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Informal Financing of Small – Medium Enterprise Sector: The Case of Greece

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ABSTRACT

In this paper, we attempt to find a "channel" through which Greek economy can exhibit a relative "resistance" in a credit crunch. For this purpose, we specify an error correction model so as to test the relationship between corporate bank loans and commercial papers comprised of post-dated cheques and bills of exchange. The results show that corporate bank loans and cheques - bills of exchange are substitutes. This finding combined with the fact that in Greece, the issuance of these papers is positively connected with the informal economic activity which in turn rises during economic downturns, has a strong economic implication regarding the ability of Greek economy to partly "amortize" the shocks connected with the current financial crisis.

Keywords: *Corporate Finance, Credit Crunch, Shadow Financing*

1. Introduction

Is there an interrelation between bank loans and commercial papers (cheques, bills of exchange) as a source of external debt financing for firms in Greek economy, and if yes, are they substitutes or complements? Which is the economic intuition between such an interrelation and can it offer a safety net to the current credit crunch? These are the main crucial questions we try to answer in this paper.

One of the main factors which determine the level of "resistency" of an economy in a bank credit crunch is the ability of the economic system to create multiple "channels" of financing and exploit them properly. In modern economies, firms have a variety of debt financing tools at their disposal. However, each of these tools has a different rank in firm's preferences. According to the traditional "pecking order" hypothesis of corporate finance [1], borrowing firms prefer to finance their debts through external resources (securities, bank loans) rather than equity issuance. Equity issuance is less preferred since the funds it provides are generally limited by the scale of expenditures (dividends) and it is considered by investors, as a "bad"

signal for the economic performance and viability of the firm. Hence, firms mainly choose between bank borrowing and debt securities issuance, when it comes to finance their corporate expenditures. Greenspan [2,3], emphasized the importance of such a choice under a credit crisis regime. More specifically, he suggested that there is a rate of substitutionality between the market of bank loans and that of bonds which smoothes the negative impact that a financial crisis has on real economy. On the other hand, Holmstrom and Tirole [4], stressed that "multiple avenues of intermediation" (availability of the aforementioned sources of external debt financing) for corporations are characterized by complementarity. Their analysis is based on a principal-agent problem with monitoring costs. When the supply of intermediary capital falls due to a credit crunch, the quantity of informed (banks) finance which is available to firms decreases. This also means that less uninformed (securities) finance can be attracted since the level of monitoring undertaken is lower[1]. The findings of Holmstrom and Tirole [4], were empirically verified for U.S. economy by Davis and Ioannidis [5].

Gertler and Gilchrist [6], argued that the salutary effects stemming from the substitutionality between the main alternative "channels" of corporate debt financing are limited when the market is dominated by small firms. This occurs, since large firms have access to short-term sources of credit (e.g. commercial papers market) unavailable to

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[1]Uninformed investors are less willing to offer their funds when the level of monitoring connected with the informed finance is low.

Table 1. Greek commercial papers in circulation and bank finance (in million euros)

Year	Bounced cheques	Unpaid bills of exchange	Total	Credit delinquency rates (%)	Nominal estimated amount of cheques and bills of exchange in circulation	Yearly adjustment of (D)	Nominal domestic MFI loans to domestic enterprises
	(A)	(B)	(A)+(B)	(C)	(D)	(E)=(D)/3	(F)
2004	1024.8	169.2	1194	2.64	45227.3	15075.8	4587
2005	1464.4	180.7	1645.1	3.04	54115.1	18038.4	5716.6
2006	1202.1	188.1	1390.2	4.02	34582.1	11527.4	5376.9
2007	921.9	177.5	1099.4	3.57	30795.5	10265.2	13095.3
2008	1291.3	170.2	1461.5	3.73	39182.3	13060.8	15488.7

small firms and therefore they respond more effectively to a cash flow squeeze. In Greece, the market of commercial papers as a source of short-term financing has not been adequately developed. Instead, there is a market of post-dated cheques[2] and bills of exchange. The maturity period of a post-dated cheque is not the date of issue but the due date specified by the drawer.

