Effective Demand and Unemployment.
The European Case: Evidence from Thirteen Countries.

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Abstract: Nowadays, the long-standing relationship between effective demand and unemployment seems to be fading into oblivion. Economic policies designed to boost the components of effective demand are conspicuous by their absence in nearly all European economies. This paper argues that policies tailored to boost effective demand can play an important role in reducing unemployment across Europe, as well as improving economic performance. An analytical framework has been developed which provides a basis for the empirical investigation. A panel data approach has been adopted for testing the hypothesis on 13 EU member states.

1.1. Introduction.

It is beyond any shadow of a doubt that changes in the components of effective demand influence the way the unemployment rate fluctuates in contemporary economies around the world. However, over the last decades, a number of theoretical models emerged, each claiming to have hit upon a solution to the rampant problem of unemployment. In view of these developments, the existing relationship between effective demand and unemployment appeared to have been fading into oblivion. This paper seeks to restore the significance of this relationship by arguing that the components of effective demand can have adverse effects on the employed population of EU member states when deflationary policies, such as the ones implied by the Maastricht's convergence criteria, start to hold sway. The contractionary nature of the Maastricht rules which impact on the aggregate demand components which in turn negatively affect the unemployment rate, is the hypothesis which will act as the reference point for conducting the empirical analysis. The rest of the paper is organised as follows: Section 1.2 very briefly touches upon some of the most prominent theories of the causes of unemployment. Section 1.3 provides the theoretical framework on which the empirical investigation is based. Section 1.4 dwells upon the econometric methodology adopted for the estimation. Section 1.5 elaborates on the results generated while section 1.6 concludes.

1.2. Explaining Variations in the Unemployment Rate.

Over the last two decades, several theories have emerged in an attempt to explain the high and seemingly persistent levels of unemployment in OECD countries, and especially in Europe. Econometric models based on these theories have generated confusing evidence as to what variables should be held accountable for this upward trend. The bulk of these theories[1] regard imperfections in goods and labour markets as the major culprit behind the rise in unemployment. One important element that these theories seem to have in common is the notion that low frequency movements in unemployment, or the NAIRU, are attributable to structural[2] variables, such as unemployment benefits, taxes, real interest rates, etc. whereas high frequency[3] movements in unemployment are determined by wage and price changes.

A predominant view as to what extent aggregate demand affects unemployment is that aggregate demand shocks can only affect unemployment, provided that they generate wage[4] and price expectational errors.

Unlike the mainstream approach to explaining unemployment, an alternative strand of thought seeks justifications through analysis of the pressure that demand side factors[5] exert on employment.

1.3. Analytical Framework.

This paper develops an analytical framework which investigates the notion that the nature of macroeconomic policy conditions aggregate demand. Following the Post Keynesian, Kaleckian tradition, it is argued that the type of economic policy - as reflected by both monetary and fiscal policies - can play a significant role in determining the economic conditions that promote full employment, and therefore economic, and social stability. In this sense, restrictive macroeconomic policies cause unemployment via their effect on aggregate demand.

In addition, income policies are also central to this analysis, in so far as income distribution is inextricably linked with aggregate demand and therefore with unemployment. The reasoning behind this draws heavily on the notion that an increase in profits will shift income distribution away from wage earners, and therefore reduce aggregate demand. Such a mechanism can be represented by the following set of equations:

$$(\theta PK) / (PY) = \varphi / (1 + \varphi) \qquad (1)$$

$$(WN) / (PY) = 1/ (1 + \varphi) \qquad (2)$$

Following the pricing rule we can obtain the share of profits[6] in the value of output which is given by equation (1), and the wage share[7] which is given by equation (2). Both equations suggest that increases in the realized mark-up[8] lead to an increase in profit share at the expense of wage share. In other words, income distribution[9] is basically determined by the mark-up.

Since our main theoretical framework is predicated on the contention that the components of aggregate demand condition the level of employment, this econometric model flows from a set of equations, of which the following one is part of:

$$(x_0 + x_1\theta - x_2 i) + \sigma + (c_0 - c_1\xi) = \lambda_1\theta + \lambda_2 (WN / PY) \ldots\ldots\ldots\ldots\ldots\ldots (3)$$

Equation (3) is the goods market equilibrium[10]. It equates the aggregate demand injections to national savings. The left hand-side comprises investment , which depends positively on the profit rate θ, and negatively on interest rates i; net government expenditure σ; and net exports which depend negatively on exchange rates ξ. The right hand-side represents the total national savings[11] from profits and wage income.

