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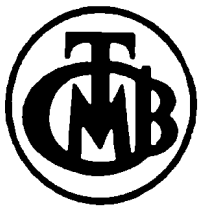

The Determinants and Implications of Financial Asset Holdings of Non-Financial Firms in Turkey: An Empirical Investigation[1]

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ABSTRACT

This paper investigates the determinants and financial crowding out consequences of non-financial firms' holdings of financial assets (FA) including government bonds and securities (GS) in Turkey using the firm level data compiled by the Central Bank of the Republic of Turkey over the 1990-2004 period. The salient features of the Turkish financial system with financial dollarisation and short maturity of financial contracts allowed the corporate sector to remain relatively liquid in spite of high inflation persisting until very recently. Consistent with the presence of capital market imperfections and financial adaptation, the Turkish corporate sector's transactions-cum-precautionary motive-led holdings of the FA as a financial buffer are found to be relatively high and persistent. Contrasting with the transactions-cum-precautionary motive based "economies of scale" argument of the trade-off theory, but reflecting a plausible argument that financial constraints decrease and the ability to allocate resources into financial and real investments increases with firm size, the holdings of FA and GS tend to increase with the firm size both for manufacturing industry and other non-financial firms. The empirical results based on the one-step robust GMM estimations of DPD models suggest that the FA and GS holdings of the corporate sector can be explained by firm-specific characteristics including profitability, leverage ratios, asset tangibility and size along with macroeconomic condition variables represented by uncertainty and real interest rates on GS. The results further suggest that the impacts of these variables significantly vary not only across manufacturing industry and other non-financial firms but also between the large, medium and small sized firms. Under macroeconomic instability leading to excessively high real rate of returns for financial assets, non-financial firms tend to hold FA and GS also for their speculative motive. Consequently, financial assets and real investments may become substitutes rather than complements leading the former to crowd out the latter. The empirical results from a conventional accelerator model of investment augmented with variables representing firms financing conditions and PSBR strongly support such a financial crowding out impact of FA holdings for large sized manufacturing industry firms. For the small and medium sized firms, the positive complementary impact of precautionary and the negative substitution impact of speculative FA holdings are found to offset each other. Consistent with the credit view of the balance sheet literature, real investments of bank-dependent firms decline with an increase in the PSBR potentially due to the fact that government domestic debt is heavily financed via banks, which in turn deteriorates the credit availability for the corporate sector. This provides a further support to the "expansionary fiscal contractions" literature. The sensitivity of investment to cash flow is found to reflect the firms' profitability and investment opportunities which are not fully conveyed by the fundamental Q rather than the degree of financial constraints. This paper also argues that the conventional pecking-order and trade-off theories of the capital structure literature may not be solely adequate in explaining the non-financial firms' behaviour as financial intermediaries in Turkey. This might be the case also the acceleration of the FA holdings of firms in many industrial countries during the last decade in spite of declining financial constraints due to deepening international financial integration. An alternative but not mutually exclusive approach may be treating firms as facing a choice between allocating their resources into financial and real investments. The results of this paper provide a strong support to such an approach and suggest that financial investments may be a substitute or complementary to real investment depending respectively on whether the speculative or transactions-cum-precautionary motive dominates.

I. Introduction

Non-financial (corporate sector) firms hold substantial amounts of liquid financial assets[2] (FA) in many countries (Dittmar *et al*., 2003 and IMF, 2006). According to IMF (2006), the recent acceleration in the FA holdings of non-financial firms in the G-7 countries is one of the striking changes in the global financial landscape. In the conventional Modigliani and Miller (1958) world with perfect capital markets, firms can raise funds instantaneously to finance their profitable projects and thus they may have no uncertainty induced precautionary demand for liquidity. However, as Myers and Majluf (1984) and Holmstorm and Tirole (2000) argue, the presence of capital market imperfections including the informational constraints and asymmetries, credit rationing and moral hazard create a demand for liquid assets. In fact, non-financial firms tend to hold FA including government securities (GS) to hedge themselves against liquidity and interest rate risks and maturity mismatches in an imperfect capital market environment.

There is now a growing body of theoretical and empirical literature attempting to explain the firms' demand for liquid FA[3]. The most liquid financial asset in the firms' portfolio is their instant cash balance (cash in hand and demand deposits with the commercial banking system) the demand for which can be explained by the conventional transactions (Tobin, 1958) and precautionary (Miller and Orr, 1966) motives. The firms' cash holdings, in this context, reduce transactions costs and provide a buffer to absorb adverse shocks (Keynes, 1936). Not only the cash balances but also alternative liquid assets including interest bearing bank deposits and short-term securities can provide a financial buffer to absorb unexpected changes in transactions and investment opportunities. Higher uncertainty concerning macroeconomic stance can also lead firms to hold more short-term FA instead of allocating all their resources into long-term capital investments.