Transactions through post-dated cheques involve high risk for the payee. Therefore, the operation of this "quasi-commercial" papers market is based on long-term relationships (mutual trust) between engaged parties. This characteristic can be proven quite beneficial for an economy during business cycle downturns. According to a survey conducted by International Monetary Fund in 2006 [7], countries with a higher degree of relationship-based lending (low degree of arm's length transactions) may experience a less sharp decrease in the level of nonresidential business fixed investments during a downward phase of the business cycle. The rationale behind this conclusion is that the lender gives a greater weight to the long-run gains from maintaining an existing relationship with a borrower and thus he provides a short-term assurance that financing will be available in case of a credit crisis. Another advantage of the market of post-dated cheques and bills of exchange compared with the traditional market of commercial papers is that small firms have access to it. One more interesting feature of the Greek market of commercial papers is its positive relation with the size of shadow economy. The fact that post-dated

cheques can be endorsed and transferred by the payee means that the "traces" of a transaction cannot be tracked very easily by tax authorities. Hence, firms have an incentive to evade taxes by issuing iconic invoices. A recent work by Schneider [8], shows that Greece had and still has the largest informal economy between 21 OECD countries over the last twenty years[3].

This result is an indication for the expected large size of the Greek "quasi-commercial" papers market. The above analysis implies that if there is substitutionality between bank loans and post-dated cheques and bills of exchange, then Greek economy may have an arrow left in its quiver against the current financial crisis.

The rest of the paper is organized as follows. In the next section we set out our empirical methodology and give our main empirical results. Section 3 concludes.

2. Quantitative Analysis

In order to conduct our analysis, we obtained monthly data over 2004-2008 (more precisely from 2004/07 to 2008/12) for: 1) bounced cheques and unpaid bills of exchange (in million euros) from Hellenic Credit Profile Databank (Tiresias Bank Information Systems S.A.), 2) Consumer Price Index (CPI) from General Secretariat of National Statistical Service of Greece, 3) outstanding balances (in million euros) of domestic Monetary Financial Institutions (MFI) loans to domestic enterprises and 4) interest rates on euro-denominated loans without a defined maturity by domestic MFIs to euro area non-financial corporations. Data for 3) and 4) were obtained from Bank of Greece (Bulletin of Conjunctural Indicators).

Moreover, we used firms' credit delinquency rates from ICAP Group, in order to calculate the value of commercial papers (cheques and bills of exchange) in circulation[4].

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[2]Post-dated cheques facilitate the interindustry financial relations without being recognized as a formal financial instrument, since cheques are officially defined as a bill of exchange payable on demand. This kind of financial instruments usually "covers" under-the-table real sector financial transactions (shadow economy transactions).

[3]Schneider used the Multiple industries and multiple courses procedure (MIMIC) (for an overview see Aigner *et. al* [9]) and currency demand approach (see Schneider [10]) in order to obtain his estimates about the size of the shadow economy.

[4]We assume that firms' credit delinquency rate is a good approximation of the percentage of bounced cheques and unpaid bills of exchange to commercial papers in circulation.

Table 2. Summary statistics: Monthly RL, RCP and RR data from July 2004 to December 2008

Summary statistics	*RL*	*RCP*	*RR*
No. of observations	54	54	54
Mean	0.746884	1.135214	0.038768
Median	0.620918	1.020567	0.038218
Maximum	4.184875	3.069930	0.052121
Minimum	-2.276165	0.608280	0.026796
Standard deviation	1.102762	0.450345	0.006904
Skewness	0.409230	1.772342	0.158600
Kurtosis	4.146723	7.768323	2.069039
Jarque-Bera	4.465909	79.42880	2.176434
J-B P-value[y]	0.107211	0.000000	0.336817

[y] J-B P-value is the probability that a Jarque-Bera statistic exceeds (in absolute value) the observed value under the null hypothesis of a normal distribution. The negative minimum value of *RL* implies that the amount of new loans given is less than the part of the past loans which are paid off.