The following equation relates unemployment to a number of demand-side variables.

$$U = U(\underset{-}{l}, \underset{+}{b}, \underset{+}{i}, \underset{+}{m}) \qquad (4)$$

Equation (4)[12] states that the unemployment rate *(U)* depends negatively on income distribution which is measured by the actual labour share of output *(l)*[13]; positively on government budget surplus *(b)*; positively on the interest rate *(i)*[14], and positively on imports[15] *(m).*

In this particular model, the interest rate *i*[16], rather than money supply, as in mainstream economics, has been used as the monetary instrument. What follows next, is the introduction of a dummy[17](country-specific effect) variable D_j. In this case, the fact that the sign of the dummy variable is expected to be of a positive nature suggests that the convergence criteria have had an adverse effect on European employment. Taking this into account, the revised version of equation (4) takes the following form.

$$U = \beta_0 - \beta_1 (l) + \beta_2 (b) + \beta_3 (i) + \beta_4 (m) + \beta_5 D ,$$

1.4. Panel Data Analysis.

In order to conduct the econometric investigation, panel data analysis has been adopted. In a nutshell, the term "panel data" refers to the pooling of observations of countries, etc. over several time periods (Baltagi 1995). Prior to estimating this model, it is important that a distinction is made between the models involved in panel data analysis and the concomitant variations peculiar to them.

Models of Panel Data:

For the estimation of the model a data-set has been used, which consists of N cross-sectional units, denoted $i = 1,\ldots,N$, observed at each of T time periods, denoted $t = 1,\ldots,T$. There are a total of TN observations where y is a $(TN \times 1)$ vector of endogenous variables, and X is a $(TN \times k)$ matrix of exogenous variables which does not include a column of units for the constant term. In this context, annual data for 13 EU[18] countries from 1961 to 1998, $(so\ N = 13;\ T = 37)$ has been used.

The generalized regression model provides the basic framework:

$$y_{it} = \alpha_i + \beta_i' x_{it} + \varepsilon_{it}, \qquad (a)$$

$$\varepsilon_{it} \sim i.i.d.\ (0.\sigma_i^2).$$

where α_i is a scalar, and β_i is a $(k \times 1)$ vector of slope coefficients. Similar variances between countries, i.e. .$\sigma_i^2 = \sigma_\varepsilon^2$ $\forall$I, have bben assumed, together with zero covariances between countries i.e. $Cov(\varepsilon_{it}, \varepsilon_{js}) = 0$ for $i \neq j$.

A distinction is made between three cases of (a):

(i) The pooled model

When both α and β are common between regions, it is a pooled model:

$$y = \iota\alpha + X\beta + \varepsilon, \qquad (b)$$

where ι is a $(TN \times 1)$ column vector of ones. For this simple model, the Generalized Least Squares estimator reduces to pooled Ordinary Least Squares (OLS).

(ii)The fixed effects model

The fixed effects (or least squares dummy variables model, or within model) is based on the notion that differences across countries can be captured in differences in the constant term:

$$y_{it} = \alpha_i + \beta' x_{it} + \varepsilon_{it}, \qquad (c)$$[19]

The fixed effects model is a reasonable approach when the differences between countries can be confidently viewed as parametric shifts of the regression function.

(iii) The Random effects model

If it is believed that sampled cross sectional units are drawn from a large population, it may be more appropriate to use the random effects model (or variance components model), in which individual constant terms are randomly distributed across cross sectional units:

$$y_{it} = \alpha + \beta' x_{it} + \mu_i + \varepsilon_{it}, \qquad (d)$$[20]

where $E(\mu_i = 0)$, $E(\mu_i^2) = \sigma_\mu^2$, $E(\mu_i \mu_j) = 0$ *for* $i \neq j$, *and* $E(\varepsilon_{it} \mu_j) = 0$, *for all i.t. and j.* Thus μ_i is a random disturbance which characterizes the *ith* observation and is constant through time; it can be regarded as a collection of factors that are specific to region *i* and are not included in the regression. The above model can be estimated by Generalized Least Squares (GLS).

