

■ **THE HYPOTHESIS OF ASYMMETRIC INFORMATION: AN
EMPIRICAL EXAMINATION USING GREEK DATA**

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Abstract

The paper examines empirically the assumption of asymmetric information with the use of a simple macroeconomic model. The results, based on Greek data, support the rational expectations models of asymmetric information and therefore the proposition of policy ineffectiveness.

Keywords

Rational expectations, Asymmetric information, Policy ineffectiveness.

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C20, C21, C22

I. Introduction

In the rational expectations literature, the “policy irrelevance” result plays a dominant role. Basically this result indicates that systematic aggregate demand policy has no effect on real variables even in the short-run. Furthermore, the aggregate demand policy can have real effects in the case of alternative information sets among the agents in the economy.

Following the asymmetric information rational expectation models, we define the aggregate demand (AD), and aggregate supply (AS) functions as follows:

$$(AS): y_t = \delta[p_t - E_{t-1}(p_t)] + \varepsilon_t \quad (1)$$

$$(AD): y_t = \vartheta_1(m_t - p_t) + \vartheta_2 E_t[(p_{t+1}) - p_t] + e_t \quad (2)$$

where E is the expectations operator, y is the log of output, m is the log of money supply and p is the price level.

This model implies different information sets for the agents in the demand and supply sectors. Thus, given that assumption of asymmetric information the policy irrelevance propositions follows easily. The intuition behind this result runs as follows. The position of both the aggregate demand and supply schedules depend on expectations, but based on different information sets. Therefore, when the money supply changes, the demand and short-run supply curves shift by different vertical distances so monetary policy matters for determining output.

In the present paper we examine empirically the assumption of asymmetric information. Specifically we investigate using a simple macro model for the Greek economy whether the agents in the AD sector have information advantage over the agents in the AS sector.

II. The model and results

Let consider an agent A who attempts to forecast the r.v. π . The agent A has a limited information set Ω_A . However the true expectations for those who have complete information sets are $E(\pi / \Omega) = \pi^e$. Agent's A expectation about A is $E(\pi / \Omega_A) = \pi_A^e$, where $\Omega_A \subset \Omega$. Gottfries and Persson (1988) showed that the best guess $\hat{\pi}^e$ about π^e given Ω_A , that is $E(\pi^e | \Omega_A) = \hat{\pi}^e$, is given by:

$$\hat{\pi}^e = (1 - \mu)\pi_A^e + \mu\pi \quad (3)$$

From (1) we can say that a rejection of $\mu = 1$ may be interpreted as evidence of significant lags concerning the process of information. We specify the model as follows:

$$(AD): \Delta y_t = \beta_1 \Delta m_t + \beta_2 \Delta \pi_t^e + \varepsilon_t \quad (4)$$

$$(AS): \Delta \omega_t = \gamma_1 \Delta u_t + \gamma_2 \Delta \pi_t^e + e_t \quad (5)$$

where y , m and ω are indices of GDP, money supply and wages. Variable u is the unemployment in percentages, π^e is the expected inflation and Δ stands for the first difference operator.

All variables have been obtained for the OECD data base, the indices are 100 at 1995 and the time period is 1960-1997.

For the expected variable $\Delta \pi_t^e$ we formulated conventional forecasts $\Delta \pi_A^e$ by projecting $\Delta \pi_t$ in an information set containing variables dated in the past, that is $t-1$, $t-2$ etc. Then we formed agents true expectations by using equation (3).

Thus, we specified the equation:

$$\Delta \pi_t = \delta_1 \Delta \pi_{t-1} + \delta_2 r_{t-1} + v_t \quad (6)$$

The OLS estimates of equation (6) are (t-values are in parentheses):

$$\Delta\pi_t = 0.87\Delta\pi_{t-1} + 0.06r_{t-1} \quad (7)$$

(14) (2.53)

R² = 0.95 , F=587(0.00)
 HETER.=1.66(0.198)
 AUTO.C.=1.53(0.126)
 NORM.=120(0.000)
 RESET.=1.1(0.300)

To obtain the final form of our model we inserted the forecasted values of equation 7 into equation 3, substituting the resulting expression into equation 4 and 5, yields:

$$(AD): \Delta y_t = \beta_1 \Delta m_t + \beta_2 [(1 - \mu_{AD}) \Delta \pi_t^e + \mu_{AD} \Delta \pi_t] + \varepsilon_t \quad (8)$$

$$(AS): \Delta \omega_t = \gamma_1 \Delta u_{t-1} + \gamma_2 [(1 - \mu_{AS}) \Delta \pi_t^e + \mu_{AS} \Delta \pi_t] + e_t \quad (9)$$

The equations (8) and (9) were estimated simultaneously with the full information maximum likelihood method.

The estimated coefficients of equations 8 and 9 with their t-statistic are presented in the table below:

β_1	β_2	μ_{AD}
-0.198	0.638	0.988
(2.153)	(4.771)	(2.356)
γ_1	γ_2	μ_{AS}
0.643	1.021	0.738
(2.359)	(19.62)	(5.857)

As we can see all the coefficients are statistically significant. Concerning the μ coefficients both are estimated

fairly precisely. Moreover, only the coefficient μ_{AS} found to be significantly below unity but the μ_{AD} was pretty close to unity. This strongly suggests that there were significant information lags in the AS sector whereas the opposite holds true for the AD sector. Therefore the empirical evidence supports the hypothesis of asymmetric information. Furthermore, it supports the model specification presented by equations 1 and 2 where the agents in the demand sector have information advantages compared to those of the supply sector.

III. Conclusion

In this paper we examined the assumption of asymmetric information concerning the agents of the real and monetary sector of the Greek economy. Using Greek annual data from 1960 to 1997 we specify a simple macroeconomic model to estimate information advantage coefficients for the demand and supply equations. The empirical results supported the hypothesis of alternative information sets for the agents in the demand and supply sectors. Furthermore the agents in the supply side had considerable information lags compared to the agents in the demand side. This evidence supports the rational expectations models of asymmetric information where the "policy ineffectiveness" proposition is based upon.

Bibliography

Gottfries N., T. Persson (1988) "Empirical examinations of the information sets of economic agents", *Quarterly Journal of Economics*, pp. 251-259.

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