Table 3. Stationarity tests

	ADF test (lags)	
Variables in levels		
RL	**-2.93**	(2)
RCP	**-0.52**	(5)
RR	**-2.59**	(3)
Variables in first difference		
RL	-12.14[***]	(1)
RCP	-5.92[***]	(2)
RR	-6.65[***]	(0)

Notes: Boldface values denote sampling evidence in favour of unit roots. [***]Signifies rejection of the unit root hypothesis at the 1% level of significance. The numbers in parentheses for the ADF test are the optimal lag lengths, which are determined using AIC (Akaike Information Criterion). Trend and constant were included in the test equation.

Three variables are constructed from the above data: *RL*, *RCP* and *RR*, where *RL* and *RCP* are the real new domestic MFI loans to domestic enterprises (this variable is constructed by taking the first differences of 3) and deflating by the CPI) and the real estimated amount of new cheques and bills of exchange issued each month[5] respectively. *RR* denotes the real interest rate on *RL* (*RR* is derived by subtracting inflation rate from 4). Inflation rate is derived by the use of CPI). The variables *RL* and *RCP* are expressed in billion euros. In Table 1, we present a comparison of the two alternative sources of firm's financing examined in this paper; bank loans and the "parallel financial system" of posted-dated cheques and bills of exchange. As we note from Table 1, the Greek "quasi-commercial" papers market plays an important role (almost the same as bank loans) in corporate financing. Moreover,

it can be easily ascertained from Table 1, that the most important component of the Greek commercial papers market is that of cheques.

Table 2 shows the descriptive statistics of the variables under consideration. For *RL* and *RR* series displayed in Table 2, we do not reject the hypothesis of normal distribution at the 10% significance level. The first step of our analysis is to test whether *RL*, *RCP* and *RR* are stationary. Table 3 reports unit root test statistics of the augmented Dickey and Fuller test [11]. The results in Table 3, indicate that all series are non-stationary and contain a unit root. In order to examine whether they are integrated of order one, I(1), we perform the augmented Dickey-Fuller (ADF) test on first differences. The results suggest that all variables are stationary in first differences.

Engle and Granger [12] argued that even if a set of economic series is not stationary, there may exists some linear combinations of the variables that are stationary. If the separate series are I(1) (i.e. non-stationary in their levels but stationary in their first differences) but a linear combination of them is I(0), then these series are cointegrated. If series are cointegrated, an error correction model (ECM) is appropriate for modeling their relation, as suggested by Engle and Granger. More specifically, if a

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[5]We get *RCP* by dividing 1) with the product of firms' credit delinquency rates and CPI and adjusting the result in yearly basis (the amount of cheques and bills in circulation needs to be adjusted in yearly basis, since it is a common practice for the bearer of a cheque to accept a new cheque (bill) of the same amount instead of cashing it in, when the maturity period ends. Hence, if we assume that the mean maturity period of a post-dated cheque (bill) is four months, we have to divide the total amount of Greek commercial papers by three).

group of variables is non-stationary (random walks), then by regressing one variable against the others can lead to spurious results in the sense that conventional significance tests will tend to indicate a relationship between the variables when in fact none exists. This problem can be solved if we use in our modeling process the first differences of the above variables after verifying that these differences are stationary (integrated of order one, I(1), variables). However, even though this approach is correct in the context of univariate modeling [e.g. Autoregressive – Moving Average (ARMA) processes], it is inadvisable when we try to examine the relationship between variables. The main drawback of this, in other respects, statistically valid approach is that it has no long-run solution (common problem in pure first difference models). More specifically, one definition of the long run that is employed in econometrics implies that variables have converged upon some long term values and are no longer changing. Hence, all the first difference terms will be zero and by simply regressing the one against the others gives results which say nothing about whether the variables under consideration have an equilibrium relationship. However, this problem can be overcome by using a combination of the first differenced and lagged levels of cointegrated variables. This formulation is known as an error correction model. Through this model, we can examine the short run dynamic relationship between the variables under consideration by taking into account their deviations from their equilibrium/long run relationship (residuals of the cointegrating regression).