1.5. Estimation and Testing.

In an endeavour to model the unemployment rate, U_t as a function of a number of demand side exogenous variables, several specifications of equations (b) - (d) following a general to specific approach (see Appendix 5), were estimated. What follows, is a presentation of the equation that was selected on the basis of the Schwarz *(S.I.C)* and Akaike *(A.I.C)* Information criteria[21]:

1.5.1. Fixed Effects Model

$$U_{it} = -1.2\text{E-}05\ \Delta L_{it} + 0.21\ \Delta B_{\text{it}} + 0.26\ I_{it} + 4.9\text{E-}06\ \Delta M_{it} + 4.49\ D_t\ ,$$

$$(2.8\text{E-}06) \qquad (0.08) \qquad (0.06) \qquad (2.3\text{E-}06) \qquad (0.43)$$

(standard errors in parentheses).

$R^2 = 0.61$

S.I.C. = -2.65, *A.I.C.* = - 2.84.

The individual effects and their standard errors were calculated using equation T1, (see Appendix 4) and are reported in the following table:

Table 1.

Country	*Ger.*	*Fra.*	*Ita.*	*Neth*	*Bel.*	*Ire.*	*Den.*
Intercept	3.39	5.89	3.20	2.59	6.19	6.51	4.61
S.E.	0.77	0.95	0.81	0.75	0.91	0.83	1.05
Country	*Spa.*	*Por.*	*Swe.*	*Fin.*	*Aus.*	*U.K.*	
Intercept	11.8	3.15	-0.4	3.66	0.66	2.62	
S.E.	1.04	1.54	0.95	0.91	0.77	0.81	

1.5.2. Random Effects Model

$$U_{it} = 4.04 - 1.2\text{E-}05\ \Delta L_{it} + 0.21\ \Delta B_{\text{it}} + 0.26\ I_{it} + 4.9\text{E-}06\ \Delta M_{it} + 4.50\ D_t\ ,$$

$$(1.39) \quad (2.8\text{E-}06) \qquad (0.86) \qquad (0.06) \qquad (2.2\text{E-}06) \qquad (0.43)$$

(standard errors in parentheses)

$R^2 = 0.61$

S.I.C. = *-0 2.87*, *A.I.C.* = -2.77

1.5.3. Pooled Model

$$U_{it} = 2.66 - 1.5\text{E-}05\ \Delta L_{it} + 0.21\ \Delta B_{\text{it}} + 0.39\ I_{it} + 6.3\text{E-}06\ \Delta M_{it} + 4.90\ D_t\ ,$$

$$(0.70)\quad (3.1\text{E-}06)\qquad (0.12)\qquad (0.06)\qquad (2.8\text{E-}06)\qquad (0.57)$$

(standard errors in parentheses)

$R^2 = 0.25$

S.I.C. = -2.85, *A.I.C.* = -2.81

After applying equations (T) - (T3) (see Appendix 4) the following test statistics were calculated:

$$F(12{,}455) = 23.69,\ \ [p\text{ - }value = 0.00]\ ,$$

$$Hausman\text{ - }test\ [x^2] = 16.75,\ \ [p\text{ - }value = 0.00]\ .$$

The outcome of the preceding tests suggests that the fixed effects model is preferred to the pooled model (*F-test*). Moreover, since the *Hausman - test* cannot accept the orthogonality of the individual effects nor the regressors (at any reasonable size of the test), the fixed effects model is preferred to the random effects one. Additionally, the Akaike Information Criterion favours the fixed effects model, whereas the Schwarz Information Criterion ranks the fixed effects model below both random effects and pooled models.

1.5.4. Interpretation of the fixed effects estimates.

As can be discerned from the preceding empirical results, the fixed effects estimates will be the main point of reference. The relatively high R^2 suggests that variations in the dependent variable are explained rather satisfactorily by variations in the explanatory ones. The estimated parameters display the anticipated signs and all pass the significance test at the 5% level of significance, with the only exception being the ones regarding the intercept estimates of Sweden and Austria, which, according to the t-statistics are found to be insignificant.

