SURPLUS-VALUE AND AGGREGATE CONCENTRATION IN THE UK ECONOMY, 1987-2009

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Abstract

This paper examines the movements in the Marxian surplus-value rate using a Quantitative Marxist methodology. It examines the relationship between surplus-value and the degree of monopoly power in the UK economy using quarterly data and a proxy for aggregate concentration ⎯ the ratio of market capitalisation in FTSE100 firms to market capitalisation in FTSE All Share firms. Two other forces are considered: (i) the size of the "reserve army" of the unemployed; (ii) working class militancy. Our results suggest that increases in the "reserve army" influence the surplus-value rate positively, and that working class militancy is negatively related to changes in the surplus-value rate, indicating that strike action in this period is largely a defensive measure by workers. Finally, our data suggests that rising aggregate concentration (when measured by market capitalisation) exerts a profound, significant and positive effect on the rate of surplus-value.

Keywords: Surplus-value, Monopoly Capital, Aggregate Concentration

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1. Introduction

According to Mandel: 'Marx … considered the discovery of the concept of surplus-value, representing the sum total of profits, interests and rents of all parts of the bourgeois class, as his main theoretical discovery' (1976, p.51). Its role was important for two primary reasons: (i) positively, surplus-value and the level of the organic composition of capital (OCC) define Marx's rate of profit; *ceteris paribus*, a rising OCC generates a tendency for the rate of profit to fall, ultimately leading to the demise of capitalism; (ii) surplus-value plays a normative role in Marx's theory, connected as it was to his theory of exploitation. Although there have been theoretical and empirical problems with these principles, to be discussed presently, it is clear that the rate of surplus-value has a central role in Marxian economics.

The first of these insights — the (methodologically) positive claim that the theory of surplus-value and the OCC explain capitalist crisis — faces a historical problem. In spite of some Marxian predictions to the contrary it is a matter of empirical fact that capitalism has endured and expanded in the second half of the twentieth century. Events such as the Great Depression (1929-32), and the more recent global financial crisis, suggest that capitalism is periodically troubled, but ongoing systematic expansion — manifest in the emerging BRIC economies of Brazil, Russia, India and China — cast doubt over the hypothesis that Capitalism's end is inevitable in the foreseeable future. There are many explanations for the failure of a falling rate of profit (FRP) crisis to materialise. Some have proposed that orthodox Marxian theory, on which the falling rate is based, is flawed because of underlying problems in the formulation of value, and differences between value and money rates of profit (Steedman, 1977). Since capitalists are motivated by maximising money profits

consideration of value rates are irrelevant. This critique is also connected to the claim that capitalism is exploitative, the latter referring to a situation where an individual, group or class, works longer than is necessary to produce the equivalent of what they consume. Of course, the claim that capitalism is exploitative is one of the foundations of Marxian economics and radical political economy.[2] However, work in the last half-century has suggested that (*contra* Marx) the rate of surplus-value is not necessarily equal to the rate of exploitation, though capitalist exploitation is a necessary condition for the existence of positive profits (see Morishima, 1973, Roemer, 1981). Since the present paper adopts an empirical macroeconomic approach it is not our intention to dwell on these issues, save to note that we endorse the Fundamental Marxian Theorem, and will calculate the rate of surplus-value using nominal values.[3]

Orthodox Marxian economists have offered explanations as to why the FRP has not materialised, in the sense of causing a fundamental crisis of capitalism. In Marx's original work various factors — e.g. more intense exploitation of labour, the impact of foreign trade, and the increase in share capital — offset this underlying tendency (1981, pp.339-348). Value-theoretic problems notwithstanding this would be consistent with the contemporary expansion of capitalism into the BRIC economies, and rising share capital associated with big business.

In the 1960s and 1970s a second strand of radical thinking, which had its roots in Lenin's theory of imperialism, also began to influence the New Left. Led by Baran & Sweezy (1966), this approach attributed the success of capitalism (in terms of maintaining and *increasing* profits) to growing concentration in industry, leading to increasing monopoly power, thereby generating a tendency for surplus to rise.[4] In

common with Marx they view capitalism as crisis-prone, but the notion of surplus employed, and the mechanism whereby crisis is generated, is different from that of Marx. Whereas Baran & Sweezy locate crisis in underconsumption emanating from an inability of capitalist society to absorb surplus, the latter formulation is based on surplus-value production and a trajectory in the rate of profit driven by the OCC.