[2] In this paper, "liquid financial assets" refers to currency, deposits with the commercial banking system and short-term securities including government bonds and securities, commercial paper, and certificates of deposits. Data availability often precludes the inclusion of some other liquidity sources such as bank lines of credits. In the literature, liquid financial assets are often referred shortly to as "cash" which may not be the best approach especially when it is intended to differentiate the motives for holding currency and interest bearing short term assets.

[3] The recent contributions include Kim *et al.* (1998), Opler *et al.* (1999), Holmstorm and Tirole (2000), Dittmar *et al.* (2003), Almeida *et al.* (2004, 2006), Özkan and Özkan (2004), IMF (2006) and Baum *et al*. (2006).

The recent studies, the bulk of which are based on the trade off and pecking order theories of the capital structure literature, consider capital market imperfections and information asymmetry induced financial constraints and suggest firm specific characteristics including the firms' size, growth opportunities, profitability, cash flow uncertainty to explain the transactions-cum-precautionary motive of holding liquid FA. The transactions-cum-precautionary motive *per se,* however*,* may not adequately explain the recent acceleration of the excessive FA holdings of non-financial firms in many countries. Alternatively, non-financial firms are in a position of allocating their resources among real and financial investments, as risk factors need to be carefully considered in a competitive market given variety of financial choices (Vickers, 1987 and Holmstorm and Tirole, 2000). By providing the necessary liquidity services due to the transactions-cum-precautionary motive, liquid FA can be complementary to real investments. In this context, liquid FA including government securities may crowd in real investments (Woodford, 1990 and Holmstorm and Tirole, 1998). However, under macroeconomic instability and thus high uncertainty leading to excessively high real rate of returns for FA, non-financial firms may prefer to defer real investments and hold FA also for their speculative motive. In such a case, FA and real investments may become substitutes thus the former may crowd out the latter.

This paper attempts to contribute to this growing literature by investigating the determinants and implications of non-financial firms' holding of FA in Turkey using the firm level data compiled by the Central Bank of the Republic of Turkey (CBRT) over the 1990-2004 period. The Turkish economy, until very recently, can be characterised as suffering from macroeconomic instability and severely high inflation persisted more than three decades. The economy indeed witnessed two financial crises (in 1994 and 2001) with severe output contractions during the period. Under these conditions, as reported by Aydın *et al.* (2006), non-financial firms in Turkey have been heavily exposed almost all of the basic balance sheet risks including excessively high leverage ratios, relatively lower asset tangibility, severely high liability dollarisation and very short debt maturity. The corporate sector can also be characterised as suffering from a general financial constraint as the Turkish bank-based financial system, the deepening of which is very low even when compared to those of the countries with similar development levels, tends to finance public sector deficits with it's rather limited sources (Aydın *et al.,* 2006). These salient features of the Turkish economy

apparently makes it more interesting to investigate the causes and consequences of the corporate sector FA holdings and compare with the growing related empirical literature, the bulk of which are based on advanced industrial countries' data.

The plan of the rest of the paper is as follows. In section II, we discuss the potential determinants of corporate sector liquid FA including government securities. This section considers also the case for a speculative motive for FA holdings, under which the complementarity of the conventional transactions-cum-precautionary motive-led financial investments and real investments may become blurred. Section III presents the data and evaluates some descriptive statistics for some key firm-specific variables postulated to explain the FA holdings of the corporate sector. Section IV empirically investigates the causes of the manufacturing industry and other non-financial firms' holdings of liquid FA and government securities. In Section V we estimate a conventional accelerator model of investment augmented with variables representing firms financing condition and PSBR (public sector borrowing requirement) for the manufacturing firms. The results of the investment equations for different firm size categories are also interpreted in the context of presence of financial constraints, the impact of speculative-led motive holdings of FA and the extent of financial crowding out by government borrowing. Finally, Section VI concludes.

II. The Determinants of Corporate Sector Liquid Financial Assets

Non-financial firms hold substantial and recently accelerating amounts of liquid FA in many countries. Consequently, the causes and consequences of the corporate sector FA holdings has become a central issue of the corporate finance literature. The earlier literature focused mainly on the conventional transactions and precautionary motives for demand for money, the seminal papers for which are provided Tobin (1956) and Miller and Orr (1966). Recent studies, including Kim *et al.* (1998), Opler *et al.* (1999), Dittmar *et al.* (2003) Özkan and Özkan (2004), and IMF (2006) suggest that the corporate FA holdings can be explained also in the context of the two main alternative but not mutually exclusive theories of the capital structure literature: the trade-off and pecking-order theories.

Consistent with the basic postulations of the conventional demand for money literature, the trade-off theory suggests that there is an optimal liquidity ratio target for the firms determined by the relative costs and benefits of liquid FA. While the

opportunity cost of holding liquidity is the difference between the expected returns on FA and productive investments, the benefits are obtained from the liquidity that provides firms with a financial buffer against unexpected cash flows and investment opportunities, i.e. the precautionary motive. Consequently, the FA holdings of firms can be expected to increase with their growth opportunities and cash flow uncertainty and to decrease with their accessibility to capital markets (Kim *et al.* 1998 and Opler *et al.* 1999). The trade-off theory also argues that there is an economies of scale in liquidity so that FA holdings tend to decrease with firm size (Opler *et al.*, 1999).