In order to test for cointegration, we use the maximum likelihood methodology proposed by Johansen [13]. According to Johansen a Vector Autoregression (VAR) model of order p, can be written as follows:

$$\Delta Y_t = \mu + \Gamma(L)\Delta Y_{t-p} + \Pi Y_{t-1} + u_t \qquad (1)$$

where Y_t is the vector of RL, RCP and RR, $\mu = (\mu_1, \mu_2, \mu_3)'$, $\Gamma(L)$ is a polynomial of order $p-1$, u_t is a vector of independent Gaussian errors with zero mean and covariance matrix Ω, Δ is the first difference operator and Π is a matrix of the form $\Pi = \alpha\beta'$ where α and β are $3\times r$ matrices each with rank r, with β being the matrix of the r cointegrating vectors (i.e. the columns of β represent the r cointegrating relations) and α being the matrix of adjustment coefficients. As stated above, the existence of cointegration has implications about the way we should model the relationships between RL and RCP, RR.

The results of Johansen cointegration test are presented in Table 4. Since Johansen's procedure is sensitive to the lag length of the Vector Autoregression (VAR) (Banerjee *et al.* [14]), we determine the lag length by using the appropriate criteria.

The max eigenvalue statistic supports the existence of one cointegrating vector. More specifically, the cointegrating equation is:

$$RL = -1.23RCP - 35.52RR \qquad (2)$$

This finding implies that there is a long run equilibrium relationship between RL, RCP and RR. Equation (2) indicates that the real value of newly issued Greek commercial papers in circulation and the real interest rates of corporate bank loans are negatively correlated to the real amount of corporate bank loans (in the long-run), with the estimated coefficients of -1.23 and -35.52, respectively.

Table 4. Johansen cointegration test

Hypothesized # of cointegrated equations (r)	Max eigenvalue statistic	Critical values at 5%
None	31.99**	21.13
At most 1	4.45	14.26
At most 2	2.88	3.84

Note: ** Indicates the rejection of the hypothesis about the number of cointegrated equations at the 5% level. The sequential modified LR test statistic, the final prediction error (FPE) and the Schwarz information criterion indicate that the optimal lag length of the VAR is equal to one. Moreover, the VAR residual Portmanteau test for autocorrelations does not reject the null hypothesis of no residual autocorrelations.

Table 5. TSLS estimates of the ECM

Parameter	Coefficient	t-value
μ	-0.075	-0.364
γ_0	-2.66**	-2.049
δ_0	-56.92	-0.39
θ_1	-1.2***	-7.026
R^2	0.56	

Note: *** and ** denote statistical significance at 1% and 5%, respectively. The following series were used as instruments: $ECT_{t-1}, ECT_{t-6}, ECT_{t-12}, \Delta RCP_{t-1}, \Delta RCP_{t-4}, \Delta RL_{t-12}, \Delta RR_{t-1}, \Delta RR_{t-12}$, constant.

Table 6. Diagnostic tests

	Value of test statistic	*P*-value
JB	5.295	[0.071]
Reset test	0.455	[0.504]
Hansen' s *J* statistic test	5.449	[0.363]
LM_1 / LM_2 test	0.071/1.212	[0.789/0.545]
BDS test		
Dimension		
2	-0.0053	[0.7908]
3	-0.01389	[0.2847]
4	-0.00601	[0.5855]
5	-0.00222	[0.8633]
6	-0.00329	[0.3745]