Empirical evidence, however, began to suggest that growing concentration of control of the means of production was no longer the trend in the UK economy: indeed, de-concentration characterised UK industrial production in the 1980s (Henley, 1991). Others have suggested that Baran & Sweezy overstated the degree to which modern corporations could influence prices and profit margins: 'Mere size does not give monopoly power, in view of the multi-product character of most huge enterprises' (Howard & King, 1992, p.123). It is in this context that we will explore the relationship between corporate profits, aggregate concentration and class conflict in the contemporary the UK economy.

The present paper begins by estimating the level of surplus-value (as opposed to Baran & Sweezy's "surplus") in the UK economy, using quarterly data 1987-2009. Among the forces which it is hypothesised drive such changes, three have been selected as elements in our study: working class militancy (measured by aggregate strike days), growth in the "reserve army" of the unemployed, and changes in aggregate concentration measured by the ratio of market capitalisation of FTSE100 firms to market capitalisation of FTSE All Share firms. Increasing surplus-value, which measures changes in class-based distribution of income in the capitalist sector, is hypothesised to be positively related to rising aggregate concentration and

unemployment, and negatively related to working class militancy (measured through strike action). In examining these hypotheses the paper is structured as follows: in Section 2 we offer a macroeconomic model of surplus-value and estimate its rate for the UK economy; in Section 3 we shall review the literature on market concentration and profits, before defining (and calculating) the measure of aggregate concentration to be used in our statistical analysis; in Section 4 we outline the Quantitative Marxist methodology adopted, and apply OLS regression to explain changes in the rate of exploitation as a function of the variables selected (including changing aggregate concentration). In concluding we argue that monopolising tendencies are an important dynamic in driving changes in the distribution of income, and there exists an important statistical relationship between changing aggregate concentration and changes in the Marxian surplus-value rate (in the period investigated). Secondly, the expanding or contracting nature of the reserve army of the unemployed also influences the changing rate of surplus-value, though strike activity is of limited importance (in terms of statistical significance and size of the coefficient). Finally, we reflect on the methods we have used, claiming that Quantitative Marxism can make a valuable contribution to our understanding of contemporary society.

2. Surplus-Value and Market Structure

There have been a number of significant attempts to measure Marxian categories and their determinants (Weisskopf, 1979, Moseley, 1985, 1988, Gouverneur, 1990, Shaikh & Tonak, 1994, Duménil, 2002). Of particular note is the work of Gouverneur (1990), who estimated the rate of surplus-value (hereafter s') for Germany, the UK, France and the US over the period 1960-1986. At the outset of his analysis he points to two ways of measuring the rate of surplus-value: (i) in terms of the ratio of total

surplus-value to total variable capital (which is the measure we adopt); and, (ii) as the ratio of surplus-value to the value of labour power per productive wage earner (which is the method Gouverneur uses). The latter approach allows the researcher to decompose changes in the rate of surplus-value into its constituent elements (e.g. absolute and relative surplus-value production); however, since this is not central to the present paper we will use the former method, expressing s' in terms of total surplus-value and total variable capital.

In order to define surplus-value, and illustrate the potential implications of monopoly power, let us take a simplified capitalist macroeconomy. Commodities are used as inputs and combined with labour to produce outputs. Assume that the gross value of aggregate output (P) is given by the sum of unit prices of commodities (the $1 \times n$ vector $\mathbf{p}$) multiplied by their gross output (the $n \times 1$ vector $\mathbf{y}$), i.e. $P = \mathbf{py}$. The $n \times 1$ vector of produced commodity inputs (analogous to the circulating elements of constant capital in Marx's system) required to produce the vector of gross outputs is given by $\mathbf{x}$. And, the aggregate money wage in the capitalist economy (W), which is equivalent to aggregate variable capital, is spent on subsistence goods (given by the $n \times 1$ vector $\mathbf{b}$) multiplied by the vector of prices. That is $W = \mathbf{pb}$. In such a system the gross value of aggregate capitalist output is determined by the costs of production, to which a rate of profit (r) is added. This gives us the following macroeconomic model of the capitalist macroeconomy:

$$P = \mathbf{py} = (1+r)(\mathbf{px} + \mathbf{pb}) \tag{1}$$

By multiplying the elements of the right-hand side of (1) we can derive aggregate profits, $R = r(\mathbf{px} + \mathbf{pb})$. This is analogous to total surplus-value in a Marxian sense,

6

while variable capital advanced in such a macroeconomy is equal to aggregate wages of those employed in the capitalist sector. We therefore define s' thus:

$$s' = \frac{R}{W} = \frac{r(\mathbf{px} + \mathbf{pb})}{\mathbf{pb}} \tag{2}$$

The role of growing concentration of control of the means of production in such a system is twofold. First, if monopoly power is growing producers would be able to charge above-competitive prices. The link between money wages and the subsistence vector is important in the case of rising monopoly power and associated price rises. If, for a given aggregate money wage level, prices of consumption goods increase (through, for example, rising monopoly power), the subsistence goods workers can purchase will fall. In other words, in equation (2), if $W = \mathbf{pb}$ then rising prices implies falling workers' consumption. The rising prices raise the numerator of s' while the denominator remains unchanged, thus shifting the distribution of income away from workers in favour of capitalist.

