NOTTINGHAM TRENT UNIVERSITY

DISCUSSION PAPERS IN ECONOMICS

No. 2010/2 ISSN 1478-9396

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April 2010

DISCUSSION PAPERS IN ECONOMICS

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Abstract

This paper contributes to our understanding of the determinants and dynamics of Marxian exploitation using quarterly UK data, 1955-2008. Initially a simple model is introduced for the purpose of defining exploitation and its component parts, before elaborating on theoretical issues which are important in estimating the rate of exploitation. In the empirical analysis we seek to explain the effect of class struggle, for the UK economy, using quarterly data. Attention is paid to three forces which are traditionally seen as drivers of power in the class struggle: (i) political party; (ii) the size of the "reserve army" of the unemployed; (iii) working class militancy. Our results suggest a positive impact of unemployment on the rate of exploitation, and that growing working class militancy tends to diminish the rate. Changes in political party affect the rate of exploitation in a counter-intuitive way, with a positive short-run relationship between the rate and movements to left-wing government.

***Keywords*:** Quantitative Marxism, Exploitation, Class Conflict

***JEL Classifications*:** B51, D33, E11, J20

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The authors would like to thank Ian Fraser and Ron Smith for comments on an earlier draft. We are also grateful to the staff at Loughborough University Library for their help in obtaining historical data. Juan Carlos Cuestas acknowledges financial support from the CICYT project ECO2008-05908-C02-01/ECON. Juan Carlos Cuestas is a member of the INTECO research group.

1. Introduction

The claim that capitalism is an exploitative economic system is one of the central tenets of Marxian social science. While the term "exploitation" may be used in many ways in contemporary economics — for example to describe situations where firms with monopoly power achieve abnormal profits — in Marxian economics it is defined in a specific way. Basically, in capitalism, to be exploited means working for longer than is necessary to produce the equivalent of what one consumes.

Marx's original formulation of exploitation was embedded in his theory of value. The difficulties inherent in this approach absorbed the attention of Marxist scholars for many years. However, in the 1970s and 1980s approaches began to emerge which relocated versions of exploitation theory in price systems inspired by Leontief, Sraffa and Arrow-Debreu.[2] The separation acted as a stimulus to radical theory: Marxian economists who found the traditional formulation of value and price problematic could now engage in research on the theory of exploitation, unencumbered by mainstream criticism.

One of the most noteworthy contributions to Marxian exploitation theory was made by Roemer (1980, 1982, 1988, 1994). Using the language and techniques of general equilibrium and game theory he derived outcomes which suggested that the differential ownership of productive assets (DOPA) was the primary normative inequity in capitalism and that the traditional Marxian formulation of exploitation,

[2] These approaches — described by some as "supply side Marxism" — focus on price in terms of the cost of labour and non-labour inputs, plus profit. In dynamic settings Marxist analyses have also explored effective demand and its role in crisis, examining the overlap between Marx, Keynes and Kalecki (see Trigg, 2006). Our "supply-side" approach concentrates on production.

expressed in terms of surplus-value and surplus labour-time, was secondary. Roemer (1994, p.110) did eventually concede that labour plays a role, too, in defining a normatively useful concept of capitalist exploitation. However, DOPA was also essential in this definition.

There remains ongoing interest in Roemer's seminal work (Veneziani, 2007, Yoshihara, 2010). The goal of this body of research has been to look at the welfare properties of capitalism from a microeconomic perspective, in a manner not unlike the search for, and proof of, the welfare theorems of mainstream general equilibrium theory. While this research has merit we intend to adopt a different approach to analyse the same concept, in a way also inspired by the methods and techniques of mainstream theory. Using the techniques of time-series econometrics we estimate the rate and evolution of exploitation in the UK economy and explain it empirically in terms of specific macroeconomic, social and political forces. This *quantitative Marxist* approach focuses on class-income distribution emerging out of the production process. However, we accept that DOPA, at the microeconomic level, is an important generative mechanism.

We begin, in Section 2, by defining exploitation in a Marxian sense, before considering a number of pertinent theoretical concerns. In particular the productive-unproductive labour distinction is rejected as an unnecessary artefact of classical economics. Secondly, we recall Roemer's (1994) argument for treating the self-employed, conceptually, as exploitation-neutral. In Section 3 we calculate the quarterly exploitation rate for the UK economy, 1955-2008, and consider the variables to be used to measure the balance of class forces. Before concluding the penultimate section uses the Johansen (1988, 1991) cointegration and vector error correction model to examine changes in the exploitation rate as a consequence of changes in the balance of class forces.

2. Theoretical Underpinnings

The Marxian notion of exploitation in capitalism is founded on Marx's analysis of surplus-value (for discussion of exploitation in other economic systems see Roemer 1982, 1994). This can be expressed in various alternative and equivalent ways, in each case encapsulating distribution between worker and capitalist. We can identify two broad explanatory approaches towards the Marxian exploitation rate:

1. Decompose the technical determinants;
2. Estimate statistical relationships between exploitation and class struggle.

In this section we will adopt the first approach, defining exploitation and decomposing it (as in Marx, 1976, pp. 281-672) into its constituent elements. In Section 3 we examine exploitation statistically, explaining changes in the UK rate in the last half-century. The elements of "class struggle" which will be investigated are political party, working class militancy and unemployment.