In the Modigliani and Miller (1958) world with perfect capital markets, there may be no uncertainty induced precautionary demand for liquidity when all firms can raise funds instantaneously to finance their profitable projects. The starting point of both the trade off and pecking order theories based explanations is indeed credit market imperfections due to asymmetric information between borrowers (firms) and lenders. According to the pecking-order theory (Myers and Majluf, 1984; Myers, 2001), the presence of asymmetric information makes external finance costly leading firms to prefer internal over external finance that is subject to a premium resulting from informational problems. Consequently, consistent with the trade-off framework, firms hold FA as a precautionary financial buffer against unexpected cash flows and investment opportunities. As the informational asymmetry and the consequent financial constraint can be expected to decrease with firm size, smaller firms may have higher tendency to hold liquid FA. Considering the reasonable argument that larger firms have a greater access to capital markets, the negative relationship with firm size and FA holdings postulated by both the trade-off and pecking-order theories may be interpreted as observationally equivalent albeit arising from the two distinct postulations[4].

In contrast to the trade-off theory, the pecking order theory based explanations maintain that the firms have no optimal liquidity ratio target which is invariant to their internal cash flows and profitability. Instead, higher profitability and cash flows allow the firms preferring internal finance to increase their liquid asset holdings as a financial

[4] This is consistent with the view that the distinction between the trade-off and pecking-order based postulations "is not as clear-cut as one might want" (Opler *et a.l*, 1999, p.14). These two main alternative theories often make similar postulations about the determinants of the firms' capital structure, making it difficult to compare them empirically.

buffer[5]. Consequently, larger firms with higher profitability may be expected to hold more financial assets. This, however, may make the information asymmetries induced financial constraint based postulation that liquid FA holdings decrease with the firm size blurry if profitability is not controlled.

The recent studies, the bulk of which are based on the trade off and pecking order theories of the capital structure literature, suggest firm specific characteristics including the firms' size, growth/investment opportunities, profitability and cash flow uncertainty to explain the transactions-cum-precautionary motive of holding liquid FA. For example, Kim *et al.* (1998) and Opler *et al.* (1999) consider a sample of US companies and find that firms with smaller size, stronger growth opportunities and more volatile cash flows hold larger amounts of liquid FA. Dittmar *et al.* (2003) focus on corporate governance characteristics and find a negative relation between shareholder protection and cash holdings for a sample of firms from 45 countries. In the same vein, Özkan and Özkan (2004) find a negative non-monotonic relationship between managerial ownership and liquid FA holdings of the UK firms. The results by Özkan and Özkan (2004) are broadly consistent with those in Kim *et al.* (1998) and Opler *et al.* (1999) except the finding that firm size is statistically insignificant for the UK case.

The benefits and costs of holding FA may not be invariant to the firms' capital structures. Therefore, some key capital structure variables including leverage ratio, asset tangibility and debt maturity composition may also be postulated as important determinants of the firms' demand for liquid FA. Leverage ratio may be interpreted as a proxy for the ability of firms to issue debt. Furthermore, the cost of funds used to invest in liquidity tends to increase with leverage ratio (Kim *et al.*, 1998). The consequent negative relationship between leverage ratio and FA holdings may however become blurry if we consider the plausible case that higher debt levels can increase the likelihood of financial distress (John, 1993) and thus the precautionary demand for liquidity. Asset tangibility can mitigate contractibility problem and the firms with more tangible assets can be expected to be less financially constrained as they may have greater access to external funds (Almeida and Campello, 2006 and IMF, 2006). In this context, the transactions-cum-precautionary demand for FA can be expected to

[5] This may be consistent with the fact that non-financial firms in the G-7 countries have preferred to use their substantially increased profits to acquire FA or to repay debt, rather than to finance new capital investments since the early 2000s (IMF, 2006).

decrease with asset tangibility. Short-term debt forces the firm to be more liquid whilst long term debt allows the firm to be more flexible against liquidity shocks (Holmstorm and Tirole, 2000). Furthermore, debt maturity tends to decrease with higher degree of informational asymmetry (Flannery, 1986) supporting the postulation that firms with more short-term debt may be expected to hold more liquid assets.

The firms' demand for FA may crucially be determined also by the macroeconomic conditions under which they operate. The relative real rates of returns on productive investments and financial assets, in this context, may be postulated as an opportunity cost variable to explain firms' FA holdings. The essence of the precautionary demand for FA is the uncertainty that firms may face with. Until very recently, the conventional literature appears to focus solely on firm-specific variables like cash flow volatility as a measure of own (intrinsic) uncertainty and does not explicitly take into account macroeconomic conditions under which the firms operate. However, as Baum *et al.* (2006) argue, liquid FA holdings of firms may be positively related with market (extrinsic) uncertainty represented by the level and volatility of macroeconomic variables including real output and inflation. Macroeconomic instability and uncertainty can lead to excessively high real interest rates for FA including government securities. In such a case, as will be further discussed in the following section, non-financial firms may prefer to defer real investments and hold FA also for their speculative motive.