Secondly, rising concentration *vis-à-vis* the means of production may also entail growing monopsony power by capitalist firms over the workforce. This will be accentuated if worker cohesion is diminishing, for example as a consequence of legislation aimed at curbing the power of trade unions. The "price effect" of high seller concentration is likely to be picked up in cross-sectional analyses of particular industries (see the discussion of the market concentration doctrine in Section 3, below); however the "cost effect" *vis-à-vis* wage impacts on the labour market and macroeconomy as a whole, which can be driven by conglomerates, is likely to be spread through the economy as a whole.

In estimating s' there are further theoretical considerations which relate to the productive-unproductive labour distinction. In the model outlined above we are assuming that the economy is capitalist, i.e. profits are generated from all labour employed by capital in the system (since r**pb** is a part of profit in equations 1 and 2). However, we need to be clear that the model in equations (1) and (2) is for the capitalist macroeconomy only: in estimating s' we only consider the wages of labour directly involved in capitalist production, i.e. we exclude public sector wages and the self-employed (or "mixed" income).[5] In some sense we are treating public sector workers as "unproductive", though non-market workers would perhaps be a more satisfactory description. Moseley (1985) goes further: in estimating s' for the US economy he argues that certain categories of worker employed by capitalists — e.g. those working as managers or accountants — do not produce surplus-value, and thus their wages should be deducted from variable capital. In the presence of such workers this entails that the level of s' will be revised up through the method of calculation. However, while we accept the justification for removing public sector wages from the estimation process, we do not use the productive-unproductive labour distinction, as applied by Moseley, for the following reason: once a complex technical division of labour has taken place it is arbitrary to ascribe the source of profit, or surplus-value creating activity, to individuals involved in particular sub-processes when all such workers are employed in capitalist firms, under capitalist production relations (for further discussion of the problems with the productive-unproductive distinction see Laibman, 1992).

We estimate s' using data extracted from the *Office for National Statistics* (ONS) website and other sources of UK government statistics (a full list of data sources is

provided in Appendix 1). Quarterly total profits (R in equation 2) are derived by aggregating the gross operating surpluses of private non-financial corporations, public non-financial corporations and financial corporations (not seasonally adjusted, NSA). The denominator of s' (W in equation 2) is derived from quarterly observations of total compensation of employees multiplied by the proportion of the workforce engaged in private sector employment.[6] However, because the latter data was only available annually prior to 1999 we interpolated quarterly observations from the annual data for the years 1987-1999, using the method proposed by Lisman & Sandee (1964). Since this was a slow-moving proportion we felt this was legitimate.[7]

The results of our calculation of s' are reported in Figure 1. The rate can be seen to fluctuate in the period in question, falling to 42.75% in 1992Q3 and 42.40% in 2002Q1, while rising to 62.15% in 1987Q4 and 62.21% in 1996Q4. These differences may be attributable to a number of factors. For example Cuestas and Philp (2010) use a VECM model to relate changes in the Marxian exploitation rate to the political party in power, establishing a short-run positive effect emanating from transition from Conservative to Labour government. In Section 4 of this paper we will use OLS regression to explain movements in s' as a consequence of changes in the size of the reserve army of the unemployed, working class militancy and changes in the level of aggregate concentration. Prior to this, in Section 3, we will survey and calculate a measure of aggregate concentration to be used in our regression analysis.
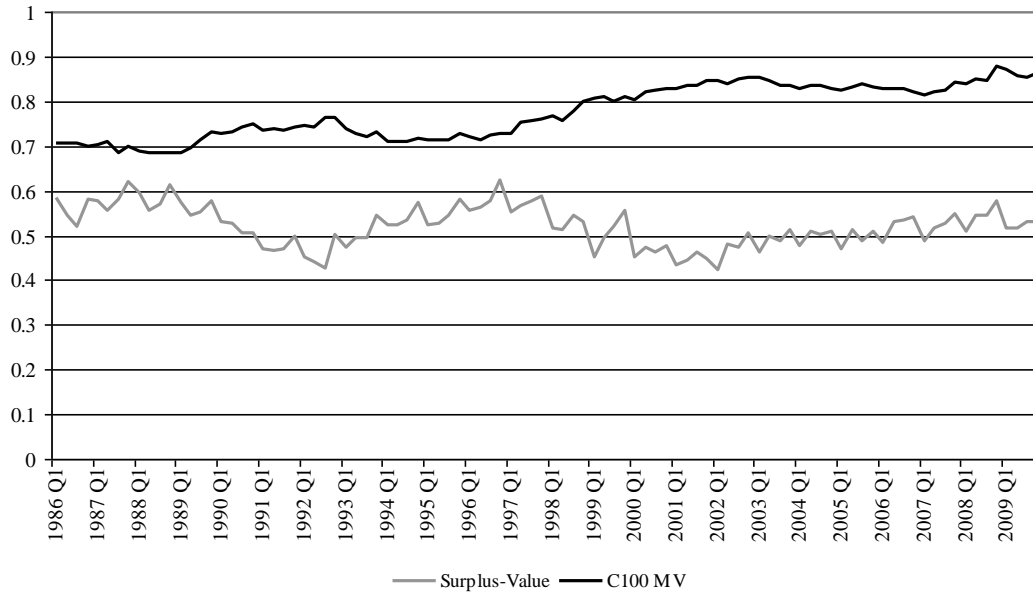
Figure 1: The rate of surplus-value and aggregate concentration, 1987-2009