In order to define exploitation let us take a simplified economy (following Roemer 1988, pp.42-44). For a given technology $\{A, \mathbf{L}\}$ assume that A is an $(n \times n)$ input-output coefficient matrix and $\mathbf{L}$ is a $(1 \times n)$ vector of *direct* labour inputs used to produce each commodity. We shall assume $\mathbf{L}$ is measured by the number of hours worked in a given time period (in our econometric analysis we will use quarterly data). Assume $\mathbf{b}$ is an $(n \times 1)$ vector of workers' consumption goods. In this case we are interested in finding the vector of gross outputs ($\mathbf{x}$) which will produce $\mathbf{b}$ as a net output. If $A\mathbf{x}$ are the inputs consumed in the year, the required output will be:

$$\mathbf{x} = A\mathbf{x} + \mathbf{b} \tag{1}$$

Roemer elaborates on this by taking I which is an $(n \times n)$ identity matrix. If $(I - A)$ is invertible and productive — i.e. it is capable of producing positive net outputs — an economically meaningful solution to (1) is:

$$\mathbf{x} = (I - A)^{-1}\mathbf{b} \tag{2}$$

The expression in (2) is measured in physical quantities.

In order to derive a Marxian exploitation rate let us now consider the amount of labour (measured by the number of hours worked) needed to produce workers' consumption. Following Roemer, if the labour embodied in each unit of the n commodities in the economy is given by the $(1 \times n)$ vector $\mathbf{\Lambda}$, we can define socially necessary labour time (SNLT) as follows:

$$\text{SNLT} \equiv \mathbf{\Lambda b} = \mathbf{L}(I - A)^{-1}\mathbf{b} \tag{3}$$

That is SNLT is a scalar defined as the amount of direct and indirect labour required to produce workers' consumption.

It is a characteristic of capitalist production that workers as a whole generally work for longer than the time required to produce the equivalent of what they themselves consume. If aggregate hours worked in the economy are given by H then $\text{H} - \text{SNLT}$ measures the surplus labour time being preformed by workers. The ratio of the latter to SNLT gives us an expression for the rate of exploitation (e):

$$e = \frac{\text{H - SNLT}}{\text{SNLT}} \tag{4}$$

This equation is consistent with one of Marx's formulations of exploitation, in terms of surplus and necessary labour time (1976, pp. 281-672).[3] This can then be related to the decomposition suggested above. In equation (4) an increase in H (absolute surplus-value) will, *ceteris paribus*, increase e. Likewise a reduction in the real wage (which changes $\mathbf{b}$) implies that SNLT, defined in equation (3), diminishes, since the consumption bundle is reduced and can thus be produced more quickly. Finally, if there is productivity increase (which affects $\mathbf{\Lambda}$) the length of time required to produce a given consumption bundle diminishes, thereby increasing e.[4]

There are two theoretical issues which warrant further consideration prior to our empirical analysis. First, in previous empirical estimates of the rate of surplus-value the distinction between productive and unproductive labour has been applied (e.g. Gouverneur, 1990). Although frequently applied in Marxian work this categorisation of labour is not straightforward. Of the many definitions used (see Laibman, 1992), the analytic definition — which defines labour as productive if it creates surplus-value — is perhaps the most widely applied in Marxian economics. It is also the relevant concept when estimating the rate of exploitation. In this paper we do not apply the productive-unproductive labour distinction for the following reason. Once a complex social division of labour has taken place it is arbitrary to ascribe the source of wages, or surplus-value creating activity, to individuals or particular sectors. Since capitalism is a *system* it is incorrect to define some employees as exploited, and

[3] The rate of exploitation can also be expressed, in aggregate, in monetary terms, as the ratio of profits, interest and rent to wages paid (i.e. variable capital). This is the way we will calculate the exploitation rate in the empirical analysis.

[4] An alternative approach to income distribution is provided by the Gini coefficient (for example see Roemer, 2008). This conflates wage and non-wage income, though such a measure has the advantage of being sensitive to wage inequality. The distribution of wages is an important intra-class issue. However, the purpose of our paper is to examine the inter-class distribution between wage and non-wage income.

others as not, when both groups may be receiving the same wage, with equivalent background and conditions. In this paper exploitation is conceived of as a relationship between classes and society based on receipts of wage and non-wage income.

A second conceptual issue presents itself in examining a two-class model. The self-employed (or petit-bourgeoisie) are empirically relevant. The conceptual formation of class has been discussed at length by Roemer (1988, 1994). Using microeconomic theory, and assuming rational optimising agents, he shows that five classes can emerge in a 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, some agents — small capitalists, petty bourgeois artisans and semi-proletarians — are wholly or party self-employed. For example petty bourgeois artisans work entirely for themselves, hence they do not extract surplus-labour, or profit, from another. In this sense they are exploitation-neutral. Semi-proletarians are partly self-employed, but also sell some labour on the labour market. They are exploitation-neutral while engaged in self-employed activity, but are exploited while engaged in paid work for another. Hence, in empirically calculating e, self-employed activity (and remuneration) should be removed and we should focus on wage and non-wage income derived from employment.