Non-financial firms can also be viewed to face a choice between allocating their resources into real and financial investments (Vickers, 1987, Ersel and Sak, 1997 and Holmstorm and Tirole, 2000). By providing the necessary liquidity services due to the transactions-cum-precautionary motive, FA can be complementary to real investments as suggested by the conventional capital structure theories. In this context, the holding of liquid FA including government securities can crowd in real investments (Woodford, 1990 and Holmstorm and Tirole, 1998). However, under macroeconomic instability and thus high uncertainty, non-financial firms may prefer to defer real investments and hold FA with relatively higher expected real returns also for their speculative motive. In such a case, FA holdings and real investments may become substitutes leading the former to crowd out the latter[6,7]. In this context, the firms' demand for FA are determined by the mixes of their transactions-cum-precautionary and speculative motives.

[6] Such a financial crowding-out behaviour under uncertainty is neatly emphasized by Vickers (1987): "Money may be held when the uncertainties surrounding economic prospects make it desirable to defer

The empirical literature using firm-level data often does not explicitly take into account the role of government debt instruments in the firms' financial asset portfolios. Government domestic debt finance can either alleviate or relax the firms' financial constraints by draining the available resources in the economy or by providing liquidity services, respectively. A well-developed government debt market is often interpreted as helpful for development of a corporate bond market as it can provide the necessary market infrastructure and investor base along with a reliable benchmark yield curve (IMF, 2005a,b). Government securities, especially those with short maturities, provide liquidity services and can be used as financial collateral. As Woodford (1990) and Holmstorm and Tirole (1998) convincingly show, government debt as net wealth may thus crowd-in private investment by relaxing liquidity constraint in non-Ricardian economies with imperfect financial intermediation. However, these beneficial affects of the government debt may not be invariant to financial depth and to the level (thus the sustainability) and the mode of finance of public debt itself. High levels of government borrowing from domestic markets can drain limited sources that would be available for private investment. This financial crowding out affect might be expected more severe for bank dependent firms when the public debt is financed through the commercial banking system[8]. The lack of an adequate financial depth can create or amplify the crowding out problem as substantially large shares of public debt in the domestic financial system can decrease the overall liquidity with increasing the country risk premium and thus reducing capital inflows (Caballero and Krishnamurthy, 2004). In

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the commitment of resources to real investment and the pursuit of real economic activities. To the extent that this is so, available real resources will not be utilized as fully as would othervise be possible" (p. 11). In the same vein, Ersel and Sak (1997) propose the notion of *uncertainty induced liquidity preference* to explain corporate sector holding of liquid FA including government securities as a financial buffer under conditions of enhanced uncertainty. Accordingly, the "distribution of the working capital between production related assets and financial assets depends upon perceived risks over the production cycle of the corporation" (p.4). The financial crowding out, according to Ersel and Sak (1997), is temporary as firms transfer the accumulated FA to finance real investments to the next production cycle. The empirical results by Ersel and Sak (1997) support the *uncertainty induced liquidity preference* hypothesis for the Turkish data and suggest that non-financial firms holding of government securities not only cushioned the impact of the 1994 crisis but also allowed them to have a faster post-crisis recovery.

[7] The argument about the crowding out affect of the FA holdings of non-financial firms may also be relevant for the recent US experience. According to IMF (2006, p. 136), the recent acceleration of the corporate sector holdings of FA "has offset one-half of the increase in government and household net borrowing, thereby helping to mitigate the impact on the external deficit". IMF (2006) also find that non-financial corporate sector in the G-7 countries accelerated their FA holdings rather than to finance new capital investments during 2001-2004.

[8] Financial deepening and banking system development can potentially limit the crowding out affect (Caballero and Krishnamurthy, 2004). However, as Kuttner and Lown (1999) shows, bank holdings of public debt tend to displace lending to the non-bank private sector even in a country like the US with well developed financial markets.

such a case, fiscal contractions can be expansionary as they alleviate the credit constraint of firms.

III. Financial Asset Holdings of Non-Financial Firms in Turkey: Some Stylised Facts

The Turkish economy, until very recently, might be characterised by severely high inflation rates persisted more than three decades, extremely volatile economic growth and potentially unsustainable budget deficits financed through mainly the domestic commercial banking system with very high real interest rates. The economy indeed witnessed two financial crises (in 1994 and 2001) with severe output costs during the period. Under these conditions, as reported by Aydın *et al.* (2006), non-financial firms in Turkey have been heavily exposed almost all of the basic balance sheet risks including excessively high leverage ratios, relatively lower asset tangibility, severely high liability dollarisation and very short debt maturity. The firms can also be characterised as suffering from a general financial constraint as the Turkish bank-based financial system, the deepening of which is very low even when compared to those of the countries with similar development levels, tends to finance public sector deficits with it's rather limited sources (Aydın *et al.,* 2006).