3. Monopoly Power and Profits

Economists have long been interested in the relationship between concentration of production and profits. For example, in orthodox microeconomic theory pure monopoly is seen as a source of abnormal profit, and there is recognition — via empirical research — that monopoly power can lead to higher pries, reduced output and a monopoly welfare loss.[8] Government regulation of monopoly, too, is widespread. The scope of legislation has gradually expanded since 1890 (in the US), and 1948 (for the UK), though the latter is now regulated within an EU framework. Finally, the link between legal frameworks, case studies and economic context has been considered extensively within the structure-conduct-performance paradigm, employed within the Harvard Approach to industrial economics. Specifically the "market concentration doctrine" (MCD) — proposed by Mann (1966) — suggests that high degrees of seller concentration may facilitate collusion, thereby creating the conditions for higher profits in those industries.

Empirical evidence relating to the MCD has provided mixed results. Using US data, Bain (1951, 1956), Mann (1966) and Collins & Preston (1968) found that concentration has a small, but statistically significant, effect on profitability. Berger & Hannan's study (1998) found that US banks in highly concentrated markets were less efficient, offering further support for the MCD. Other studies have suggested an alternative explanation: individual firms capture market share because they are efficient, concurrently making above-average returns. This "efficiency hypothesis" has been tested by Smirlock et al. (1984), and by Eckard (1995). In each case they found a positive relationship between profits and market share, but no significant relationship between profits and concentration.

Industry-level analysis is similarly ambiguous in the UK case. Hitiris (1978) found that industry price-cost margins were positively related to high degrees of seller concentration, whereas Gerowski (1984) argues that price-cost margins are complex and no simple relationship between seller concentration and profitability can be found. Clarke et al (1984) examined UK manufacturing, arguing that if the efficiency argument holds we would expect significant differences in the profit rates of small and large firms within concentrated industries. However, *contra* the efficiency hypothesis, they found little difference in the profit rates of large and small firms in highly concentrated industries. More recent research lends some support to the MCD in the case of the banking industries in France, Germany, Italy, Spain and the UK in the 1990s (Goddard et al, 2004). Other recent work has investigated a panel of US data, 1963-1992, finding a positive relationship between price-cost margins and market concentration, and that this is weakest for increasing-concentration industries (Dickson, 2007).

A second approach examining concentration of control of the means of production involves looking at aggregate concentration, or the share of production controlled by the n largest firms in an economy. Aggregate concentration can be theoretically linked to market concentration, though empirical research has tended to treat investigation of the two separately (Clarke & Davies, 1983). The aggregate concentration ratio can be set at a number of levels, for example at the 50-firm, 100-firm and 200-firm level (abbreviated C50, C100 and C200 respectively). Aggregate concentration can also be measured in various ways, for example by value-added, employment, profits, sales-revenue, assets and market capitalisation, and there are advantages and limits in each case (see Hughes & Kumar, 1984, O'Neill, 1996, White, 2002, Tan, 2008). Before considering the specific measure to be employed in our empirical analysis of surplus-value — i.e. market capitalisation of FTSE100 firms as a proportion of market capitalisation of FTSE All Share firms — we will consider some of the empirical studies conducted for the UK and US.