3. Variables and Data

Defining exploitation thus, changes in e can be driven by various elements in our decomposition. These elements are changes in working hours (H), technical change (influencing $\mathbf{\Lambda}$) or changes in the real wage (impacting $\mathbf{b}$). Another important determinant of change in e is change in the balance of class power, which impacts on it via various elements in our decomposition. For example, when unemployment is high we can speculate that e will be high because employers can force workers to accept reduced wages and work longer hours. In this situation the *cause* of movement in e is an alteration in the balance of class forces, and changes in the real wage and working hours are the mechanism through which exploitation is increased.

Although class relations may be obscured in capitalist economies today, there remain identifiable income streams associated with work and non-work (which is the basis for defining class in this paper). Political and economic forces may also influence these income streams. It is the relationship between exploitation and these forces which we will consider in this section. In particular we are interested in the following variables: (i) the political party in power; (ii) working class militancy; and, (iii) the "reserve army" of the unemployed.

The evolution of e for the UK is presented in Figure 1, and the data sources used for each of our variables is outlined in Appendix 1. The period investigated is 1955Q1 to 2008Q4 and this was determined, strictly, by the availability of data. For the purpose of estimation we will define e as the ratio of profit to wages, excluding the self-employed. Thus, calculated quarterly, the numerator is the sum of the gross operating surpluses of public non-financial institutions, private non-financial institutions and financial corporations (not seasonally adjusted, NSA). The denominator is the total compensation of employees for each quarter, and we can therefore derive e, quarterly, for the period 1955-2008. Note we derive this in monetary units, for the following reason. If we were to calculate aggregate SNLT and aggregate surplus labour time we would do so by allotting total hours worked in proportion to aggregate wage and non-wage income. Given this transformation procedure the numerator and denominator would be affected equivalently. Hence, for present purposes, it is an unnecessary step.

The first independent variable, political party (of government), is of interest because of the historical constituencies of the left-wing Labour Party, and the right-wing Conservatives. In the UK political system the latter receive significant funding from employers, via private donations, while the former are largely funded by trade unions. Hence, within mainstream politics, the Labour Party are seen as the party of workers and the Conservatives the party of employers. In contrast, in Marxist analyses, the State is seen as a regulator of social relations between capital and labour. The goal of the State, in these circumstances, is to ensure the continuance of capitalism. As such, we cannot necessarily assume that the Labour Party will support the working class, and the Conservatives, business. The relationship between e and political party therefore becomes crucial in evaluating these two competing perspectives. We will initially hypothesise that e will be affected negatively if the Labour Party gains a parliamentary majority, and positively if the Conservatives gain power. The variable P is defined 0 if the Conservatives are in power and 1 if the Labour Party is in power.

A second cause of variation in e is the extent of working class unity, which is a partial manifestation of class consciousness. The capitalist strategy of "divide and rule" can, for example, be countered by trade union activity intended to strengthen the position of the working class in the distributive struggle. In order to measure working class unity and militancy we shall consider strike action (measured by the number of days lost due to industrial action, S) as a proxy for this. Some studies use the number of industrial disputes (e.g. Arestis & Biefang-Frisancho Mariscal, 1998); we initially used this measure, but there was no long-run relationship. Conceptually, the approach we adopt also gives greater weight to disputes involving large number of workers, which is reasonable.

The third independent variable we investigate is the claimant count (NSA). The relationship between distribution and unemployment — or the "reserve army" — is a hallmark of the Marxian analysis of capitalism. In order to estimate the association between unemployment and e we will use the claimant count (U) to measure the size of the reserve army of the unemployed.[5] We hypothesise that in periods when the number unemployed is growing the balance of class forces shifts toward capitalists, thereby facilitating rising exploitation. The logic of this is that when unemployment is high employers are able to force wages down, increase hours for those in employment (perhaps while shedding workers), or introduce new production methods.

[5] We do not investigate the causes of unemployment, though we may speculate on some of them. Technical change was one factor which Marx considered, and a tendency toward monopoly another (1976, pp. 781-794). Post-Keynesian approaches have focussed on aggregate demand and the role of investment (e.g. Arestis & Sawyer, 2005, Smith & Zoega, 2009). Since our paper is focussed on the supply side of the economy we do not explore such issues.

4. Econometric Methodology and Results

Having outlined our theoretical model and data sources, this section analyses the effect of P, S and U on the long-run behaviour of *e*. The expected long-run relationship is as follows

$$e = f(P, S, U) \tag{5}$$

In order to perform our analysis we transformed e and the latter two variables into natural logarithms, i.e. le, lS, and lU, and then applied the Johansen (1988, 1991) cointegration and vector error correction model (VECM):

$$DX_t = \sum_{i=1}^{p=1} \Gamma_i DX_{t-i} + \alpha\beta' X_{t-1} + \alpha\delta_0 Ds_t + \mu_0 + \varepsilon_t \tag{6}$$

This has a constant restricted to lie in the cointegration space, $X_t = \{le_t, lS_t, lU_t\}$, $\mu_0 = \alpha\beta_0 + \alpha_{\perp}\gamma_0$, such that β_0 is an intercept in the cointegration relationships and γ_0 is equal to zero. The coefficient δ_0 represents mean shifts in the variables which do not cancel out in the cointegration space. Mean shifts are captured by a set of dummy variables, Ds_t. Note that this variable is P, which has been treated as exogenous. In our analysis we also included three centred seasonal dummies to account for seasonality effects.

