices, are theoretical prices and cannot be directly observed. The third stage is the transition to actual *market prices*, which differ from prices of production according to imbalances between supply and demand and/or according to differences in market power between industries. For each of the price concepts distinguished, there is a specific corresponding concept in labour terms, with the link between the two types of concepts being established through the mediation of E.

At the *empirical* level, the only magnitude which can be observed is the actual market price. Empirical research will therefore only be able to carry out the transition from market prices to their equivalent in hours of labour, but it will never be able to arrive at the actual value of commodities. (It is only for reasons of simplicity and brevity that I will later systematically replace the concept of 'labour-equivalent of actual prices' by that of 'value'.) This limitation does not matter very much when one considers the evolution of a variable (value of a commodity, value of labour power, rate of surplus labour, etc.). In fact, if it is true that there is always some divergence between market price and simple price—and therefore between 'labour-equivalent of market price' and 'value'—the essential point is that the two magnitudes always evolve in the same direction, falling as productivity increases.[4]

It is worth noting that dividing the price of any commodity (or group of commodities) by E gives an adequate measure of total productivity in real terms for the commodity(ies) concerned. Statistical series of real productivity are usually obtained by dividing, by an appropriate price index, the money 'value added' per worker or per hour of labour: such statistics express the changes in productivity per worker or per hour of present labour. The price/E ratios, on the other hand, express the number of hours of past and present labour necessary to produce one unit of the commodity considered: they make it possible to obtain a fairly accurate picture of the growth of total real productivity.[5]

[1] The concept of individual value may appear contradictory: is value not 'social' in essence? Value (or abstract labour) is actually indirectly social labour. The latter is performed both at the level of the firm and at the level of the industry: at both levels, the only condition for labour to be recognised as value is that the product is actually sold.

[2] The relations between individual values and social value are examined by Marx in *Capital*, volume 3, chapter x.

[3] The concept of simple price originates in Bullock and Yaffe (1975). A synonymous concept is that of direct price used by Shaikh (1977).

[4] Ochoa (1984, 1987, and also 1986, pp. 113–14) has shown that simple prices, prices of production and market prices are remarkably close to one another in the postwar US economy. Values are by far the quantitatively dominant factors in the formation of market prices.

[5] Measures of *total* real productivity are convincingly advocated by Ochoa (1986), who presents a procedure based on input-output data. His method, apart from the problem of the small number of years for which the necessary data are available, is much more complex than simply calculating price/E ratios. It would be interesting to compare Ochoa's results with those derived from calculating these simple ratios.

2.2. Estimating E

The denominator and the numerator of E can be understood in two different ways: either the sum total of total values (including the past values transferred) and the sum total of gross prices or revenues (including the cost of the means of production used); or the sum total of new values (excluding the past values) and the sum total of net prices or revenues (having deducted the cost of the means of production). Provided that the means of production are estimated at current rather than historic values and prices, the two methods of calculation are in theory equivalent.[1] In practice, since past values cannot be the object of any direct observation, the most convenient method consists in calculating E in 'net' terms:[2]

$$E = \Sigma \text{ net values}/\Sigma \text{ new values} = \Sigma \text{ net revenues}/\Sigma \text{ new values} \quad (5)$$

Prices and values in formulae (4) and (5) obviously refer to commodities, i.e. to goods and services created in the market sector. The same is true for revenues: the numerator refers to the revenues created in the market sector and excludes the incomes earned in the non-market sector, since the latter are paid out of the former.

The denominator of E is the number of hours of productive labour in the wider sense, i.e. of labour producing value. It is not restricted to (waged) labour which creates surplus value, but comprises all labour (waged or not) which creates value. This is because E establishes the link between the price aspect and the value aspect of all commodities in general, irrespective of whether they are produced by independent (self-employed) workers or by wage-earners (in capitalist firms, in public enterprises, in non-profit enterprises, etc.).

We thus get

$$E = (R/L_p t_p) = R/(L_v t_v + L_i t_i) \quad (6)$$

where R represents the net revenue created in the market sector, L_p the number of productive workers, t_p the labour-time per productive worker, the subscripts v and i referring to productive waged and independent workers respectively.

Formula (6) can also be written in the following form:

$$E = (NDP - L_u w_u)/(L_v t_v + L_i t_i) \quad (7)$$

where NDP = net domestic product at market prices, L_u = number of unproductive wage-earners (i.e. wage-earners in the non-market sector) and w_u = wage-cost per unproductive wage-earner.

The NDP gives us the sum total of incomes in the whole economy (before taxes and contributions to National Insurance). Subtracting $L_u w_u$, we *approximate* the monetary revenue *created* in the economy. Two comments must be made on this point:

(1) In the National Accounts, the incomes of the non-market sector (i.e. the cost of non-commodity products) are added to the incomes of the market sector (i.e. the price of commodities). Such an addition is justified if one wants to record all goods and services produced in an economy. (To achieve this, it would even be necessary to impute a price or income to *all* non-commodity products, including those of the non-professional area: national accounting makes such an imputation in a very limited number of cases, like that

[1] See Gouverneur (1983, pp. 242–3).

[2] Mage (1963, pp. 214, 218–19) calculates the 'labour-content of the current dollar' (= 1/E) in gross terms, through a highly complex procedure. Using Mage's data to calculate it in net terms, very simply yields estimates which are practically equivalent to his (the difference amounts to 1 to 6%, except in 1933).

of houses occupied by their owner.) The calculation of E, however, aims at establishing the link between the amount of revenue created and the amount of value created. Now value and revenue are only created in the sector of commodity production: the sector of non-commodity production does not create any value, and the incomes earned in it are deducted from the revenue created in the market sector. Not deducing the wage-cost of the 'non-market' wage-earners and taking account of the figure of the net domestic product alone (as I used to do myself: Gouverneur, 1978, 1983, 1987) leads to a double counting which unduly inflates the amount of revenue created.