The "value-added" approach to measuring aggregate concentration is recommended by White (2002). Value-added is the equivalent of net output, which resolves itself into the income streams which we associate with capitalist production (plus public sector wages). Aggregate concentration, measured by value-added, is defined as the share of net output produced by the n largest firms in the macroeconomy (e.g. for C100, $n = 100$). Empirically, evidence for the US economy suggests that aggregate concentration in manufacturing, measured by value added, increased between 1947 and 1963 (White, 1981). However, in the period since it has exhibited considerable stability (with C100 at approximately 33%), in spite of vigorous merger and acquisition activity.

"Employment" and "sales" constitute two further methods of measuring aggregate concentration. The former measure is represented by the distribution of employment, or the proportion of workers employed by the largest n companies. This measure, like aggregate wages or payroll, is simply a component part of value-added. However, faced with the practical problems of limited data it is a measure which has been used extensively, especially in the UK case. The evidence of White (1981, 2002) shows low and stable levels of aggregate employment concentration in the US economy (using a number of values for n). In the UK case Hughes & Kumar (1984) suggest greater fluctuations in private sector employment concentration, with a rise in C100 between 1968 and 1975 (from 34.9% to 39.8%), and a slight fall between 1975 and 1980 (to 37.3%). More recent work by Dietrich (2003) shows that employment concentration tended to fall in the UK economy between 1979 and 1997, whether measured by C20, C50 or C100. Sales measures of aggregate concentration in the US economy have been constructed by Nissan and Caveny (1993). Using a variety of measurement indexes they suggest an overall trend of rising concentration in sales in the period 1967-1990, while research by Dietrich (2003) suggests this pattern was mirrored between 1979-1997 for the UK economy.

Availability of data is a particular problem when seeking to estimate the trajectory of aggregate concentration in the UK economy. This is compounded by the fact we are seeking to examine the relationship between aggregate concentration and the change in s', measured quarterly. Value-added, employment or sales data is not readily available to allow us to calculate aggregate concentration in this way. Our solution is to use a measure of C100 proposed by Hughes & Kumar — the ratio of market capitalisation of the 100 largest companies listed on the UK Stock Exchange (FTSE

100) to market capitalisation of all companies (FTSE All Share). The advantage of this measure (C100 by market capitalisation, abbreviated M) is that it is a feasible proxy of aggregate concentration which can be calculated quarterly using information extracted from Thompson DataStream. The disadvantage of this measure is that it is imperfect because firms listed on the UK stock market include some which are ostensibly non-UK companies in terms of production activity and sales. This problem manifests itself for many empirical investigations (in labour economics, industrial organisation etc.) since the globalised nature of contemporary competitive capitalism exposes the weakness of (methodologically) closed-system models.

Our estimates of M are presented in Figure 1. It is noteworthy that there is a tendency for M to rise during much of the period, from 68.36% in 1988Q2, to 87.77% in 2008Q4 (hence, because the series is non-stationary we use ΔlM as an independent variable in our regression). The issue, to be discussed in the next section, is whether changes in concentration of control of the means of production impacts on the distribution of income in the capitalist sector, measured by s'.

4. Empirical Analysis

4.1 Quantitative Marxism, Methodology and Data

In our empirical analysis we adopt a QM approach, i.e. we use quantitative data to examine and test Marxian theoretical propositions and models. In the particular application of QM we adopt we apply basic OLS regression, familiar from mainstream econometrics, to investigate the relationship between distribution of income and growing concentration of control of the means of production in the UK economy. Plainly, readers of this *Journal* are likely to be familiar with the critiques of

mainstream economics and its ubiquitous application using econometrics. These critiques are diverse, ranging as they do from those which suggest that mainstream economics took mathematisation and the application of econometrics too far (McCloskey, 1986), to those who see more fundamental problems lying behind such an approach to social scientific investigation. It is our aim, in this section, to show how multiple regression techniques can be used to explore issues of traditional interest to Marxists. This should not be taken to infer that other quantitative approaches do not have equal validity in social scientific research, nor that the extensive range of qualitative methods open to investigators have less validity. Mainstream economists have taken econometrics too far — emphasising statistical complexity over economic relevance — but this should not prevent Marxist economists from exploring these techniques alongside other methods of enquiry.