We selected the number of lags for our VECM according to the Schwarz information criterion (from a maximum of 10). This was in order to control for autocorrelation and delays in the transmission process. Based on this criterion we used 10 lags, which is intuitively reasonable given the distributional effects of a change in political party may experience long delays. The baseline model was been checked for signs of misspecification — i.e. normality, autocorrelation and heteroskedasticity — and results are reported in Tables 1 and 2. The hypothesis of normality of the residuals was rejected. However, because the normality problem arises from an excess of kurtosis, the estimators by maximum likelihood are robust (Gonzalo, 1994).

Table 3 presents Johansen's stationarity tests. The null hypothesis is rejected at the 10% significance level for $r = 1$ and it cannot be rejected for *le* if $r = 2$. The choice of the cointegrating rank was made by looking at the trace test and roots of the companion matrix, which are reported in Tables 4 and 5. In this system we only had one cointegrating vector, although shocks have long lasting effects. The graph of the cointegrating relationship is reported in Figure 2, which mimics a white noise process.

Once the cointegrating rank has been determined, the next step in the analysis was to test for long-run exclusions of variables. The hypothesis that P and the drift are long-run excluded cannot be rejected at the 10% significance level ($\chi^2(2) = 1.141$, p-value = 0.565). This implies that the drift in the cointegration space cancels out, as well as the long term effects of the political party.

Next, we tested for the weak exogeneity of the variables and the results point to the non-rejection of such a hypothesis for the variables D*lS* and D*lU* ($\chi^2(4) = 7.760$, p-value = 0.101). This means that the error correction term will only appear in one equation, i.e. D*le*.. This result accords with our initial hypothesis, which explains e as a function of the rest of the variables. Thus, the identified cointegrating vector is:

$$l\hat{e}_t = \underset{(2.677)}{0.280}\, lS_t - \underset{(-4.126)}{0.483}\, lU_t \qquad (7)$$

where the t-statistics appear in parentheses. This result is as expected. As the claimant count rises the rate of exploitation rises. In classical Marxian terms a rising "reserve" army of the unemployed impacts on the labour market, shifting the balance of class forces towards capitalists, causing e to rise. The effect of working class militancy is also pronounced, and as expected. As workers are more militant then days lost to strike action increase, shifting the balance of class forces toward workers, causing e to fall. Our analysis shows that this effect is pronounced; in fact nearly half of the movements in lS are transmitted to exploitation.

In order to test for the stability of the cointegrating vector and the adjustment parameter we display the graphical representations of the Hansen & Johansen (1999) tests in Figure 3. According to these tests the cointegration vector and loading parameters are stable.[6] We have also reported the impulse response function in Figure 4, where it is noticeable that shocks have log lasting effects on exploitation. This implies that, after a shock, the variable needs long periods to return to the equilibrium. The short-run matrices have been reported in Appendix 2. In terms of results the effect of changes in the political party DP/Dle is perverse. Change in political party, from right-wing to left-wing in the previous period, exerts a small, positive, but statistically significant, effect on e. This result conflicts with our initial hypothesis, and runs counter to the mainstream interpretation — where the term "mainstream" is used colloquially — of the traditional constituencies of the respective political parties.

[6] Following Hansen & Johansen (1999) the R representation of the test is more relevant since it keeps the dynamics fixed during the recursive estimation. Given that the representation of the test is below one during most of the sample period we conclude that the parameters are stable. For the alpha matrix the test appears to be stable only after some initial years. However, given that this test is a recursive one, instabilities at the beginning of the period do not imply the existence of structural breaks.

There may be a number of potential causes of this. First, the effect is weak and one interpretation might be that the policy differences between the parties are small. The traditional view of the Labour Party as pro-worker may allow them to introduce policies which increase exploitation more effectively than would be possible under the Conservatives. Alternatively, there are different strategies which capitalists can adopt to extract surplus. If a left-wing government introduces wage regulation and limits on working hours then capitalists may shift strategy to alternative methods of surplus extraction, such as productivity increase. And, productivity increase, through its impact on Λ, may be a more effective way to increase e than holding wages down or work-time excess. In other words regulation of hours and pay generates a beneficial unintended consequence for capitalists. This explanation would resonate with Marx's analysis of nineteenth century Britain where the legal limitations on work-time imposed by the Factory Acts resulted in a shift of focus from extensive to intensive methods of labour utilisation. Thus, left-wing policies may positively influence wages and hours, but capitalist strategy would shift to intensifying work. And, the latter is a more effective way to exploit workers than is the former. Finally, the variables we have used are derived from national income statistics expressed in gross terms. It is important to distinguish between gross incomes and the distribution achieved after tax, benefits and subsidies have been accounted for. In other words the significance of right-wing and left-wing governments may be felt more in the process of redistribution rather than in production.

4. Conclusion

It is a central tenet of Marxian economics that capitalism is exploitative. This implies workers work for longer than is necessary to produce the equivalent of what they themselves consume. Microeconomic studies have focused on the microfoundations of exploitation. The innovation of this paper is that we have calculated the rate of exploitation for the UK economy using an *extensive* run of quarterly data, considering it in relation to a number of politico-economic determinants. Our results suggest that the traditional argument concerning the “reserve army” of the unemployed — which links rising levels of unemployment to increasing exploitation — accords well with the historical record. Secondly, working class militancy (measured by days lost to industrial action) also has a profound negative impact on the rate of exploitation, as Marxian economists would expect. However, when we examined the empirical relationship between UK political parties and exploitation we generated a paradoxical result (from the perspective of mainstream politics). In switching from right-wing Conservative to left-wing Labour administrations exploitation tends to rise. This lends support to the hypothesis that the role of both parties is to support the State in regulating social relations between capital and labour.