Note: Figures in brackets represent asymptotic *P* – values associated with the tests. *JB* denotes the Jarque-Bera normality test of errors. The Reset test tests the null hypothesis of functional form misspecification. LM_1 / LM_2 is the Lagrange multiplier test for first and second order serial correlation (under the null there is no serial correlation in the residuals up to the specified order). Hansen' s *J* statistic test is a general version of the Sargan test, a test of overidentifying restrictions (under the null hypothesis the overidentifying restrictions are satisfied). For the relationship between *J* statistic and Sargan test see Murray [15]. Finally the BDS [16] test tests the null hypothesis that the errors are independently and identically distributed (In our test we set the value of distance between the pair of the elements of a time series, equal to 0.7. Since our sample is relatively small, we use bootstrap *P* - values).

As *RL*, *RCP* and *RR* are cointegrated, it is necessary to specify an ECM in order to examine the short-run relationship of these variables. We specify an error correction model of the following type:

$$\Delta RL_t = \mu + \theta_1 ECT_{t-1} + \gamma_0 \Delta RCP_t + \delta_0 \Delta RR_t + \varepsilon_t$$
$$t = 1, 2, ... T \qquad (3)$$

where *ECT* is the error correction term and ε_t is a disturbance term. Since ΔRCP_t and ΔRR_t current values appear in the above equation, Ordinary Least Squares (OLS) estimation produces inconsistent estimators. In order to overcome this problem, we apply a two stage least squares (TSLS) estimation procedure. Table 5 presents the TSLS estimates of Equation (3). Moreover, we check the specification of our estimated model by performing various diagnostic tests. These tests are reported in Table 6. Our results indicate that the ECM seems to be quite well specified and free from specification error.

As we note from Table 5, the coefficient of the *ECT* has the correct sign, is statistically significant and is rather large indicating rapid adjustment of *RL*, *RCP* and *RR* to the proceeding imbalance (ECT_{t-1}) in a short run period.

In order to investigate the relationship between the provision of corporate bank loans and issuance of cheques and bills, we turn our attention to the short-run elasticity.

Table 5, indicates that *γ₀* is negative and statistically significant. More specifically, if the issuance of new Greek commercial papers increases by 100 million euros then the provision of corporate bank loans decreases, ceteris paribus, by 266 million euros within a month. This finding implies that there is substitutionality between bank loans and post-dated cheques and bills of exchange. If we take into consideration that during a credit crunch, there are bank credit shortages, there is a tendency for informal economy to increase [17] and the fact that (as mentioned above) there is a positive relation between the size of Greek commercial papers market and that of shadow economy, then we conclude that Greek economy may alleviate the negative impact of economic downturns caused by financial crisis.

3. Conclusions and Policy Implications

In our analysis, we showed that the Greek market of cheques and bills of exchange can serve as a substitute for bank loans. By combining this result with the distinctiveness in the structure of the commercial papers market in Greece, which allows small firms to have access to short-term funding and the close connection of the size of this market with that of informal economy, we can argue that Greek economy can partly "amortize" the shocks connected with the current financial crisis. Thus, monetary policy exhibits only indirect effects on real enterprise sector. In case of an interest rate fall, someone would expect that the positive effects will find the way out to the real sector. On the other hand, when interest rates rise during a credit crunch due to the segmentation of the financial sector (low interbank and interindustry trustiness), the enterprise sector will substitute the absence of financial credit with interindustry financing. Therefore, the IMF argument, that economies with low degree of arm's length transactions can smooth the negative credit crunch effects and regenerate economic activity during the easing of a credit crisis, is confirmed.

The main deficiency of our analysis is that, although we

have developed our arguments about the positive relation between Greek market of cheques and bills of exchange and informal economic activity by citing the appropriate references, we have not explicitly included the underground economy in our analysis. The estimation and the inclusion of a variable indicating the size of the informal economy in our model can further enhance the robustness of our analytical results. Moreover, the use of dummy variables which will capture the relevant effects during periods of economic turbulence and the expansion of our dataset so as to include the latest available data, will also reinforce our conclusions. All these issues can be considered as topics for future research.

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