(2) Just as the denominator of formula (7) aims to measure the value created in a given economy, the numerator should in theory measure the revenue created in the economy (or the sum total of net simple prices of commodities). For this aggregate revenue created (or the sum total of net simple prices) constitutes the exact translation, in money terms, of the value created. But the statistics are necessarily registered in terms of market prices and of incomes *obtained*. Now market prices differ from simple prices, and incomes obtained differ from the revenue created, each time there is a transfer of revenue. The statistics on each country's aggregate output or income thus cannot but amalgamate the revenue created in one country and the revenue transferred from one country to another. As a result, there is a risk of 'distortion' in the estimation of E: this distortion may be significant if the international transfers of revenue are themselves significant and if they are made systematically in favour or to the detriment of certain countries.

Table A2 in the Appendix shows the calculation of E in the USA (1948–87), Germany (1966–84), UK and France (1972–84). It also compares its evolution to that of the consumer price index, which will be used in the next section for the calculation of the average value of the means of subsistence.

3. Measuring rates of surplus value

3.1. Additional problems related to the measurement of rates of surplus value

The measure of the rate of surplus value is obviously dependent on the theoretical stands adopted concerning productive labour and its value creating capacity. My viewpoints on these issues have already been presented in the first part of the article.[1] Two additional problems, however, must be briefly considered here.

The nature of labour power and the relations between value of labour power and the money wage. Is it theoretically defensible to derive the value of labour power from the money wage, as is implied by formula (2), where w is replaced by w/E? Or should one *a priori* define the workers' necessities of life and the value of their labour power?

[1] Considering that, from the point of view of value *creation*, one hour of labour is always equivalent to another hour of labour (whatever their respective degrees of mechanisation, skill and intensity), I shall add two brief observations related to the 'production of absolute surplus value'. First, if one takes the view that increasing labour intensity is equivalent to lengthening labour time, one should similarly consider that making use of higher skills also leads to a 'production of absolute surplus value'. (In the three cases, it must of course be assumed that the value of labour power is given or does not rise proportionately.) Second, I consider that only a prolongation of labour time brings about a 'production of absolute surplus value' (or surplus labour). An increase in the intensity or skill of labour cannot be put on the same footing as a lengthening of labour time. Such an increase rather constitutes one of the ways of increasing productivity (and so of reducing value) and should be treated in the same way: if it is widespread, it reduces the value of labour-power and brings about a 'production of relative surplus value'; if it is limited to one firm or to one branch of industry, it brings about transfers of surplus revenue to the benefit of that firm or branch.

The overwhelming majority of authors adopt Marx's viewpoint and consider labour power as a commodity. Just as the price of a commodity is the monetary expression of its value, the wage is defined as the monetary expression of the value of labour power. Thus, from a theoretical point of view, just as the determination of the price of a commodity implies the prior determination of its value, the determination of the monetary wage implies the prior determination of the value of labour power and, therefore, the *a priori* definition of a (historically determined) bundle of wage-goods considered as 'necessary for the reproduction of labour power'.

This commodity conception of labour power, however, is questionable. For labour power, though being sold, is not produced in the same way as an industrial product. Labour power should rather be considered as a *natural resource*, a gift of nature, which is maintained in existence through the consumption of a variety of goods and services (either domestic products, or free collective goods and services, or commodities).[1] The price of this natural resource is independent of any value defined *a priori*. Actually, the wage level (for wage-earners in general and for any particular group among them) depends on the balance of forces between workers and capitalists, which in turn depends on such factors as the extent of unemployment, the firms' profitability, the degree of organisation of the working class, the political power of the capitalist class, etc. Given the price level of the consumption goods and services, the monetary wage in turn determines the bundle of goods and services the worker can buy, or his/her real wage.

To sum up: in the usual conception of labour power as a commodity, the 'value of labour power' and the 'necessities of life' must theoretically be defined *a priori* and cannot be inferred from the wage and price levels; in the heterodox conception of labour power as a natural resource, the 'value of labour power' and the real wage must theoretically be derived from the wage and price levels and the 'value of labour power' (or 'labour equivalent of actual wage') can be estimated through E.[2]

Which concept of wage? In the preceding discussions no distinction has been made between net wage (actually obtained by the worker), gross wage (including the worker's income tax and National Insurance contributions) and wage-cost (including the employer's National Insurance contributions). Two lines of reasoning lead me to adopt the concept of wage-cost as relevant to the measurement of the value of labour power and the rate of surplus labour.

First, consider the function of the wage from the workers' point of view. Abstracting from domestic products, the workers depend on their wage to have access to consumption goods. The function of the wage is thus to give the workers access to their means of existence. In the hypothetical case in which all the means of existence are commodities, the wage permits the purchasing of these commodities: this purchasing, in turn, enables the production of commodity means of existence to continue and evidently enables the workers to consume them. However, in so far as part of the means of existence consist of

[1] See De Vroey (1985). Not being a commodity, labour power, strictly speaking, has *no value*. By continuing to use the concept of 'value of labour power', I simply conform to the current but mistaken usage, which focuses on the sale of labour power and overlooks the fact that labour power is not produced like a commodity.

[2] One referee suggested to me that the 'labour equivalent of actual wage' seemed similar to Smith's concept of 'labour commanded'. I see the analogy and difference as follows. Smith's 'labour commanded' is obtained through dividing the price of a commodity by the wage, let us say the hourly wage: it thus gives the number of hours (of present labour) that a wage-earner must perform in order to get the commodity in question. The 'labour equivalent of actual wage', on the other hand, is obtained by dividing the wage, not by the price of a commodity, but by E. It gives the number of hours (past and present) necessary to produce the wage earner's means of existence, i.e. some sort of 'labour commanded' by the wage (but in a sense different from above).

non-marketed *collective goods and services*, the wage must also allow the workers to take part in the *financing* of these 'non-commodity' means of existence; this financing enables the collective goods and services to be produced by the state and then consumed by citizens, workers and capitalists alike. (Whether the wage-earners' share in the financing of collective goods and services corresponds to their share in the consumption of them is another question.) The wages paid by the capitalists have therefore to permit, on the one hand, the purchasing of the wage-earners' individual means of subsistence and, on the other, the financing of the collective means of subsistence the wage-earners consume. The wage which fulfils this two-fold function is the *wage-cost*, including the worker's income tax as well as both National Insurance contributions (which contribute to the formation of an indirect and socialised wage).