The causes and consequences of the FA holdings of the corporate sector operating under such salient features of the Turkish financial system may be viewed as a natural research topic to be empirically investigated. To this end, we utilize the firm level database compiled by the CBRT over the 1990-2004 period. We apply a number of sample selection criteria on our original sample of around 160.000 firm-years. First, we restrict our sample to non-financial firms as the behaviour and capital structure of financial institutions under financial regulation are not comparable with those of non-financial firms. From the sample of non-financial firms, we marked non-positive values of total assets, firm-level sample mean employment and net sales as missing. To obtain comparable results, missing firm-year observations for any key firm-specific variable considered in Table 1 during the sample period were dropped. Finally, from these firms, only those with at least three time series observations during the sample were chosen. These criteria have provided us around 75.000 non-financial firm-years, with an average of about 5000 firms per annum. Around half of the firm-year observations belong to manufacturing industry firms. Consistent with the BACH (The Bank of Harmonised Data on Company Accounts) scheme, we classified the firms as small if their sample means of

net sales or total assets are not larger than EUR 7 millions. The firms with sample means of net sales or total assets are larger than EUR 40 millions are classified as large whilst the rest apparently constituting the medium sized firms. Table 1 presents descriptive statistics for the means of the main firm-specific variables used in our analysis.

Figure 1 plots the shares of FA (FAS) of manufacturing industry (Man) and other non-financial (ONF) firms in total assets (TA) during 1990-2004. The figure also presents the shares of government securities (GS) in TA (GSS) during the period. According to Figure 1, the FAS and GSS of manufacturing industry firms tend to be smaller than those for the ONF firms. The differences are statistically significant as suggested by the t_{Man} statistics reported by Table 1. The firms' FAS and GSS sharply increased with the financial crisis of 1994 and tend to remain relatively high until 2001. After the 2001 financial crisis, on the other hand, FAS and GSS appear to be gradually declining. The sharp increase in the FAS during the inter crises period (1994-2001) may be interpreted as being largely due to the shift in their GS portfolios. This preliminary evidence lends a support to the view that non-financial firms hold FA and GS also for their speculative motive under macroeconomic instability and thus high uncertainty.

Figure 1. Financial Assets/Total Assets, %.