In addition, the findings show that a shift in distribution towards labour[22] will in fact have a positive impact on European employment. In this model, such a contention is reflected by the negative and statistically significant coefficient of (L_{it}). Moreover, the estimates of the fiscal (B_{it}) as well as the monetary (I_{it}) parameters[23] -- both positive and significant -- indicate that in the short run[24], any fiscal or monetary contraction such as the one implied by the convergence rules will be pernicious for the working population of Europe. Therefore, the austere economic policies that have been put in place since 1992, to facilitate the transition to EMU, have put an additional strain on policies aimed at sustaining economic growth as well as generating jobs. The next estimated parameter (M_{it}) is a measure of international competitiveness, which in this model is reflected by the volume of imports. The estimated coefficient corresponding to this particular proxy suggests that an increase in the volume of imports will cause unemployment to follow suit. Finally, the fact that the dummy[25] variable was consistently positive and significant throughout all estimated models, indicates the extent to which variations in unemployment can be justified after the signing of the Maastricht Treaty.

1.6. Conclusions

It is beyond any shadow of a doubt that econometric models purporting to investigate unemployment have produced conflicting evidence as to what factors should be held accountable for the variations in unemployment. However, our empirical investigation has produced some significant results, which once interpreted, reinforce the belief that demand side factors can have profound effects on the employed population of a country/region. The theoretical analysis highlights the importance that income distribution may be one of the factors influencing unemployment. The findings suggest that a shift in income distribution towards labour leads to lower unemployment. Moreover, evidence regarding the way fiscal as well as monetary policies are conducted, suggests that in the EU region, expansionary type policies should be adopted to alleviate the persistent problem of unemployment. Throughout this empirical investigation, the deflationary policies that have been fostered after the ratification of the Maastricht treaty are found to add to the existing problem, exerting further pressure on the EU economies.

DATA APPENDIX

U Unemployment rate - OECD, Economic Outlook.

L Compensation of employees paid by resident producers / Gross domestic product - OECD, National Accounts.

B General government budget balance as a percentage of GDP - OECD, Economic Outlook.

I Interest rate.(long-run) - OECD, Main Economic Indicators.

M Imports of goods and services as a percentage of GDP - OECD. Economic Outlook.

D Dummy variable - It takes the value 0 for the years prior to 1992 (ratification of the Maastricht treaty) and the value 1 for the years after.

APPENDIX 1

The profit rate is derived as folllows:

$$PY = wN + \theta PK \qquad (1)$$

where Y is real output, P is the price, w is the wage rate, N is employment, K is the capital stock, and θ is the profit rate.

$$P = (1 + \varphi)W/\delta \qquad (2)$$

Equation (2) is a short run price equation where P is fixed by a mark-up. Where φ is the mark-up rate, w is wages, and δ is the output-labour ratio.

By substitution between (1) and (2) the profit rate can be expressed as

$$\theta = \frac{PY - WN}{PK} = \frac{P\delta N - WN}{PK} = \frac{(\delta P - W)N}{PK} = \frac{[(1+\phi)W - W]N}{PK} = \frac{(W + \phi W - W)N}{PK}$$

$$= \frac{\phi WN}{[(1+\phi)W/\delta]K} = \frac{\phi WN}{[(1+\phi)\frac{W}{\frac{Y}{N}}]K} = \frac{\varphi}{1+\varphi}(Y/K) = \frac{\varphi}{1+\varphi}\omega$$

ω denotes output-capital ratio or capacity utilization.

APPENDIX 2

$$\theta = \{\varphi / (1 + \varphi)\}\ \omega \qquad (3)$$

$$\omega = Y / K \qquad (4)$$

Equation (3) gives the profit rate θ which depends on the mark-up and the capacity utilization ω (eq.4), which is equal to the output-capital ratio.

From (3) and (4) we derive the capital share:

$$\frac{\theta}{\omega} = \frac{\phi}{1+\phi} = \frac{\theta}{\frac{PY}{PK}} = \frac{\theta PK}{PY} = \frac{\phi}{1+\phi}$$

$$y = \delta N \qquad (5)$$

$$P = (1 + \varphi)\ W/\delta \qquad (6)$$

Equation (5) is the aggregate production function whereas equation (6) is the target pricing rule according to which firms set a target mark-up over marginal cost.