Second, consider wages from the *capitalists'* viewpoint. The wage that is considered as variable capital is the *total sum of money spent* on purchasing labour power, irrespective of how this total sum of money is divided into cash income for workers, income tax for the state or National Insurance contributions.

3.2. An estimation of the rate of surplus value

Method of calculation. Substituting (7) into (3), we get

$$s^* = (NDP - L_u w_u)/[(L_v t_v + L_i t_i)(w_v/t_v)] - 1$$
$$s^* = (NDP - L_u w_u)/[L_v w_v + L_i(w_v t_i/t_v)] - 1 \qquad (8)$$

The term $L_v w_v$ gives the total amount of variable capital, while $L_i(w_v t_i/t_v)$ can be considered as the sum total of wages imputed to independent workers, assuming that the latter enjoy the same hourly income as productive wage-earners but taking into account their specific labour time.

Formula (8) shows that the macroeconomic rate of surplus value can be estimated without calculating E specifically. It can be directly approximated through a profit/wage ratio referring to the whole market sector (including trade and finance, and making due allowances for the 'wages' of independent workers).

It remains necessary to calculate E, however, for two reasons. First, to estimate rates of surplus value or of surplus labour at 'microeconomic' levels, or more specifically at levels other than the whole market sector. For example, to calculate the rate of surplus value of a specific category of productive workers (or even of an individual worker) and the rate of surplus labour of unproductive wage-earners (which it is also in the capitalists' interests to maximise): in these cases, the only possible method of calculation consists of relating E to the hourly money wage of the workers considered, as indicated by formula (3). It should also be used to estimate the rate of surplus value in a particular firm, branch or sector, including the whole 'non-financial business sector': the existence of transfers of surplus revenue between firms, branches and sectors gives rise to differences between profit and surplus revenue; calculating a profit/wage ratio is therefore a theoretically inadequate procedure compared to the procedure given by formula (3).[1] Second, to estimate the

[1] Amsden (1981) provides an international comparison of rates of surplus value at industry level based on census data in money terms. Disregarding her (standard) distinction between productive and unproductive labour, her procedure is questionable on the ground that it implicitly assumes that revenue created and incomes obtained are equal *at industry level*, thereby ignoring all types of transfers of surplus revenue (due to differences in productivity, organic composition of capital and market power) both within individual countries and between them. Weisskopf (1979) uses the profit share in the non-financial corporate business sector (NFCB) of the US economy as a proxy for the rate of surplus value. The true proxy for the macroeconomic s*, however, is the ratio of profit to wages in the business sector as a whole.

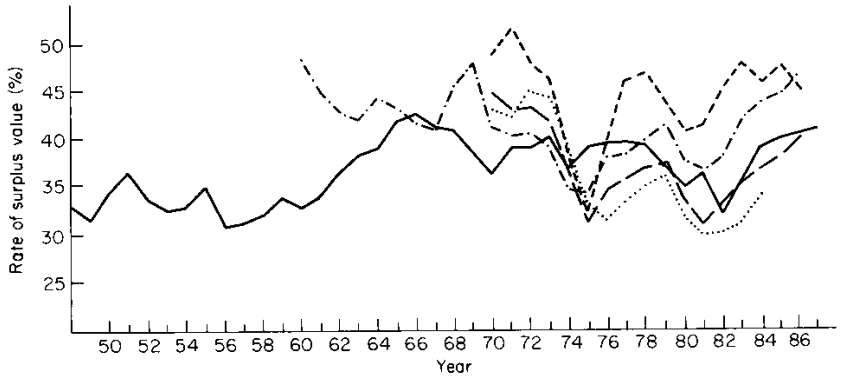

Fig. 1. *The rate of surplus value in the USA (1948–87) and in EEC countries (1960/70–1986). – – –, UK; – · – · –, Germany; ———, USA; — — —, EEC-7; · · ·, France.*

Table 3. *The rate of surplus value in the USA and EEC countries (1960–1986) (selected years)*

	1960	1966	1971	1975	1981	1986	Average 1970–1986
Germany	48	42	40	34	37	47	40
United Kingdom	—	—	52	32	42	46	45
France	—	—	43	32[a]	30	34[b]	36[c]
EEC—7 countries*	—	—	43	32	32	40	37
USA	33	43	39	37[d]	32[e]	41	38

[a]1976.
[b]1984.
[c]Average 1970–84.
[d]1974.
[e]1982.
*Germany, United Kingdom, France, Netherlands, Belgium, Denmark, Italy.

evolution of the average value per wage-good [$p_x = p_x/E$, see (9) below] which affects the rate of surplus value. This will be done presently.

Results. Figure 1 and Table 3 show the levels of and changes in the rate of surplus value in the countries considered. As far as levels are concerned, s* appears to be very similar in all of them: the average figures for the period 1971–86 range from 36% (France) to 45% (UK). Assuming the same 8-hour working day everywhere, these figures would imply that the daily surplus labour per productive wage-earner ranges from 2 h 10 min to 2 h 30 min.

The general tendencies of the rate of surplus value appear to be fairly similar in most cases. Leaving aside the sharp drop in the European countries (but not in the USA) during the 1974–75 crisis, there is a clear tendency for s* to decline in all the countries during the seventies, more precisely from 1970 to 1981 (from 1971 to 1982 in the USA). The available data show that this decline starts from the very beginning of the sixties in Germany, and

from the mid-sixties in the USA (where it follows an upward trend covering the period 1956–66). The trend is reversed during the eighties: s* rises rapidly everywhere; in the USA and Germany, it is nearly as high at the end of the period as in the peak years of the sixties.

3.3. An empirical analysis of the factors affecting the evolution of the rate of surplus value
Method of analysis. The terms w_v in (1) and w_v/E in (2) can be broken down in order to show the two influences bearing on the value of labour power, i.e. the number of wage-goods or real wage and the average value per wage-good.