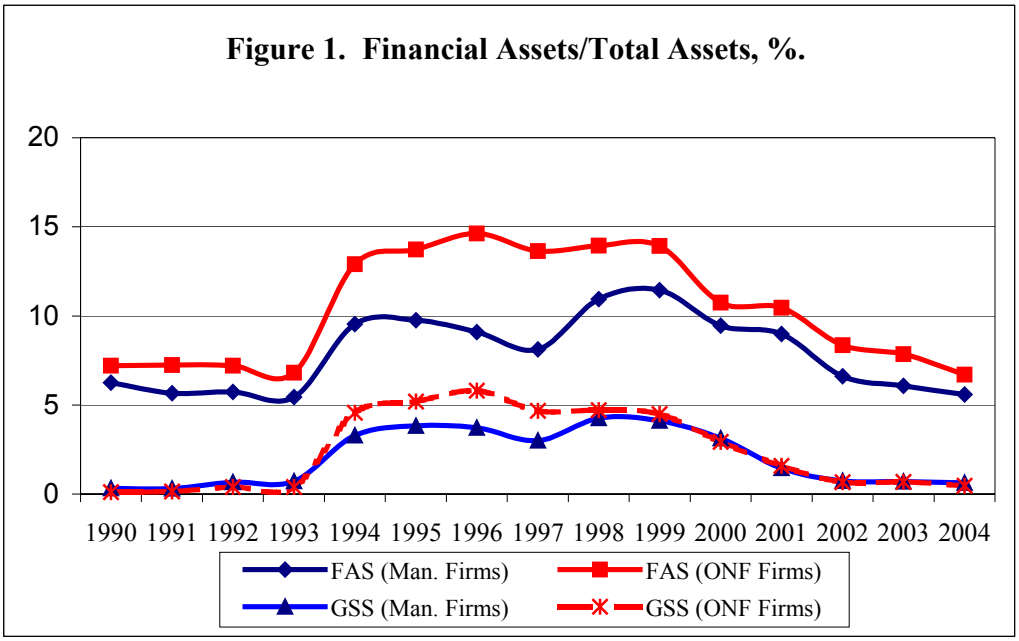

Table 1. Descriptive Statistics for the Key Firm-Specific Variables

	All NF Firms	Man. Firms	Man. Small	Man. Medium	Man. Large	ONF Firms	ONF Small	ONF Medium	ONF Large
N	74461	35741	21009	10901	3831	38720	27756	8003	2961
FAS	7.67 (0.050)	6.94 (0.054)	6.61 (0.070)	7.00 (0.0.98) t_S=3.17*	8.54 (0.178) t_M = 7.51** t_S=9.94**	8.35 (0.070) t_{Man} = 16.2**	8.18 (0.082) t_{Man} = 14.9**	8.84 (0.145) t_{Man} = 10.9** t_S=3.86**	9.18 (0.24) t_{Man} = 2.12* t_M = 1.20 t_S=3.91**
GSS	1.19 (0.021)	1.36 (0.026)	0.90 (0.029)	1.71(0.067) t_S = 13.5**	2.86(0.082) t_M = 10.9** t_S=22.65**	1.03 (0.026) t_{Man} = 8.96**	0.71 (0.027) t_{Man} = 4.77**	1.68 (0.069) t_{Man} = 0.26 t_S=15.6**	2.26 (0.12) t_{Man} = 3.72** t_M = 4.32** t_S=13.08**
COL	22.98 (0.09)	25.67(0.105)	23.72 (0.14)	27.61 (0.19) t_S = 16.8**	30.82 (0.31) t_M = 8.88** t_S=29.97**	20.49 (0.13) t_{Man} = 30.9**	20.74 (0.16) t_{Man} = 13.9**	20.22 (0.29) t_{Man} = 21.6** t_S=1.59	18.85 (0.46) t_{Man} = 21.5** t_M = 2.52* t_S=3.88**
MAT	12.91 (0.09)	13.67 (0.12)	11.40 (0.15)	15.07 (0.20) t_S = 14.6**	22.19 (0.35) t_M = 17.61** t_S=28.49**	12.20 (0.13) t_{Man} = 8.64**	10.60 (0.14) t_{Man} = 3.83**	15.00 (029) t_{Man} = 0.23 t_S=14.4**	19.80 (0.50) t_{Man} = 3.95** t_M = 8.24** t_S=17.64**
PROF	5.63 (0.104)	6.31 (0.135)	6.41(0.170)	5.42 (0.269) t_S = 3.11**	8.30 (0.379) t_M = 6.20** t_S=4.55**	5.00 (0.154) t_{Man} = 6.38**	5.11 (0.194) t_{Man} = 4.86**	4.40 (0.298) t_{Man} = 2.54* t_S=1.80*	5.61 (0.35) t_{Man} = 5.21** t_M = 2.64** t_S=1.25
LR	68.4 (0.155)	63.62 (0.20)	63.47 (0.24)	65.05 (0.43) t_S = 3.22**	60.43 (0.58) t_M = 6.39** t_S=4.82**	72.79 (0.36) t_{Man} = 22.2**	72.34 (0.33) t_{Man} = 20.7**	74.71 (1.30) t_{Man} = 7.05** t_S=2.57**	71.75 (0.78) t_{Man} = 11.6** t_M = 1.95* t_S=0.70
INTINC	8.26(0.26)	8.34(0.35)	5.47(0.39)	10.50 (0.71) t_S = 6.24**	17.85 (1.42) t_M = 4.12** t_S=7.86**	8.18 (0.33) t_{Man} = 0.33	5.06 (0.288) t_{Man} = 0.87	12.93 (0.93) t_{Man} = 2.08* t_S=10.8**	24.67 (2.23) t_{Man} = 2.58** t_M = 4.85** t_S=8.70**

Notes: N is the number of firm-year observations. The values in parentheses are the standard errors for the tabulated sample means of the variables. All the ratios are expressed as the % of the total. t_S and t_M are the absolute value of the t-test statistic for the hypothesis that the mean value of the variable for the sample group defined by the column is not different from that of the small (S) and medium (M) sized firms, respectively. t_{Man} is the absolute value of the t-test statistic for the hypothesis that the mean value of the variable for the sample group defined by the column is not different from that of the manufuctaring industry (Man) firms with the same size category. ** and * denotes the null hypothesis is rejected at the 1 % and 5 % levels, respectively.

The FA holdings of the non-financial firms in Turkey can be interpreted as roughly comparable with many industrial countries when compared internationally[9]. However, the firms' holdings of cash in hand (typically less than 0.5% of their total assets) have been minimal during the period. Under substantially high inflation rates sustained during the most of the period until very recently, economic agents, including non-financial firms, can be expected to minimise their cash (and non-interest bearing demand deposits[10]) holdings. A sustained severe inflationary process in a country may not only preclude domestic fiat money demanded as a store of value, but may also reduce its role as a medium of exchange with the availability of alternative liquid financial assets which can be used as an inflation hedge whilst providing liquidity to a certain extent. This may plausibly explain the minimal holdings of cash by the firms. However, the fact that FAS of the Turkish firms is roughly comparable with those for the countries enjoying much lower inflation and stronger macroeconomic policy stance needs a further explanation.

The salient features of the Turkish financial system may be helpful in explaining the liquid FA holdings of the corporate sector. Under substantially high inflation and macroeconomic instability, the maturity of financial contracts, including government securities and banking system time deposits, have been extremely short in Turkey (Koğar and Özmen, 2006). This financial adaptation allowed the corporate sector to hold interest bearing FA also for their liquidity services. Furthermore, the Turkish banking system is heavily dollarised with foreign exchange (FX) denominated deposits constituting around a half of the total deposits during the period (Yılmaz, 2005 and Akıncı, Barlas-Özer and Usta, 2006). Consequently, non-financial firms in Turkey have been able to hedge themselves against currency risk to a certain extent whilst remaining relatively liquid also by holding FX deposits with the banking system (asset dollarisation).