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Table 1: Univariate misspecification tests

Test	**D*le***	**D*lS***	**D*lU***
ARCH	0.086	0.346	0.357
J-B	0.000	0.000	0.000
Skewness	-0.178	-0.260	-0.239
Kurtosis	4.460	9.022	4.743

Note: ARCH stands for Autoregressive Conditional Heteroskedasticity. J-B is the Jarque-Bera test for normality. For these two tests the p-values have been reported.

Table 2: Multivariate misspecification tests

Autocorrelation:	Ljung-Box	$\chi^2(369) = 474.6$ (0.000)
	LM(1)	$\chi^2(9) = 10.49$ (0.312)
	LM(2)	$\chi^2(9) = 11.652$ (0.234)
Normality		$\chi^2(6) = 10.49$ (0.000)
ARCH:	LM(1)	$\chi^2(36) = 35.631$ (0.486)
	LM(2)	$\chi^2(72) = 72.994$ (0.445)

Note: p-values in parentheses

Table 3: Johansen's stationarity test

r	DF	*le*	*lU*	*lS*
1	2	0.039	0.006	0.071
2	1	0.154	0.009	0.025

Note: Restricted constant and weakly exogenous variables included in the cointegration relations. P-values are reported.

Table 4: Trace test for the cointegration rank

r	Eigenvalue	Trace	p-value
0	0.104	45.031	0.028
1	0.080	22.321	0.120
2	0.024	5.099	0.545

Table 5: Companion matrix roots (modulus)

r=3	r=2	r=1
0.993	1.00	1.00
0.993	0.990	1.00
0.961	0.961	0.962
0.915	0.961	0.962
0.915	0.908	0.959
0.909	0.893	0.932