By combining (5) and (6) we get the wage share:

$$P = \frac{(1+\varphi)W}{\delta} = \frac{1}{1+\varphi} = \frac{W}{P\delta} = \frac{W}{\frac{PY}{N}} = \frac{1}{1+\varphi} = \frac{WN}{PY} = \frac{1}{1+\varphi}$$

APPENDIX 3

$$y^d = C + I + G + NX$$

$$C = C[(1-k)(WN / PY)]$$

$$I = I(\theta, r)$$

$$NX = NX(\xi)$$

The existing relationships between the components of aggregate demand are given explicitly by the above set of four equations, the combination of which when linearized give the goods market equilibrium equation given below:

$$(x_0 + x_1\theta - x_2 r) + \sigma + (c_0 - c_1\xi) = \lambda_1\theta + \lambda_2 (WN / PY)$$

APPENDIX 4

Equation (c) can be estimated by OLS, after the transformation

$$y_{it} - \bar{y}_i = \beta'(x_{it} - \bar{x}_i) + \varepsilon_{it}, \ (T)$$

where $\bar{y}_i$ *and* $\bar{x}_i$ *are the sample means of* y_i *and* x_i *respectively, i.e*

$\bar{y}_i = \frac{\sum_{t=1}^{T} y_{it}}{T}, \bar{x}_i = \frac{\sum_{t=1}^{T} x_{it}}{T}$. *This implies that for each country (i) the intercept and its variance can be derived from:*

$$\hat{\alpha}_i = \bar{y}_i - \hat{\beta}'\bar{x}_i, and Var(\hat{\alpha}_i) = \frac{\sigma^2}{T} + \bar{x}_i' Var(\hat{\beta})\hat{x}_i. \ (T1)$$

Let S_1 *denote the residual sum of squares of (a)* $S_1 = \sum_{i=1}^{N} RSS_i$, *where* RSS_i *is the residual sum of squares of the ith group). Let* S_2 *and* S_3 *denote the residual of sum of squares of models (b) and (c) respectively.*

Testing the pooled model (b) against the fixed effects model (c):

H_0 : $\alpha_1 = \alpha_2 = \ldots = \alpha_N$ *,(homogeneous intercepts conditional on homogeneous slopes),*

$$F = \frac{(S_2 - S_3)/(N-1)}{S_3/(TN - N - k)} \sim F(N-1, TN-N-k) \ (T2)$$

The transformation of the variables for GLS is given by:

$$y_{it} - y_i^* = \alpha^* - \alpha + \beta'(x_{it} - x_I),$$

where $y_i^* = (1-\sqrt{\theta})\bar{y}_i, \alpha^* = (1-\sqrt{\theta})\alpha, x_i^* = (1-\sqrt{\theta})\bar{x}_i, and \theta = \frac{\sigma_i^2}{\sigma_\varepsilon'' + T\sigma_\mu''}$.

To compute θ, we use the variance of the fixed effects model (c) as an estimate of σ_ε^2 ; the difference between the variances of the pooled regression (b) and the fixed effects model (c), is taken as an estimate of σ_μ^2 . When $\theta = 0$, the random effects model (d) is reduced to the fixed effects model (c). When $\theta = 1$, model (d) reduces to the pooled model (b).

The Hausman test is a chi- squared test based on the Wald criterion:

$$W = \left(\hat{\beta}_3 - \hat{\beta}_4\right)' \left(\hat{\Sigma}\right)^{-1} \left(\hat{\beta}_3 - \hat{\beta}_4\right) \sim X^2\ (k), (T3)$$

where $\hat{\Sigma} = Var\left(\hat{\beta}_3\right) - Var\left(\hat{\beta}_4\right) and \hat{\beta}_3, \hat{\beta}_4$ *are the estimators of equation (c) and (d) respectively.*

APPENDIX 5

Table 1: Dependent Variable is U_{it}

	Pooled (1a)	**Fixed Effects (1b)**	**Random Effects (1c)**
C	2.66		4.04
	(0.70)		(1.39)
ΔL_{it}	-1.5E-05	-1.1E-05	-1.2E-05
	(3.1E-06)	(2.8E-06)	(2.8E-06)
ΔB_{it}	0.22	0.21	0.21
	(0.12)	(0.08)	(0.09)
I_{it}	0.40	0.26	0.26
	(0.06)	0.05	(0.06)
ΔM_{it}	6.2E-06	4.8E-06	4.9E-06
	(2.8E-06)	(2.2E-06)	2.2E-06
DUM	4.90	4.49	4.50
	(0.57)	(0.43)	(0.43)
SIC	-2.85	-2.65	-2.87
AIC	-2.81	-2.84	-2.78