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[9] For example, Baum *et al.* (2006) report that US and Germany corporations hold around 10% and 6% of their total assets in liquid FA (cash and marketable securities), respectively. Dittmar *et al.* (2003) consider a cross-section of firms from 45 countries and find that the median ratio of liquid FA to net assets (total assets minus cash and marketable securities) is 6.6 %. The median liquid FA ratio reported by Dittmar *et al.* (2003) for some selected countries are as follows: 3.1% (Chile), 6.4% (US), 7.3% (Brasil), 7.4% (Germany), 8.1% (UK), 11.1% (France), 13.4% (Turkey), 15.5% (Japan), and 20.9% (Israel). In the same vein, Himmelberg *et al.* (2003) consider a cross-section of firms from 27 European countries and find that the mean (median) ratio of liquid FA to net assets is 18.0 % (6.4%). The data sets by Dittmar *et al.* (2003) and Himmelberg *et al.* (2003) both show that the FA ratio varies widely across (and within) countries. This suggests that there may be no optimal liquidity ratio for non-financial firms invariant to industry/firm specific characteristics and the prevailing policy stance in the country.

[10] There is no data for the firms' holding of demand deposits with banks. However, it may be plausably expected that the share of domestic currency denominated demand deposits is minimal as for the cash holdings under the severe inflationary period.

The capital structures of the firms, including maturity and currency composition of their debt, are among the important determinants of their demand for FA. High share of short-term debt may make firms be more vulnerable to insolvency and rollover risk especially in the case of an interest rate shocks as cash flow must be available for interest payments. Consequently, firms' demand for liquidity may be expected to decrease with their debt maturity. Table 1 presents also the maturity structure of the corporate sector debt (MAT) measured as the ratio of long-term liabilities to total debt. Accordingly, the bulk of the Turkish corporate sector debt appears to be short-term (with maturity less than a year). Foreign currency denominated short term debt forces the firm the revenue of which is mainly in domestic currency to hold liquid FX assets against a currency risk. As reported by Kesriyeli *et al.* (2005) and Aydın *et al.* (2006) the corporate sector liability dollarisation in Turkey has been severely high with the share of FX denominated debt fluctuating around two third of total debt during the period. Under these conditions, the opportunity costs of remaining liquid by holding TL cash and TL denominated demand deposits have been very high in the face of the sustained high inflation rates during the most of the period until very recently. The short maturity of the financial contracts and asset dollarisation under financial adaptation to high inflation and macroeconomic instability, however, allowed the firms to hold alternative liquid FA making them to be less vulnerable to shocks.

Table 1 presents descriptive statistics also for some other firm-specific variables which are amongst the potentially most important determinants of the corporate sector FA holdings. Manufacturing industry firms appear to have relatively lower leverage ratios (LR, measured as debt over total assets) than the other non-financial (ONF) firms. Consistent with the view that large firms tend to prefer internal funds and small firms may more likely to be financially constrained (Myers and Majluf, 1984), the medium sized firms appear to have the highest leverage ratios. The large sized manufacturing firms have significantly smaller LR compared to the others during the period. For both manufacturing and ONF firms, the debt maturity (MAT) improves with firm size as expected. Asset tangibility which is a proxy for the *collateral* (COL, defined as the ratio of net tangible fixed assets to total assets) levels of the firms is significantly higher for manufacturing firms than the ONF firms. The collateral ratios appear to be monotonically increasing with the size of the manufacturing firms. For the ONF firms, on the other hand, large sized firms have significantly lower asset tangibility than the small and medium

sized firms[11]. The large sized firms have the highest profitability ratios (PROF, as measured by return on assets) whilst the manufacturing firms tend to be more profitable than the ONF firms.

An important preliminary result from Table 1 is that FAS and GSS tend to increase with the manufacturing industry firm size. For the ONF firms, a similar picture arises except the case that the FAS of medium and large sized are not statistically different from each other. The positive relationship between the firm size and FAS contrasts with the presence of an economies of scale in liquidity postulation of the trade-off theory. The evidence may not be supporting also the pecking-order theory based explanation that larger firms tend to hold less FA as they are less likely to suffer from an information asymmetry induced financial constraint. However, as already discussed, the postulations about the firm size and FAS relationship may become blurry under the pecking-order theory postulation that firms have no optimal liquidity ratio target which is invariant to their internal cash flows and profitability. Accordingly, higher profitability and cash flows allow the firms preferring internal finance to increase their liquid asset holdings as a financial buffer. In this context, the evidence suggesting that the large sized firms with higher profitability hold more FA may indeed be interpreted as lending a support to the pecking-order theory which controls for profitability[12].