Figure 1: Marxian Exploitation in the UK: 1955-2008

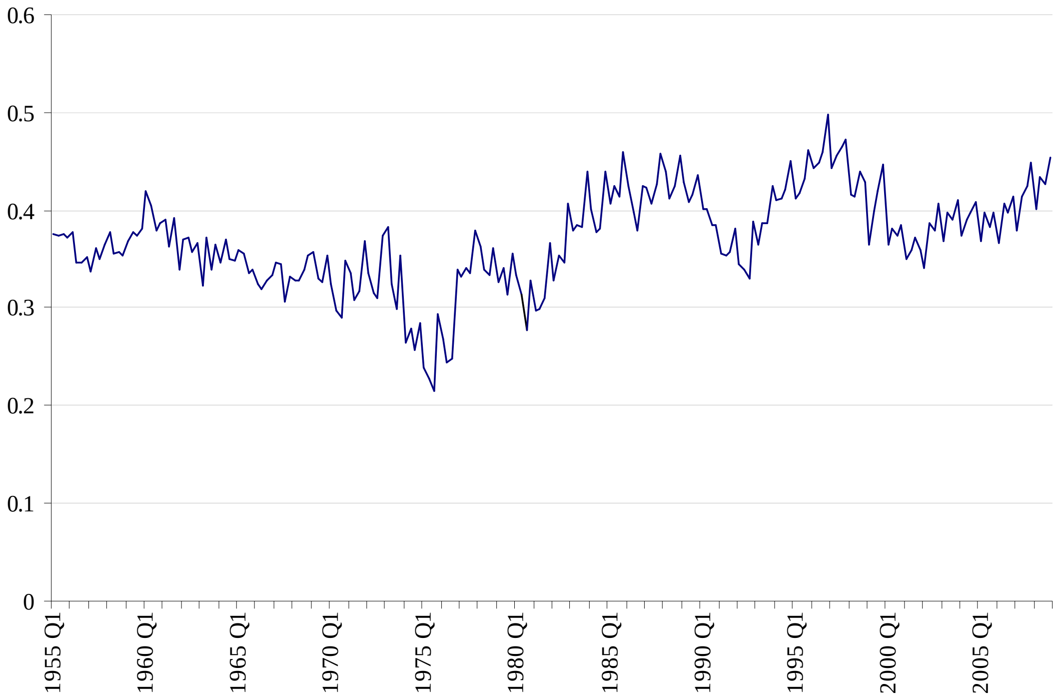


Figure 2: Cointegrating relationship

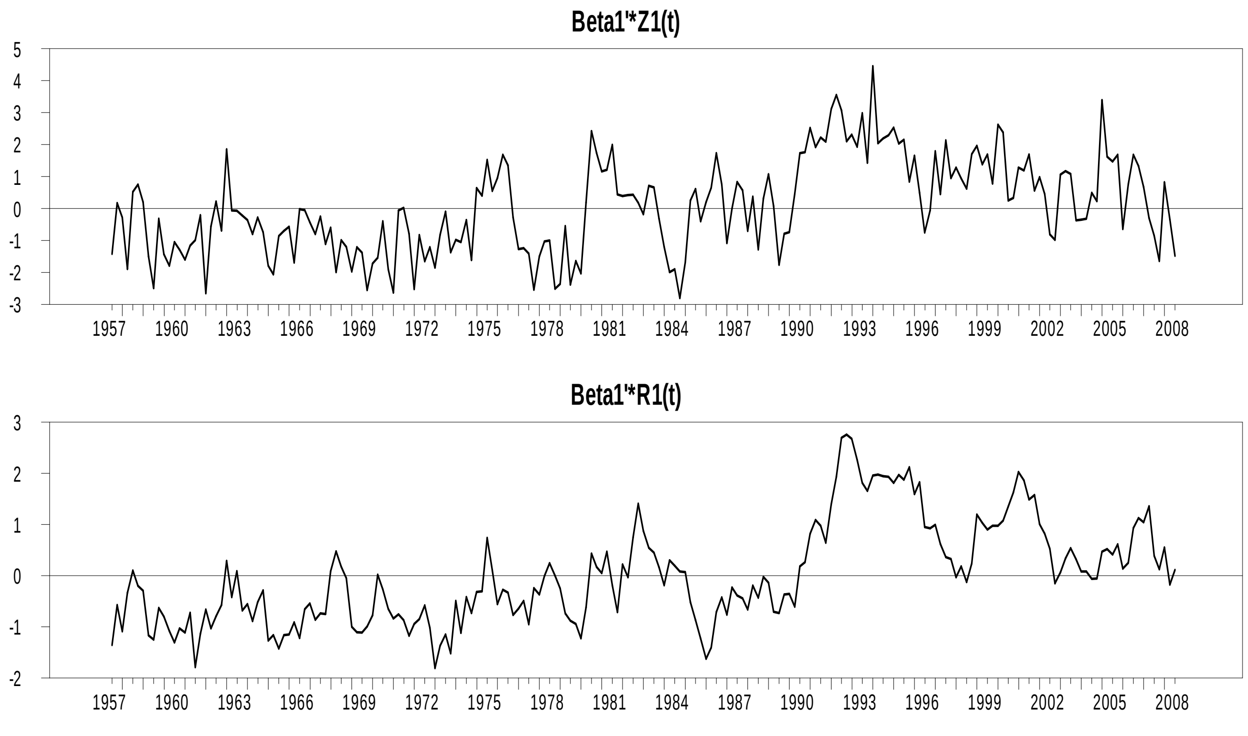
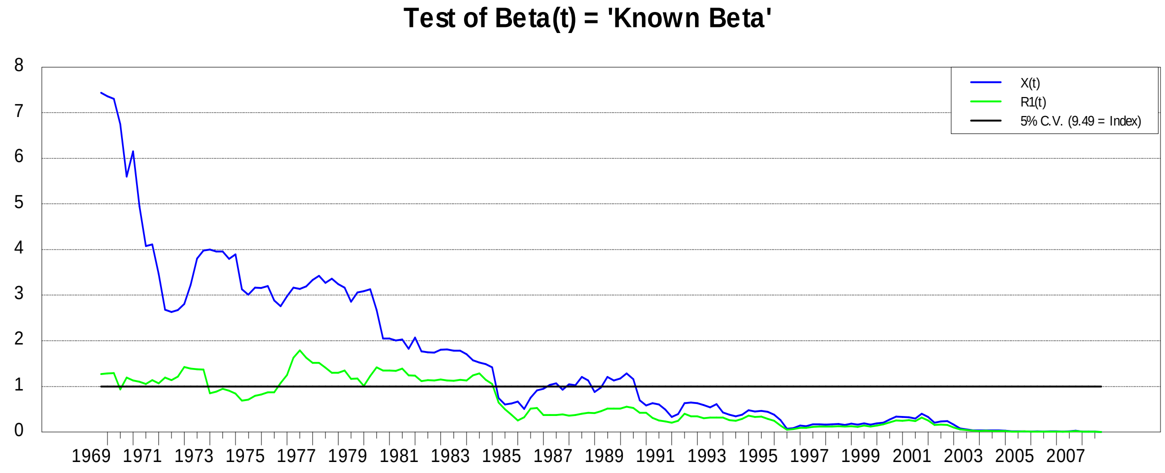