Data considerations are also important; broadly, there are three approaches which can be adopted in selecting the data for examination (Dunne, 1991, 9-10): (i) researchers can attempt to measure Marxian categories directly; (ii) orthodox data could be adjusted to make it closer to the required Marxist categories; (iii) we can use Marxist theory to attempt to explain the movement in the orthodox statistics. Of these three approaches the first is most difficult in terms of data gathering, leading to problems with small samples and a lack of aggregate evidence. The second approach has offered important insights into capitalist economies (e.g. Gouverneur, 1990), but often the categories map unsatisfactorily and the most appropriate types of data are gathered infrequently.[9] The final approach is least problematic in terms of data requirements, but the specific Marxian insights we can garner are limited (though, we contend, not eradicated). The implication is that no one method of data acquisition is

unproblematic, and we would concur with Dunne who suggests: 'these approaches should complement each other, using different types of data to answer different questions at different levels of abstraction' (1991, 9-10).

In examining the specific case of the relationship between changing concentration of control over the means of production in the UK economy and the rate of surplus-value we have taken orthodox statistics. The data used to measure exploitation was outlined at the end of Section 2, and the data used to provide our market capitalisation measure of aggregate concentration was outlined at the end of Section 3. In the econometric model below we use two further explanatory variables which are intended to capture aspects of the class struggle. First, in order to proxy working class militancy we shall consider strike action (measured by the aggregate number of days lost due to industrial action, S) as a variable in our regression. Although some favour "number of strikes" as a proxy for militancy (e.g. Arestis & Biefang-Frisancho Mariscal, 1998) many strikes are not registered, leading to measurement problems. Moreover, the number of strikes makes no distinction between long strikes involving many workers and small, local disputes. One advantage of our approach is that it gives greater weight to disputes involving large number of workers. Secondly, the relationship between surplus-value and unemployment — or the size of the "reserve army" — is also an important dynamic in the distribution of income (between capitalists and their workers). In order to estimate the association between unemployment and s' we will use the claimant count (U) to measure the size of the reserve army of the unemployed. Our use of claimant count, rather than an unemployment rate, stems from our earlier decision not to consider self-employed income, instead focussing on the gross operating surpluses of companies and

compensation of employees working in the capitalist sector. If we used an unemployment rate as an independent variable the self-employed would be included in the denominator which, given they are exploitation-neutral, would provide a less satisfactory measure.

4.3 Econometric Model, Estimation and Results

In the present paper we are interested in how changes in the distribution of income in capitalist production — expressed as a Marxian surplus-value rate — are affected by changes in the balance of class forces, including the extent of big business. The dependent variable is change in the rate of surplus-value, $\Delta s'_t = s'_t - s'_{t-1}$. We hypothesise that this is connected to aggregate strike days, and that this relationship may be non-linear. Thus we take the natural log of aggregate strikes in the previous period, S_{t-1} , as one of our independent variables. Secondly, we hypothesise a relationship between changes in the rate of surplus-value and unemployment. As unemployment increases this creates the conditions for changing the distribution of income in favour of capitalists. Again, we speculate that this relationship may be non-linear so we recalculate the series in terms of natural logs, lU , and use ΔlU_{t-1} as an independent variable in our regression. Finally, as discussed in Section 3, we hypothesise that changing aggregate concentration changes the distribution of income in capitalist production with, for example, rising aggregate concentration leading to an increasing rate of surplus-value. This relationship may be non-linear, hence we transform the series M into natural logs and examine the difference, i.e. ΔlM , as another independent variable.[10]

Our hypothesis, therefore, is that:

$$\Delta s'_t = f(lS_{t-1}, \Delta lU_{t-1}, \Delta lM) \tag{3}$$

The OLS regression results for equation (3) are presented in Table 1. The diagnostic tests suggest that the model is plausible, reflected in a low probability value for the F-statistic. The Durban Watson statistic indicates no problems of first order serial correlation. Finally, the adjusted R-squared is as expected: the model explains some of the change in s' but much of it remains unexplained since the social system is complex and we are using proxies which are imperfect. Nevertheless, we have found statistically significant associations. There is a tendency for s' to fall through the period in question, manifest with a negative coefficient for the constant. The positive coefficient for lS_{t-1} suggests that strike action is unsuccessful and/or defensive since strikes are associated with rising surplus-value in the subsequent period. This lends weight to the thesis that unions were, in some sense, rendered impotent by the anti-union legislation enacted by the Conservative governments from 1979-1997. The coefficient for ΔlU_{t-1} indicates that rising levels of unemployment are associated with increases in the rate of surplus-value in the subsequent period, as we would expect. Finally, the movement in aggregate concentration also produced the results we would expect: growing concentration in control over the means of production ($\Delta lM > 0$) changes the distribution of income within capitalist production in favour of capitalists, manifest as a rising rate of surplus-value in the subsequent period.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.02728	0.015223	-1.791690	0.0766
lS_{t-1}	0.00537	0.003014	1.781443	0.0783
ΔlU_{t-1}	0.17327	0.048044	3.606468	0.0005
ΔlM	0.63231	0.247881	2.550860	0.0125