The annual real wage (x) depends on the annual money wage (w_v) and the average price per wage-good (p_x). We have: $x = w_v/p_x$.

On the other hand, the average value per wage-good can be estimated, as can the value of any commodity, by dividing the price by the price/value ratio. In symbols: $p_x = p_x/E$.

One thus gets:

$$s^* = (t_v/xp_x) - 1 = \{t_v/[(w_v/p_x)(p_x/E)]\} - 1 \tag{9}$$

The series relating to the average price of the necessities of life (p_x) necessarily take the form of indices, in practice, the consumer price indices. The same applies to the series relating to x and p_x, which are estimated from p_x. For this reason all the data in this section are expressed as indices.

Before considering the results of the calculations, it is worth adding a methodological observation. The rate of surplus value of formula (9) can also be expressed in the following way:

$$s^* = [(1/p_x)/(x/t_v)] - 1 \tag{10}$$

Here the denominator represents the hourly real wage. The numerator represents the reciprocal of the average value per wage-good: it therefore represents the number of wage-goods produced per hour of labour (present and past), that is, hourly real productivity in all the branches that contribute to the production of wage-goods. This formula suggests that one can study the evolution of the rate of surplus value by comparing statistical series which describe the evolution of real wages and real productivity. The statistics for real productivity, however, are usually obtained by dividing, by an appropriate price index, the money 'value added' per worker (or per hour of labour) in industry. These statistics have two defects: first, they only deal with industrial productivity, while a growing number of the necessities of life are produced in the services sector; second, they only express at best the productivity per hour of present labour. The calculation of $p_x = p_x/E$ avoids both defects: the consumer price index (p_x) covers services as well as industrial products; and $1/p_x$ expresses the productivity per hour of past and present labour in the production of these goods and services.[1]

Results. Figure 2 depicts year by year how the rate of surplus value and its constituent elements moved in the USA from 1948 to 1987. Table 4 gives the annual rates of change of all the variables for selected periods and subperiods.

[1] The relation between changes in real wages and changes in real productivity have been analysed in a remarkable way by Phelps Brown and Hopkins (1981) from a historical perspective. As these authors do not aim to analyse changes in rates of surplus value, they cannot be blamed for measuring real productivity simply using output/worker ratios. Among the few researchers who explicitly relate the evolution of the Marxist ratios to that of real wages and total labour productivity, E. Wolff (1986, 1987) deserves special mention. His procedure, however, requires input-output data which are published only for certain years; and it does not explicitly consider the evolution of labour time.

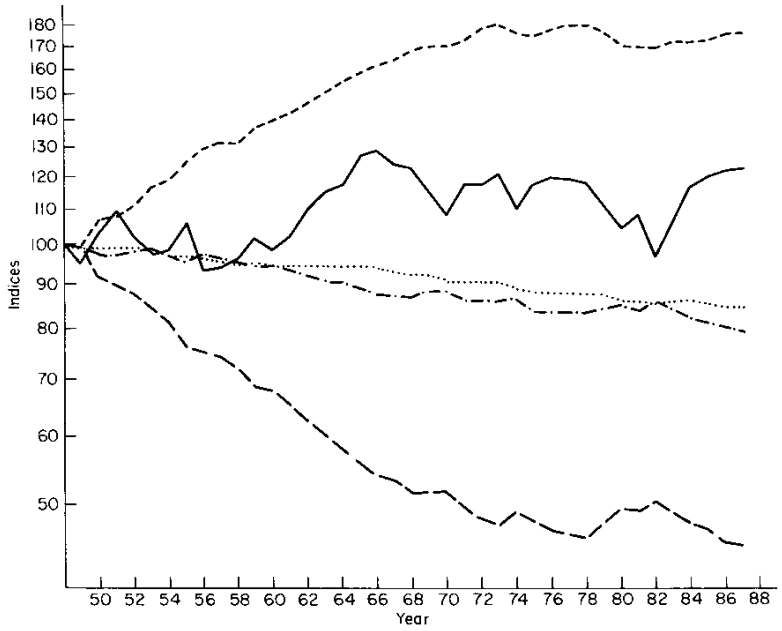

Fig. 2. *Evolution of the rate of surplus value and of its constituent elements in the USA (1948–87; 1948 = 100).* – – –, Real wage (x); ———, rate of surplus value (s*); · · ·, labour-time (t_v); – · – · –, value of labour-power (w_v); — — —, value per wage-good (p_x).

Table 4. *Rate of change of the rate of surplus value and its constituent elements in the USA (1948–87) (selected periods)*

	Labour-time	Real wage	Value per wage-good	Value of labour power	Rate of surplus value
1948–56	−0·41	+3·33	−3·47	0·26	0·81
1956–68	−0·34	+2·21	−3·08	−0·93	+2·32
1948–68	−0·37	+2·65	−3·23	−0·67	+1·06
1968–78	−0·52	+0·76	−1·15	−0·39	−0·39
1978–82	−0·58	−1·53	+2·29	+0·76	−4·92
1982–87	−0·14	+0·81	−2·23	−1·44	+4·94
1968–87	−0·43	+0·28	−0·72	−0·43	+0·00
1948–87	−0·40	+1·49	−2·00	−0·55	+0·54

If one compares the two extreme years, the following changes can be observed. Labour time has decreased by 15% and the real wage has increased by 78%. These are the most visible and best-known aspects of what is called 'the improvement of workers' conditions'. Something less visible and less widely known is that in the same period, the growth of productivity has had the effect of reducing the average value of the means of existence by more than half. The result is that the value of labour power has decreased by 20%. Since

this reduction in the value of labour power is greater than the reduction in labour time, the rate of surplus value is higher in 1987 than in 1948 (by 24%).

If one considers the development of the variables between the two extreme years, 1968 shows a clear inflexion point in productivity growth, as reflected in the evolution of the value per wage-good: the latter declines at an annual rate of 3·23% between 1948 and 1968, but of only 0·72% afterwards. Considering the same periods 1948–68 and 1968–87 for the other variables, it appears that the rate of increase of the real wage also slows down considerably (+2·65% and +0·28% respectively), while the rate of surplus value ceases to increase during the second period taken as a whole.