Figure 3: Test for beta and alpha constancy



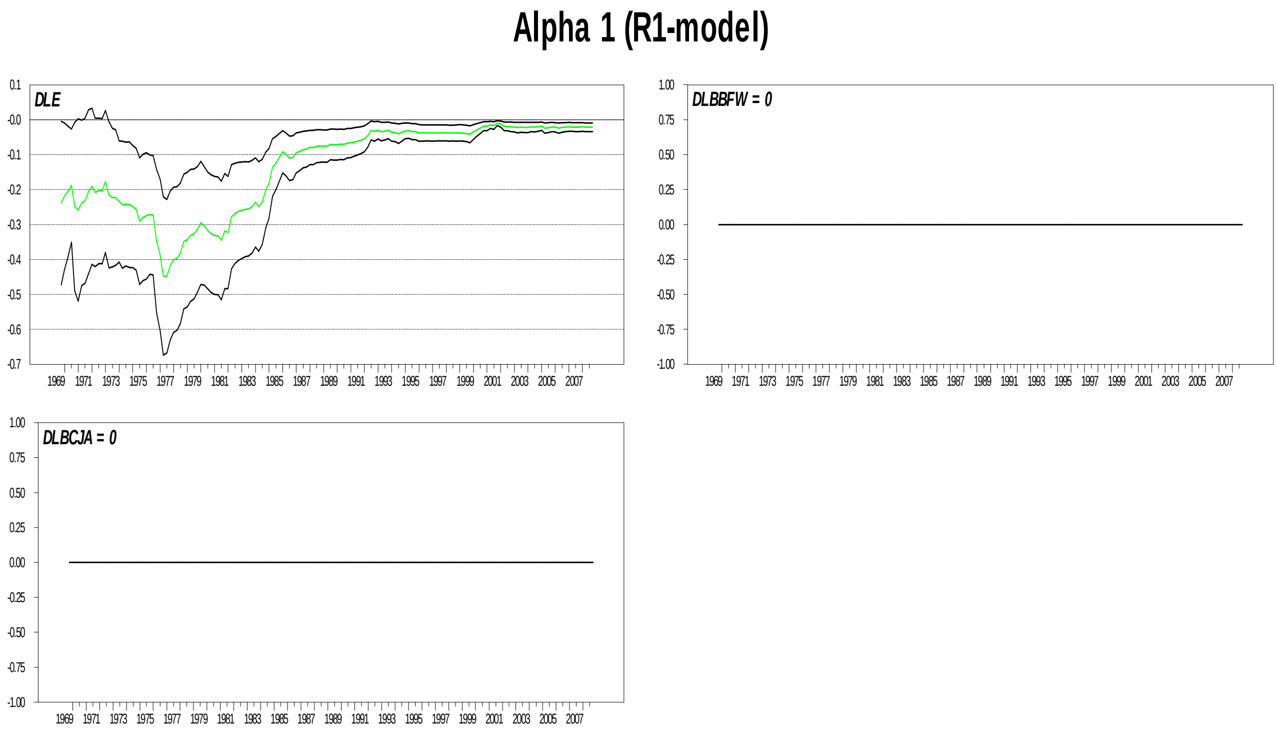
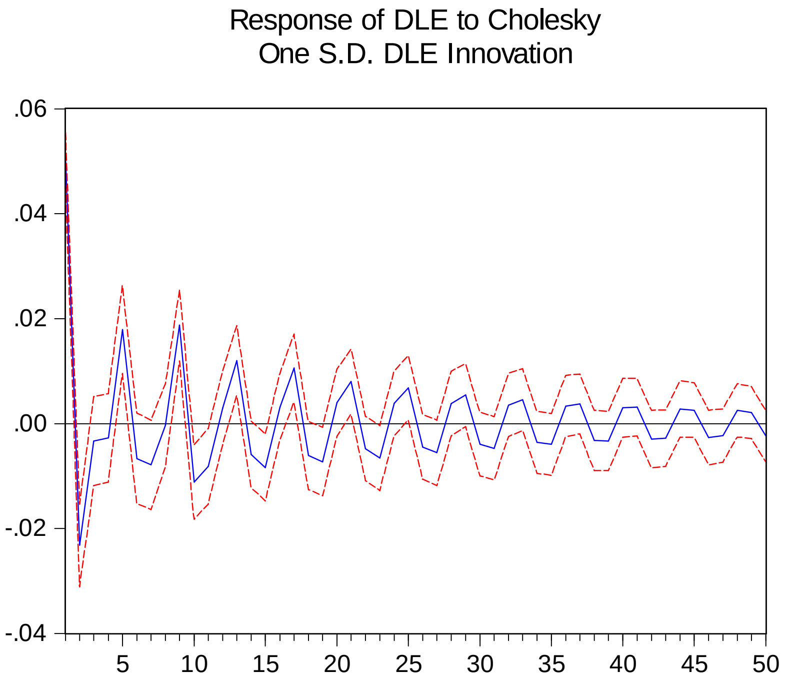


Figure 4: Impulse-response analysis



Appendix 1: Exploitation Statistics Quarterly UK (None Seasonally Adjusted)

Abbreviation	**Definition**	**Source**
NQNV	Gross Operating Surplus: Financial Corporations: Total: CP NSA	Blue Book
NRJK	Gross Operating Surplus: NFCos: Private: Current price: NSA	Blue Book
NRJT	Gross Operating Surplus: NFCos: Public: Current price: NSA	Blue Book
HAEA	Income based: UK: Uses: Total compensation of employees:D.1: CP NSA	Blue Book
Exploitation (e)	(NQNV+NRJK+NRJT)/HAEA	Derived
P	The political party in government for all or most of the quarter.	House of Commons Library, Social and General Statistics Section, Election Statistics: UK 1918-2007 (Edmund Tetteh)
S (BBFW)	Aggregate Strike Days	Department for Business, Enterprise and Regulatory Reform (2009) Trade Union Membership 2008. National Statistics
U (BCJA)	Claimant count (UK) – thousands NSA Because of industrial action by employment staff the figure in December 1974 was not collected, so the 1974, Q4 figure is the average of the October and November claimant count. November 1976 was the same, thus 1976, Q4, was a two-month average. Due to industrial action the January 1975 and December 1976 are estimates.	Department of Employment and Productivity (1971) *British Labour Statistics Historical Abstract 1886-1968*. London: HMSO. Department of Employment and Productivity (1969) *Employment and Productivity Gazette*. London: HMSO. Department of Employment (1970-1978) *Department of Employment Gazette*. London: HMSO. Department of Employment (1979-1983) *Employment Gazette*. London: HMSO. (1984-2009) http://www.statistics.gov.uk/STATBASE/tsdataset.asp?vlnk=430&More=Y [accessed 12th August, 2009]