R-squared	0.183094	Mean dependent var	-0.00055
Adjusted R-squared	0.155245	S.D. dependent var	0.033417
F-statistic	6.574512	Durbin-Watson stat	2.189956
Prob(F-statistic)	0.000462		

Table 1: Determinants of $\Delta s_t'$, 1987Q1 to 2009Q4

Before concluding, let us now consider some of the other approaches and models we considered when examining the relationship between surplus-value and concentration of control over the means of production. After running our initial model we also attempted a parsimonious approach, introducing variables above, lagged for up to four periods, as well as additional variables. For example we included growth in GDP (which may be considered an important independent variable in a "Smithian" framework). However, while the additional variables improved the R-squared (as would be expected), growth rates emerged as insignificant.[11] In addition we considered a model which did not transform the series using natural logs, i.e. $\Delta s_t' = f(S_{t-1}, \Delta U_{t-1}, \Delta M)$. In this case the constant and S_{t-1} ceased to be significant (at the 10% level), and the diagnostics suggested an inferior fit. We believe this indicates our preconception that relationships between variables may be non-linear is, accordingly, justified.[12]

5. Conclusion

Movements in the rate of surplus-value can be explained by a number of forces. In the present study we have focussed on three: the impact of strike action, the effect of

changes in the size of the "reserve army" of the unemployed, and changing levels of aggregate concentration among UK listed companies. The results were significant. After a raft of anti-union legislation in the 1980s, strike action seems to have become, largely, a defensive measure, since strikes in the previous period are associated with rising surplus-value in the next. Secondly, the relationship between unemployment and surplus-value is as expected: an increase in unemployment in the previous period manifests as rising surplus-value in the next. Finally, and most interestingly, we found rising levels of aggregate concentration among UK companies in the period 1987-2009, and that this appeared to produce a monopoly power effect, whereby the rate of surplus-value rose within capitalist production. Monopoly capitalism, it would seem, is ascendant.

Our empirical contribution notwithstanding, we would like to conclude with some reflection on the approach we have adopted. It is our contention that we have provided an important and interesting insight into the contemporary UK economy using a QM approach. By using UK government data, and financial data extracted from Thompson DataStream, we have examined empirical regularities and found that they accord, convincingly, with our prior theoretical propositions. This should not be taken to imply that UK government data is always suitable to investigate Marxian categories, or that regression is a ubiquitous method which is universally appropriate.[13] Econometrics is just one method, and other statistical approaches are valid and appropriate for social scientific research. Moreover, qualitative research is extremely important, both in its own right and alongside quantitative investigation. Our methodological claim, thus, is minimal: econometrics *can* be used as a tool of Marxian investigation, but its use should not be ubiquitous. And, in the particular case

we have investigated — the relationship between the rate of surplus-value, union militancy, unemployment and aggregate concentration — the results this approach has uncovered have been insightful.

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Appendix 1: Statistics Sources

Definition	ONS Code	Source
Gross Operating Surplus: Financial Corporations (NSA)	NQNV	ONS Website http://www.statistics.gov.uk/default.asp Accessed 15th October, 2010
Gross Operating Surplus: NFCos: Private (NSA)	NRJK	
Gross Operating Surplus: NFCos: Public: (NSA)	NRJT	
Total Compensation of Employees (NSA)	HAEA	
Aggregate Strike Days (NSA)	BBFW	
Claimant Count (NSA)	BCJA	
Private Sector Employment as a Proportion of the Total (Annual)	DB37	1992-2010 ONS Website (as above) 1986-1991 *Economic Trends* 434, December 1989 London: HMSO *Economic Trends* 458, December 1991 London: HMSO *Social Trends* 20, 1990. London: HMSO
Market Capitalisation FTSE100		Thompson DataStream
Market Capitalisation FTSE All Share		Thompson DataStream

Endnotes

[1] The authors would like to thank Simeon Coleman, Carlyn Dobson, Barry Harrison, John Marsh, Marie Stack, and Dan Wheatley for comments on an earlier draft. Remaining errors are our own.

[2] This was most exhaustively considered in the first volume of *Capital* (Marx, 1976). Important contributions in recent decades include Morishima (1973), Steedman (1977), Roemer (1981, 1982), Foley (1986), Laibman (1992), Freeman et al (2004), Kliman (2007), Veneziani (2007) and Yoshihara (2010).