The period 1948–68 can be divided in two sub-periods. From 1948 to 1956, the rate of increase of the real wage is higher than that of productivity, and s* tends to decline. From 1956 to 1968, productivity and the real wage already show lower rates of increase, but productivity now grows faster than the real wage, and s* increases sharply.

Within the period 1968–87, the last two sub-periods deserve special attention. Between 1978 and 1982, both productivity and the real wage decline substantially; the former declines even more than the latter, so that the value of labour power rises and s* goes down sharply. The picture is completely different since 1982: productivity and the real wage rise again, with a much more substantial increase in the former than in the latter: the result is that the value of labour power declines, and the rate of surplus value increases, at unprecedented rates. One may wonder whether this new pace of productivity, the real wage and the surplus value is only a short-term episode or whether it shows the end of the 'structural crisis' of the seventies and the beginning of a long-term tendency comparable to that which prevailed in the fifties and sixties. The question cannot yet be settled, but the sluggish increase in the real wage at least suggests that US capitalism as not so far really entered a new 'golden age'.

Figure 3 shows how the rate of surplus value and its constituent elements have changed in the USA and the three main EEC countries during the period from the late sixties (early seventies for UK and France) to the mid eighties.[1] The most striking feature is that productivity increases are much more important in Europe than in the USA: taking 1972 as a common base (= 100), the value per wage-good in 1984 is practically the same in the USA (p_x=99), while it is reduced by 17% in the UK, 28% in Germany and 33% in France; comparing 1984 to 1966, the value per wage-good is reduced by more than half in Germany (p_x falls from 147 to 72) and by only 12% in the USA (p_x declines from 112 to 99). The evolution of real wages show a similar contrast: x stagnates in the USA, whilst it increases markedly in the three European countries (though at a slower pace since 1978). The value of labour power and labour time show similar downward tendencies in the USA and Germany. Labour time remains practically unchanged in the UK; in France, it decreases steadily and much more than the value of labour power, which results in a significant decline in the rate of surplus value.

Conclusions

From a theoretical perspective, I have adopted 'unorthodox' viewpoints on three problems: the skill-and-intensity of labour has been regarded as irrelevant as far as value creation is concerned; labour power has been considered as a natural resource rather than a factory commodity; and productive labour has been defined in the extended sense of indirectly social labour, which includes circulation and supervisory labour as well. These

[1] As explained in the Appendix, data on annual labour time in EEC countries are available every three years only. As a result E, and therefore the value per wage-good and the value of labour power, cannot be estimated year by year like the real wage and the rate of surplus value.

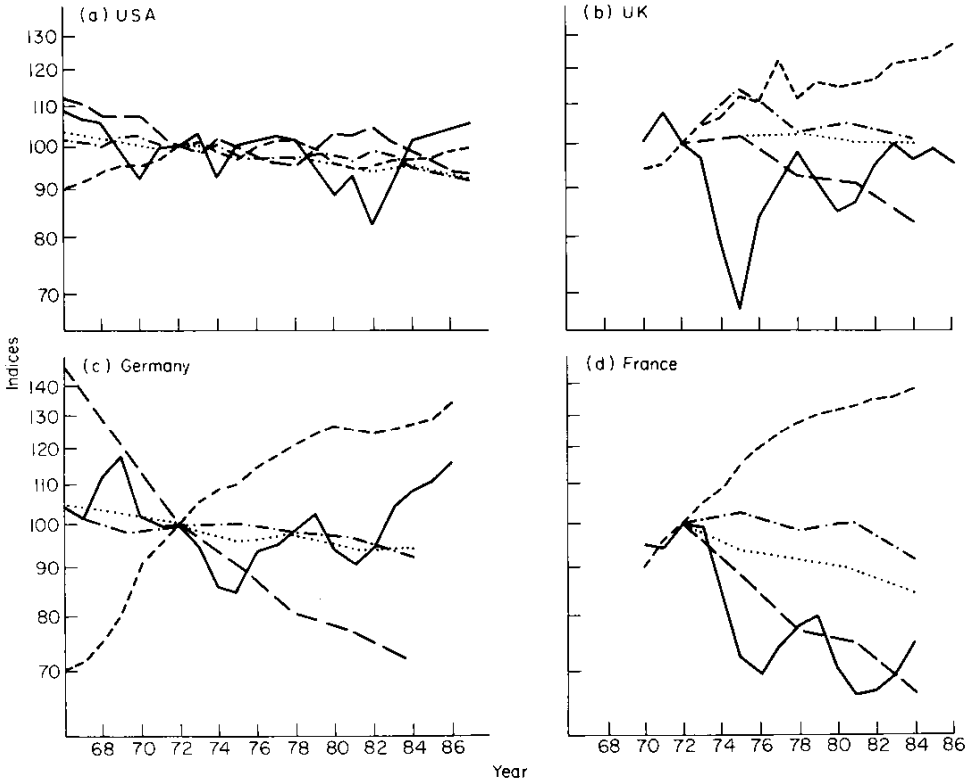

Fig. 3. *Evolution of the rate of surplus value and of its constituent elements in the USA, UK, Germany and France (1972 = 100).* – – –, Real wage (x); ———, rate of surplus value (s*); · · ·, labour-time (t_v); – · – · –, value of labour-power (w_v); — — —, value per wage-good (p_x).

viewpoints are not only defensible on purely theoretical grounds, but have the additional advantage of ensuring a much easier link between theory and empirical research. However, a perfect match seems beyond reach, if one takes into account the distorting effect of international transfers of revenue. This problem actually affects all money magnitudes and therefore *all* procedures measuring rates of surplus value.

As far as method is concerned, the calculation of E makes it possible to provide theoretically correct estimates of the rate of surplus value (or of surplus labour) at any level one may wish to consider; it also allows us to study the evolution of one of the key variables affecting s*, namely total labour productivity in the wage-good sector.