(standard errors in parenthesis)

Table 2: Dependent Variable is U_{it}

	Pooled (2a)	**Fixed Effects (2b)**	**Random Effects (2c)**
C	2.91		2.98
	(0.71)		(1.41)
L_{it}	-1.3E-06	2.4E-08	-5.1E-08
	(4.8E-07)	(6.7E-07)	(6.5E-07)
B_{it}	0.12	0.27	0.26
	(0.08)	(0.07)	(0.07)
I_{it}	0.35	0.32	0.33
	(1.1E-06)	(0.06)	(0.06)
M_{it}	1.1E-06	1.4E-07	1.9E-07
	(5.1E-07)	(7.3E-07)	(7.0E-07)
DUM	4.97	4.12	4.16
	(0.61)	(0.49)	(0.49)
SIC	-2.83	-2.39	-2.41
AIC	-2.76	-2.18	-2.18

(standard errors in parenthesis)

Table 3: Dependent Variable is U_{it}

	Pooled (3a)	**Fixed Effects (3b)**	**Random Effects (3c)**
C	3.01		4.72
	(0.71)		(1.44)
ΔL_{it-1}	-1.4E-05	-1.2E-05	-1.2E-05
	(3.0E-06)	(2.7E-06)	(2.7E-06)
ΔB_{it-1}	0.35	0.32	0.32
	(0.12)	(0.08)	(0.08)
I_{it}	0.37	0.22	0.22
	(0.06)	(0.05)	(0.05)
ΔM_{it-1}	4.7E-06	3.9E-06	3.1E-06
	(2.8E-06)	(2.1E-06)	(2.1E-06)
DUM	5.07	4.51	4.52
	(0.55)	(0.40)	(0.39)
SIC	-2.84	-2.29	-2.31
AIC	-2.77	-2.08	-2.09

(standard errors in parenthesis)

Table 4: Dependent Variable is U_{it}

	Pooled (4a)	**Fixed Effects (4b)**	**Random Effects (4c)**
C	4.92		7.20
	(0.71)		(1.43)
$(\Delta)L_{it}$	-34.1	-44.8	-44.6
	(4.54)	(3.21)	(3.16)
L_{it}	-1.5E-06	-1.1E-06	-1.1E-06
	4.4E-07	5.4E-07	(5.2E-07)
B_{it}	0.0015	0.12	0.11
	(0.08)	(0.06)	(0.06)
I_{it}	0.51	0.41	0.41
	(0.06)	(0.05)	(0.05)
M_{it}	1.1E-06	6.1E-07	6.2E-07
	(4.7E-07)	(5.7E-07)	(5.6E-07)
D	3.35	2.33	2.35
	0.60	(0.41)	(0.40)
	SIC: -2.74 *AIC*: -2.66	*SIC*: -2.98 *AIC*: -1.76	*SIC*: -2.00 *AIC*: -1.77

(standard errors in parenthesis)

Table 5: Dependent Variable is U_{it}

	Pooled (5a)	**Fixed Effects (5b)**	**Random Effects (5c)**
C	4.39		4.0
	(0.75)		(1.38)
L_{it}	-3.9E-07	1.8E-06	1.6E-07
	(5.9E-07)	(7.1E-07)	(6.8E-07)
B_{it}	0.16	0.33	0.32
	(0.09)	(0.08)	(0.08)
I_{it}	0.26	0.24	0.23
	(0.07)	(0.07)	(0.06)
M_{it}	6.6E-07	-8.4E-07	-7.2E-07
	(5.5E-07)	(7.9E-07)	(7.6E-07)
S.I.C	-2.62	-2.63	-2.67
A.I.C	-2.53	-2.45	-2.47

(standard errors in parenthesis)

Endnotes:

[1] Some of the most prominent general equilibrium models are the ones of Phelps (1994), Layard and Nickell (1986) and Layard, et al. (1991).
[2] Hence, the name "structuralist theories of unemployment" (Phelps 1994).
[3] An additional factor that contributes to the high frequency movements, can also be the cyclical mark-ups (Layard and Nickell 1986).
[4] According to this view, firms will always remain on the labour demand schedule.
[5] In these models imperfections in the goods and labour markets are less important determinants of unemployment.
[6] A similar procedure is fostered by Taylor (1985), and Sarantis (1991). Derivations are provided in Apendix 2.
[7] Under different circumstances equation 2 (see Sarantis 1991) could have accounted for the negative effect -highlighted by Kalecki (1971: p.64) - that the share of imported intermediates has on the labour share.
[8] Mark-up is defined as price over average cost rather than marginal cost. According to Rowthorn (1977) however, mark-ups can be far from exogenous in a sense that the determination of income distribution is the result of class conflicts between the classes.
[9] According to Kalecki (1942) – Kaldor (1955/56) the level of aggregate demand is adversely affected by shifts in the distribution of income that favour profits over wages. Their economic explanation behind such a contention is that marginal propensity to save out of profits exceeds the marginal propensity to save out of wage income. In other words, capitalists have a lower propensity to consume. See also Sawyer (1989), Kuznets (1965).
[10] Appendix 3 provides the formulae on which equation (3) has been based.
[11] λ_1 and λ_2 are the marginal propensities to save out of profits and wages respectively.
[12] Equation (4) is in line with Sarantis' 'stagnationist' model of which the mathematical solutions can be found in Sarantis's (1991). The term stagnationist refers to models which assume that "both the growth rate and the level of capacity utilisation can be different under different conditions of income distribution and/or macroeconomic policy…." (Taylor 1985).
[13] The expected negative sign suggests that a shift in income distribution towards labour, will have a positive effect on capacity utilization (see Dutt 1984, and Sawyer, 1989) and hence, employment.
[14] Due to unprecedented high levels of interest rates, investment rates in the 1980s and 90s were lower than those in the 1960s in more or less in all OECD countries (Rowthorn 1996). Such a downward trend in investment rates may be translated into higher unemployment if the elasticity of substitution between capital and labour is below unity. A failure of capital to keep up with the growth of labour supply will result in falling wage share, and therefore higher unemployment (Nickell 1997).
[15] Unlike Sarantis we have employed imports rather than exchange rates as a measure of international competitiveness. An increase in the volume of imports will have adverse effect on effective demand and thus, employment, mainly, due to the pressure that a shift in expenditure from home-produced goods to foreign commodities entails.
[16] This is in line with the post-Keynesian approach to money and credit, according to which the conviction regarding the mechanism of the creation of loans has been reversed

i.e. it is the bank lending that creates deposits. For further analysis see Palley (1991), Moore (1983), Goodhart (1989), Pollin (1991).

[17] In our model both the monetary and the fiscal variables are sufficient to capture the effects of contractionary policies such as the ones implied by the Maastricht Treaty. However, the introduction of a dummy variable can be regarded as merely an attempt to demonstrate more comprehensively the extent to which employment has suffered after the ratification of the Maastrcht Treaty. .

[18] Due to unavailability of data Luxembourg and Greece are not included in our data set.

[19] See Appendix 4.

[20] See Appendix 4.

[21] We minimize the Schwarz *(S.I.C)* and Akaike *(A.I.C)* Information criteria given by:

$$S.I.C = \frac{k \ln T}{T} + \ln\left(\frac{uu}{T}\right), and$$
$$A.I.C = \frac{2k}{T} + \ln\left(\frac{uu}{T}\right),$$

where *k*, *T*, and *(u u)* refer to the number of parameters, number of observations and the sum of squared residuals of the estimated equations, respectively. Note that Schwarz criterion penalizes more any loss in the degrees of freedom than the Akaike one.

[22] This finding is in line with the traditional under-consumption theory of Post-Keynesianism whilst in conflict with the results generated by Sarantis' model.

[23] Similar results were obtained by McCallum (1986), Layard and Nickell (1985) and Sachs (1983).

[24] The estimated equation reflects short run effects since we have taken the first difference. A point however, that has to be stressed is that even when we excluded the dummy variable from the model, and used levels for our estimation, the coefficients of the policy and monetary parameters were found to exhibit the same consistency in terms of the sign and significance (see Appendix 5).

[25] The consistency regarding the sign as well as the level of significance of the dummy was uniform throughout all models that we estimated.

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