[3] Morishima demonstrates that the conditions 'necessary and sufficient for the existence of a set of non-negative prices and a wage rate yielding positive profits in every industry … [exist] if and only if the "real wage rate" … is given such that the rate of exploitation … is positive. This result … may be claimed as the Fundamental Marxian Theorem, because it asserts that the exploitation of labourers by capitalists is necessary and sufficient for the existence of a price-wage set yielding positive profits or, in other words, for the possibility of conserving the capitalist economy' (1973, p.53).

[4] While the present paper is concerned with the relationship between surplus-value and elements in the class struggle, contemporary events resonate with many other aspects of Baran & Sweezy's work. They analyse monopoly capitalist society in terms of giant corporations, run by self-perpetuating managerial groups, which dominate mature capitalist economies. The sales effort, manifest through advertising, is central in the capitalist socio-economy. Military spending is conceptually important,

28

supporting capitalist industry and absorbing surplus. Large corporations are considered part of an associated imperialist process. The significance of the latter, for international relations, is summarised thus: 'What … [multinationals] want is monopolistic control over foreign sources of supply and foreign markets … And for this what they need is not trading partners but 'allies' and clients willing to adjust their laws and policies to the requirements of … Big Business (1966, p.200). The role of US big business in the aftermath of the recent Iraq War might be considered a case in point, as the Vietnam War was at the time when Baran & Sweezy were writing.

[5] Roemer (1982) uses a rational choice approach to show that five classes can emerge in a pure capitalist economy (where exploitation is mediated via the labour market): (i) pure capitalist; (ii) small capitalist; (iii) petty bourgeois artisan; (iv) semi-proletarian; (v) proletarian. Capitalists are, in essence, employers; proletarians are employed. However, remaining agents are wholly or party self-employed and while working for themselves they extract no surplus-labour from another. In this sense they are exploitation-neutral. Hence, in empirically calculating s' in the present paper we remove self-employed activity (and remuneration), instead focussing on wage and non-wage income derived from capitalist employment.

[6] The definition of wages is an issue for Marxian economists. The sum of compensation of employees include some elements which might be thought of as rewards paid out of surplus-value — for example the bonuses of bankers, media advertising executives etc. Marxian research on wage inequality and the nature of bonuses would be an interesting area for further development.

[7] In order to assess whether this procedure was reasonable we calculated an interpolated series (from the annual data) for the period 1999-2009 and compared it to the quarterly series available via the ONS website for those years. Deviations were very small. The largest deviation of the predicted from the actual quarterly surplus-value rate was 0.228 percentage points, i.e. the interpolated level of s' in 2009Q3 was 53.01% whereas the actual series provided an estimate of 52.78%. Only 5 of the 54 interpolations caused a deviation in s' of more than 0.1 percentage points.

[8] Harberger (1954) conducted an empirical study of US manufacturing (1924-1928) and found that approximately 4% of manufacturing resources were misallocated in the second half of the 1920s, representing approximately 1.5% of gross national product. On this basis he concluded: 'Our economy emphatically does not seem to be monopoly capitalist in big red letters … When we are interested in the big picture of our manufacturing economy, we need not apologise for treating it as competitive, for in fact it is awfully close to being so' (p.87). Subsequent estimates by Cowling & Mueller (1978) adopted an alternative approach which took account of firms with below-competitive profits. Their results for the US economy (1963-1966) suggested a maximum monopoly welfare loss of 13.14%, and a monopoly welfare loss for the UK economy (1968-1969) of up to 7.20%.

[9] The frequency of data is also a problem in UK aggregate concentration evidence. For example Hughes & Kumar (1984) only provide an annual series for their C100 'market valuation' measure (which is essential the same as our market capitalisation approach) of aggregate concentration; other measures — such as C100 by employment, sales and assets — are only provided at five year intervals.

[10] All of the independent variables were tested for stationarity using the Augmented Dickey-Fuller test. The series S was found to be stationary. The remaining explanatory variables were transformed (as above) in order to induce stationarity so that each was of the same order.

[11] We also tested for structural breaks in the data, especially 1997Q2 which was associated with the election of the first New Labour Government. The Chow (1960) test did not suggest any structural break in our data.

[12] The regression results derived in this process are available from the authors on request, as are the tabulated data which was the basis for the regressions.

[13] Other datasets can be used to investigate the capitalist socio-economy, for example the *Labour Force Survey* and the *British Household Panel Survey*. However, the tendency to construct employee and employer surveys separately creates an impediment to investigating the labour process at the microeconomic level.