The procedure used to estimate E and s* and to analyse the factors affecting the latter is incomparably easier to handle than any other measure of the rate of surplus value I know. It is based on the knowledge of a very limited number of annual variables [see formulae (8) and (9)]. Except for the labour time provided by independent workers, all these variables are readily available or can be calculated—or at least approximated—very easily (see Appendix).

At the empirical level, I have not tried to analyse how my estimates of the rate of surplus value compare to those provided by other researchers. Table 5, which refers to the

Table 5. *A comparison between various estimates of the rate of surplus value in the postwar US economy*

	Mage	Shaikh	Wolff	Moseley	Gouverneur
1948	0·37	1·26	0·96[a]	1·35	0·33
1958	0·29	1·30	1·01	1·59	0·32
1967	—	1·45	1·08	1·73	0·41
1976	—	—	0·75	1·68	0·40
1985	—	—	—	1·98	0·40
Average 48–60	0·31	1·29	0·99	1·49	0·33
Average 61–72	—	1·42	0·98	1·70	0·39
Average 73–85	—	—	—	1·76	0·38

[a]1947.
Sources: Mage (1963, p. 175), Moseley (1986, p. 183, and 1987, p. 394) and Wolff (1986, p. 95).

US economy, simply illustrates how differences in the theoretical and methodological approach may result in very different estimates. Considering the period 1948–60, for instance, it is striking to observe that Moseley's figures are about five times as high as Mage's and mine. (The close correspondence between Mage's figures and mine is all the more unexpected since our interpretation of productive labour and our methodological approaches are very different.) A systematic comparison of all these estimates, such as that outlined in Moseley (1986), falls beyond the scope of this article and should be carried out in future research.

Nor have I tried to test any Marxian 'law' concerning the rate of surplus value. The only relevant long-term 'laws' that can be put forward are the following: (1) labour productivity necessarily increases in all branches of production; (2) this results, among other things, in a necessary decline in the value per wage-good; and (3), it also results in a necessary rise in the real wage. The evidence provided in this article obviously confirms the second and third 'laws'. But the exact rise in the real wage, as well as the changes in labour time, depend on the overall balance of forces between wage-earners and capitalists, which cannot be determined *a priori*. The changes in the real wage and in labour time may offset the decline in the value per wage-good, but they do not necessarily do so. The result is that it seems impossible to make any prediction on the long-term evolution of the rate of surplus value. (The same conclusion would apply to the composition of capital and the rate of profit.)

The evidence provided also shows clearly that the rise in worker's living standards is perfectly compatible with a stable or even increasing degree of exploitation of the wage-earning class. Substantial increases in total labour productivity—as reflected in the evolution of the average value of the means of subsistence—make it possible to raise real wages substantially without jeopardising the rate of surplus value. On the other hand, a slowing down of the increase in total labour productivity, such as that experienced by the US economy since the late sixties, raises a challenge to the capitalist system: the more slowly productivity grows, the more difficult it is to reconcile the material aspirations of the workers and the class interests of the capitalists.

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Appendix

A. Sources and methods

The basic data used to calculate E and s* [formulae (7) and (8)] and to analyse the influences bearing on s* [formula (9)] were collected from the following sources.

(1) Net domestic product (NDP). For the USA: National Income and Product Accounts (NIPA), Table 1.12. For EEC countries: Statistical Office of the European Communities (EUROSTAT), data bank for macroeconomic series (CRONOS).

(2) Productive and unproductive wage-earners: numbers (L_v *and* L_u) *and total compensation* (L_vw_v *and* L_uw_u). Given my definition of productive labour, all the wage-earners are considered as being productive, except those employed in 'non-market services' (who are unproductive wage-earners) and those employed by 'private households' (whom I consider as independent producers: see p. 3, n. 1).

USA: in collaboration with the US Department of Commerce, EUROSTAT introduces US data in its sectoral data bank (SDB). The two institutions calculate the volume of employment and the sum total of compensations in the 'non-market services' through the following addition of NIPA's items in Table 6.6 (full-time and part-time employees by industry) and Table 6.4 (compensation of employees by industry): 20% of 'electricity, gas and sanitary services' (line 49), 30% of 'business services' (line 63), 50% of 'health services' (line 68), 80% of 'educational services' (line 70), 20% of 'social services and membership organisations' (line 71), 100% of 'government and government enterprises' (line 76). Identical percentages are applied each year. I have used the same procedure to calculate L_u and L_uw_u, except for one correction: employees of 'government enterprises' (lines 81 and 86) have been considered as productive rather than unproductive wage-earners and have been subtracted from line 76. The magnitudes L_v and L_vw_v are then obtained as follows: employees in 'private industries' (line 3), less unproductive wage-earners, less employees in 'private households' (line 75).

EEC countries: EUROSTAT, sectoral data bank (SDB), provides the employment and compensation figures for all wage-earners (full-time and part-time) and for those employed in 'non-market services' (employees in public enterprises are included in market production). L_v and L_vw_v are obtained through subtracting the figures for 'non-market services' from the overall figures. For lack of detailed data, it has not been possible to subtract employees in private households: the latter remain included in L_v and L_vw_v.

(3) Wage-cost per productive wage-earner (w_v): is obtained from the estimated L_v and L_vw_v above.

(4) Number of independent workers (L_i). USA: L_i = number of self-employed (NIPA, Table 6.9, line 1) + number of employees in private households (NIPA, Table 6.6, line 75).

EEC countries: L_i = total employment − total number of wage-earners in employment (EUROSTAT, SDB). [It has not been possible to add the employees in private households. The fact that the latter are included in L_v rather than L_i leads to a slight underestimation of E and s* insofar as $t_i > t_v$: see formulae (7) and (8).]

(5) Labour-time per productive wage-earner (t_v). USA: t_v is estimated through dividing the 'hours worked by full-time and part-time employees' in private industries (NIPA, table 6.11, line 3) by the corresponding number of full-time and part-time employees (NIPA, table 6.6, line 3).