Appendix 2: Coefficients for the short run matrices (t-statistics)

LAGGED DIFFERENCES:

GAMMA(1)

	DLe{1}	DLU{1}	DLS{1}
DLe	-0.451	0.135	0.014
	(-6.397)	(2.540)	(2.766)
DLU	0.105	0.449	-0.005
	(1.110)	(6.296)	(-0.738)
DLS	0.744	-1.594	-0.535
	(0.640)	(-1.822)	(-6.328)

GAMMA(2)

	DLe{2}	DLU{2}	DLS{2}
DLe	-0.250	0.043	0.020
	-(3.292)	(0.757)	(3.614)
DLU	-0.103	-0.062	-0.005
	(-1.009)	(-0.801)	(-0.662)
DLS	-0.561	0.722	-0.410
	(-0.447)	(0.763)	(-4.513)

GAMMA(3)

	DLe{3}	DLU{3}	DLS{3}
DLe	-0.214	-0.050	0.018
	(-2.840)	(-0.886)	(3.130)
DLU	-0.050	0.093	-0.003
	(-0.494)	(1.218)	(-0.443)
DLS	-2.117	-1.289	-0.368
	(-1.704)	(-1.373)	(-3.884)

GAMMA(4)

	DLe{4}	DLU{4}	DLS{4}
DLe	0.185	0.092	0.016
	(2.463)	(1.688)	(2.648)
DLU	-0.031	0.164	0.007
	(-0.308)	(2.237)	(0.826)
DLS	0.870	0.906	-0.452
	(0.701)	(1.006)	(-4.666)

GAMMA(5)

	DLe{5}	DLU{5}	DLS{5}
DLe	0.084	0.115	0.012
	(1.140)	(2.136)	(2.039)
DLU	-0.265	-0.123	0.001
	(-2.2664)	(-1.702)	(0.120)
DLS	1.393	0.512	-0.230
	(1.141)	(0.578)	(-2.306)

GAMMA(6)

	DLe{6}	DLU{6}	DLS{6}
DLe	-0.091	0.040	0.006
	(-1.295)	(0.744)	(1.071)
DLU	0.045	-0.192	0.011
	(0.478)	(-2.621)	(1.364)
DLS	0.149	-0.459	-0.165
	(0.128)	(-0.511)	(-1.750)

GAMMA(7)

	DLe{7}	DLU{7}	DLS{7}
DLe	-0.052	0.214	0.007
	(-0.749)	(3.846)	(1.371)
DLU	-0.088	-0.043	0.009
	(-0.936)	(-0.578)	(1.308)
DLS	1.436	-0.777	-0.213
	(1.248)	(-0.847)	(-2.407)

GAMMA(8)

	DLe{8}	DLU{8}	DLS{8}
DLe	0.140	0.050	0.009
	(1.987)	(0.858)	(1.784)
DLU	0.099	0.199	-0.003
	(-1.039)	(2.565)	(-0.501)
DLS	0.672	0.314	-0.153
	(0.576)	(0.330)	(-1.838)

GAMMA(9)

	DLe{9}	DLU{9}	DLS{9}
DLe	0.040	0.048	0.005
	(0.592)	(0.872)	(1.123)
DLU	-0.072	-0.155	0.000
	(-0.799)	(-2.099)	(0.017)
DLS	0.089	1.163	-0.047
	(0.080)	(1.280)	(-0.654)

WEAKLY EXOGENOUS/FIXED VARIABLES:

Time t-0

	DP
DLe	-0.004
	(-0.187)
DLU	-0.011
	(-0.354)
DLS	-0.036
	(-0.096)

Time t-1

	DP{1}
DLe	0.036
	(1.632)
DLU	-0.017
	(-0.555)
DLS	-0.975
	(-2.671)

Time t-2

	DP{2}
DLe	-0.017
	(-0.749)
DLU	-0.036
	(-1.196)
DLS	-0.168
	(-0.454)

Time t-3

	DP{3}
DLe	-0.005
	(-0.245)
DLU	0.005
	(0.174)
DLS	-0.185
	(-0.508)

Time t-4

	DP{4}
DLe	-0.007
	(-0.325)
DLU	-0.026
	(-0.888)
DLS	0.497
	(1.388)

Time t-5

	DP{5}
DLe	0.007
	(0.337)
DLU	-0.001
	(-0.044)
DLS	-0.041
	(-0.113)

Time t-6

	DP{6}
DLe	0.011
	(0.497)
DLU	-0.055
	(-1.890)
DLS	-0.203
	(-0.565)

Time t-7

	DP{7}
DLe	0.035
	(1.618)
DLU	0.066
	(2.240)
DLS	-0.179
	(-0.497)

Time t-8

	DP{8}
DLe	-0.003
	(-0.123)
DLU	0.038
	(1.270)
DLS	0.011
	(0.030)

Time t-9

	DP{9}
DLe	-0.006
	(-0.251)
DLU	-0.019
	(-0.637)
DLS	0.333
	(0.908)

CENTERED SEASONALS

	SEAS1	SEAS2	SEAS3
DLE	0.016	0.034	-0.017
	(0.755)	(1.921)	(-0.833)
DLU	0.099	0.047	0.117
	(3.569)	(1.957)	(4.185)
DLS	-0.227	-0.340	-0.333
	(-0.670)	(-1.162)	(-0.970)

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