EEC countries: the 'surveys of labour costs in industry', carried out by EUROSTAT in member countries every three years from 1966 to 1984, provide the annual labour time per wage-earner in industry. Owing to the fragmentary and contradictory nature of the information on waged labour time in services, I have assumed that the data on waged labour time in industry could be applied to all wage-earners in the market sector. *Sources:* EUROSTAT, 'Surveys of labour cost in industry', in *Social Statistics*, 4/1969 and 6/1970 (for the 1966 survey), 3/1971 (for the 1969 survey), *Employment and unemployment* 1987, p. 226 for the surveys from 1972 to 1984 (the latest survey was carried out in 1988).

(6) Labour-time per independent worker (t_i). For the USA: in the absence of relevant data to my knowledge, I have estimated $t_i = t_v \times 130\%$ as for the EEC countries.

EEC countries: the 'labour force sample surveys', carried out by EUROSTAT every two years since 1970, give a comparison of the weekly labour time provided by waged and non-waged workers during *one reference week*. It appears that the weekly labour time per non-waged worker is always

higher, and that the percentage difference is fairly constant in each country: about +26% in France, +30% in Germany, +34% in the United Kingdom. I have considered an average of 30% and used this percentage to estimate the *annual* labour time of independent workers in each country.

(7) Consumer price index (p_x). Source for all countries: IMF, *International Financial Statistics*.

B. Data tables

Tables A1, A2 and A3 give the relevant data at 6-yearly intervals between 1948 and 1966 for the USA, at 3-yearly intervals for all countries from 1966 onwards. These 3-yearly intervals correspond to EUROSTAT's 'surveys of labour costs', which provide the annual labour time needed to calculate E, p_x and w. Some other basic data (L_v, L_j, $L_u w_u$), however, are not available in EUROSTAT's sectoral data bank (SDB) for France and/or UK before 1970.

Table A1. *Productive labour and value created*

	Total (professional) employment, L, 10^6 (1)	Unproductive employees, L_u, 10^6 (2)	Productive employees, L_v, 10^6 (3)	Independent workers, L_i, 10^6 (4)	Productive workers, L_p, 10^6 (5)=(3)+(4)	L_u/L, % (6)	L_i/L_p, % (7)	Annual labour time per L_v, t_v, h (8)	Annual labour time per L_i, t_i, h (9)	Σ value created, 10^9 h (10)
USA										
1948	61·6	8·3	41·3	12·1	53·4	13·4	22·7	1·980	2·574	112·8
1954	66·9	11·7	43·9	11·3	55·3	17·4	20·5	1·914	2·488	112·3
1960	71·3	13·1	47·3	10·9	58·1	18·3	18·7	1·884	2·449	115·6
1966	81·0	16·9	54·3	9·8	64·1	20·8	15·3	1·873	2·435	125·6
1969	81·3	19·0	58·8	9·5	68·3	21·8	13·9	1·833	2·383	130·4
1972	89·1	19·6	60·1	9·4	69·6	21·9	13·6	1·806	2·348	130·8
1975	92·9	21·0	62·5	9·4	71·9	22·6	13·1	1·754	2·280	131·0
1978	103·3	22·2	71·0	10·0	81·0	21·5	12·4	1·743	2·266	146·5
1981	108·0	23·5	74·1	10·4	84·5	21·8	12·3	1·711	2·224	149·9
1984	112·7	24·5	77·2	11·0	88·2	21·7	12·5	1·723	2·240	157·7
1987	120·4	26·2	83·0	11·2	94·3	21·8	11·9	1·691	2·198	165·0
Germany										
1966	26·7	3·3	18·3	5·0	23·3	12·5	21·6	1·883	2·448	46·8
1969	26·2	3·5	18·1	4·6	22·7	13·4	20·3	1·850	2·405	44·6
1972	26·7	3·9	18·6	4·1	22·7	14·8	18·1	1·799	2·339	43·1
1975	25·7	4·3	17·7	3·8	21·5	16·7	17·7	1·721	2·237	38·9
1978	25·6	4·5	17·7	3·4	21·2	17·5	16·2	1·759	2·287	39·0
1981	26·1	4·8	18·0	3·3	21·3	18·3	15·4	1·685	2·191	37·6
1984	25·3	4·9	17·1	3·3	20·4	19·5	16·0	1·692	2·200	36·1

Table A1. (*Continued*)

	Total (professional) employment, L, 10^6 (1)	Unproductive employees, L_u, 10^6 (2)	Productive employees, L_v, 10^6 (3)	Independent workers, L_i, 10^6 (4)	Productive workers, L_p, 10^6 (5)=(3)+(4)	L_u/L, % (6)	L_i/L_p, % (7)	Annual labour time per L_v, t_v, h (8)	Annual labour time per L_i, t_i, h (9)	Σ value created, 10^9 h (10)
UK										
1966	25·2	4·4	—	—	20·8	17·5	—	—	—	—
1969	24·7	4·4	—	—	20·3	18·0	—	—	—	—
1972	24·3	4·5	18·1	1·8	19·8	18·5	8·9	1·878	2·441	38·2
1975	24·9	5·0	18·1	1·7	19·9	20·0	8·8	1·915	2·490	39·1
1978	24·8	5·0	18·2	1·7	19·8	20·0	8·4	1·928	2·506	39·2
1981	24·4	5·1	17·3	2·1	19·4	20·1	10·8	1·885	2·451	37·7
1984	23·8	5·1	16·3	2·4	18·8	21·2	12·9	1·880	2·444	36·7
France										
1966	20·3	3·9	—	—	16·4	19·2	—	2·089	2·716	—
1969	20·6	4·1	—	—	16·5	20·1	—	2·023	2·630	—
1972	21·0	4·3	12·7	4·0	16·7	20·6	23·7	1·985	2·581	35·5
1975	21·2	4·5	13·0	3·7	16·7	21·4	21·9	1·860	2·418	33·1
1978	21·6	4·8	13·4	3·5	16·9	22·0	20·9	1·818	2·363	32·6
1981	21·7	4·9	13·3	3·5	16·9	22·4	21·0	1·771	2·302	31·7
1984	21·5	5·2	12·9	3·4	16·3	24·1	20·7	1·682	2·187	29·1

Table A2. *Price/value ratio and rate of surplus value*

	Net domestic product, NDP (11)	Compensation to unprod. employees, $L_u w_u$ (12)	Revenue created, R (13)=(11)−(12)	Price/value ratio		Consumer price index	Wage-cost per productive employee		Rate of surplus value, s*
				E (14)=(13)/(10)	E(1972=100) (15)	p_x(1972=100) (16)	yearly w_v (17)	hourly w_v/t_v (18)=(17)/(8)	(19)=[(14)/(18)]−1
USA	10^9	10^9	10^9	$ per h			10^3	$ per h	%
1948	240	21	219	1·94	28	57	2·89	1·46	33·2
1954	338	37	301	2·68	38	64	3·86	2·02	32·8
1960	465	55	410	3·55	50	71	5·03	2·67	32·8
1966	704	91	613	4·88	69	78	6·40	3·42	42·8
1969	876	127	749	5·74	81	88	7·61	4·15	38·4
1972	1094	171	923	7·06	100	100	9·16	5·07	39·1
1975	1419	228	1191	9·09	129	129	11·46	6·53	39·2
1978	1989	298	1691	11·54	164	156	14·43	8·28	39·4
1981	2653	405	2248	15·00	213	217	18·83	11·00	36·3
1984	3309	511	2798	17·75	252	248	21·96	12·74	39·3
1987	4017	633	3384	20·51	291	272	24·59	14·54	41·0
Germany	$DM10^9$	$DM10^9$	$DM10^9$	DM per h			$DM10^3$	DM per h	%
1966	441	46	395	8·43	56	83	11·20	5·95	41·7
1969	539	59	480	10·77	72	87	13·47	7·28	47·9
1972	738	91	647	15·01	100	100	19·21	10·68	40·5
1975	911	134	777	19·98	133	121	25·58	14·86	34·4
1978	1142	161	981	25·12	167	135	31·54	17·93	40·1
1981	1352	199	1153	30·69	204	157	37·81	22·44	36·8
1984	1534	218	1316	36·44	243	175	42·84	25·32	43·9

Table A2. (*Continued*)

	Net domestic product, NDP (11)	Compensation to unprod. employees, $L_u w_u$ (12)	Revenue created, R (13)=(11)−(12)	Price/value ratio		Consumer price index p_x(1972=100) (16)	Wage-cost per productive employee		Rate of surplus value, s* (19)=[(14)/(18)]−1
				E (14)=(13)/(10)	E(1972=100) (15)		yearly w_v (17)	hourly w_v/t_v (18)=(17)/(8)	
UK	£10^9	£10^9	£10^9	£ per h			£10^3	£ per h	%
1966	35	4	31	—	—	71	—	—	—
1969	43	5	37	—	—	80	—	—	—
1972	58	8	49	1·29	100	100	1·64	0·87	48·1
1975	94	16	78	2·00	154	157	2·89	1·51	32·4
1978	149	22	126	3·22	249	230	4·22	2·19	47·1
1981	222	37	185	4·90	379	344	6·53	3·46	41·6
1984	280	46	234	6·39	494	410	8·23	4·38	46·1
France	FF10^9	FF10^9	FF10^9	FF per h			FF10^3	FF per h	%
1966	472	—	—	—	—	74	—	—	—
1969	636	—	—	—	—	85	—	—	—
1972	888	118	770	21·68	100	100	29·61	14·92	45·3
1975	1295	195	1099	33·23	153	136	46·56	25·03	32·7
1978	1938	305	1633	50·05	231	178	67·23	36·98	35·3
1981	2786	462	2324	73·21	338	254	99·86	56·39	29·9
1984	3842	660	3182	109·24	504	335	137·23	81·59	33·9

Table A3. *The constituent elements of the rate of surplus value (1972 = 100)*

	Labour time per prod. employee, $\bar{t}_v$ (20) [from (8)]	Wage-cost per prod. employee, w_v (21) [from (17)]	Real wage per prod. employee, x (22) = (21)/(16)	Value per wage-good, $\bar{p}_x$ (23) = (16)/(15)	Value of labour power, $\bar{w}$ (24) = (22) × (23)	Rate of surplus value, s^* (25) [from (19)]
USA						
1948	110	32	55	207	115	85
1954	106	42	66	169	111	84
1960	104	55	78	141	109	84
1966	104	70	90	112	101	109
1969	101	83	95	108	102	98
1972	100	100	100	100	100	100
1975	97	125	97	100	97	100
1978	97	158	101	95	96	101
1981	95	206	95	102	97	93
1984	95	240	97	99	95	101
1987	94	268	99	93	92	105
Germany						
1966	105	58	70	147	104	103
1969	103	70	81	121	98	118
1972	100	100	100	100	100	100
1975	96	133	110	91	100	85
1978	98	164	122	80	98	99
1981	94	197	125	77	96	91
1984	94	223	128	72	92	108

Table A3. (*Continued*)

	Labour time per prod. employee, $\overline{l}_v$ (20) [from (8)]	Wage-cost per prod. employee, w_v (21) [from (17)]	Real wage per prod. employee, x (22) = (21)/(16)	Value per wage-good, $\overline{p}_x$ (23) = (16)/(15)	Value of labour power, $\overline{w}$ (24) = (22) × (23)	Rate of surplus value, s^* (25) [from (19)]
UK						
1966	—	—	—	—	—	—
1969	—	—	—	—	—	—
1972	100	100	100	100	100	100
1975	102	176	112	102	114	67
1978	103	257	112	92	103	98
1981	100	398	115	91	105	86
1984	100	501	122	83	101	96
France						
1966	105	—	—	—	—	—
1969	102	—	—	—	—	—
1972	100	100	100	100	100	100
1975	94	157	115	89	103	72
1978	92	227	127	77	98	78
1981	89	337	133	75	100	66
1984	85	463	139	66	92	75