The positive relationship between the firm size and FAS may be argued to need a further explanation beyond the conventional view that firms hold FA *only* for transactions and precautionary motives under information asymmetries induced financial constraints. Alternatively, FA may be viewed not only as a financial buffer against liquidity shocks but also as a portfolio choice substituting real investments due to their higher real rate of return under macroeconomic uncertainty. The large sized firms have higher ability to allocate their resources into financial and real investments as they are less financially constrained. The preliminary evidence from the Turkish corporate sector data is consistent with such a speculative-cum-precautionary motive. This speculative motive appears to be

[11] Note that, in Turkey, considerably large part of the corporate sector debt (around 25%) is in the form of trade credits which does not directly rely on collateral (Yalçın *et al.*, 2005 and Aydın *et al.* 2006). Yalçın *et al.* (2005) find that the share of trade credits increases with the manufacturing industry firm size. This is consistent with the view that trade credit becomes an important complement to bank credits especially for the collaterally poor firms with credit constraints (Aydın *et al.*, 2006). Consequently, the collateral ratios may better be related to bank credits rather than the leverage ratio *per se*.

[12] This may be consistent with the fact that non-financial firms in the G-7 countries have preferred to use their substantially increased profits to acquire FA or to repay debt, rather than to finance new capital investments since the early 2000s (IMF, 2006).

rather limited for the smaller firms as they are relatively less flexible for holding FA for interest income apart from their liquidity under their heavier financial constraints. Consistent with their speculative-led motive, the ratio of interest income to operating profits[13] (INTINC) tends to be increasing with firm size both for manufacturing and ONF firms. During the period, their heavier investment on FA yielded especially large sized manufacturing and ONF firms to obtain substantial interest income constituting about 18% and 25% of their operating profits, respectively.

IV. The Determinants of the Financial Asset and Government Securities Holdings of the Corporate Sector

This section proceeds with the empirical investigation of the determinants of the non-financial firms' holdings of FA in Turkey during the 1990-2004 period using annual firm-level data compiled by the CBRT. To this end, we consider the following equation:

$$FAS_{it} = \alpha_1 FAS_{it-1} + \beta F_{it} + \gamma M_t + u_i + \upsilon_t + \eta_{it} \quad (1)$$

where FAS is the ratio of FA to total assets (TA), F and M contain firm-specific and macroeconomic variables, respectively, with β and γ being the vectors of corresponding regression coefficients. In (1), υ_t and u_i are respectively time (t) and cross-section (i) specific effects and η_{it} is a disturbance term. The set of the firm-specific variables (F) postulated to explain FAS contains profitability ratio as measured by return on assets (PROF), leverage ratio (LR, debt over total assets), asset tangibility as a proxy for the collateral (COL, the ratio of net tangible fixed assets to total assets), and firm size (SIZE, represented by the log of total sales deflated by the consumer price index)[14]. For the macroeconomic variables, we consider the Real Sector Confidence Index of the CBRT based on business tendency surveys to proxy for decrease in perceived macroeconomic uncertainty (CONF) and the real interest rates on government securities (RG) as a measure of the own rate of return on FA. To test whether the coefficient estimates do not vary across different firm groups, we also estimate (1) augmented with dummy variables

[13] It may be preferable to consider alternative measures such as net profits or profits before taxes. However, for some observations these alternative measures have substantially high negative values precluding a meaningful interpretation of the ratios based on them.

[14] In the preliminary analyses, we considered also the firms' debt maturity (long-term debt over total debt) to explain FA. Potentially due to the fact that the bulk of the corporate sector debt have been short-term without a significant variation over time (Table 1 and Aydın *et al.,* 2006) the maturity variable was found to be insignificant in all the regressions.

($TYPE_j$) defining the firm size category where dummy variables are interacted with all explanatory variables:

$$FAS_{it} = \alpha_1 FAS_{it-1} + \beta F_{it} + \gamma M_t + \alpha_{1j}(TYPE_j * FA_{it-1}) + \beta_j(TYPE_j * F_{it}) + \gamma_j(TYPE_j * M_t) + u_i + \upsilon_t + \eta_{it} \quad (2)$$

In (2) α_1, β and γ now give the coefficients for the base category defined by the excluded dummy variable whilst α_{1j}, β_j and γ_j give the corresponding differences in the coefficients from the base for the category defined by $TYPE_j$.

Until very recently, the bulk of the empirical literature specified static panel data models for the FA holdings and employed the standard fixed/random effects procedures for estimation. The static models, often implicitly, maintain that FA holdings contemporaneously adjust to changes in their fundamental determinants under perfect information with no adjustment cost and the consequent lack of financial adaptation leading to hysteresis/persistence. Following the recent literature including Özkan and Özkan (2004) and Baum *et al.* (2006), we specify (1) as to contain also the lagged FAS_{it} which is consistent with a partial adjustment mechanism (PAM). The PAM may be justified under the conventional arguments including the existence of adaptive expectations and transactions and adjustment costs. This is consistent also with a target adjustment model (Opler *et al*., 1999) maintaining that firms adjust their asset holdings to their target/desired levels. In the same vein, the coefficient of FAS_{it-1} (α_1) can be interpreted as to give the adjustment coefficient ($\lambda = 1 - \alpha_1$) implying the ability of firms to adjust to their desired/target levels (Özkan and Özkan, 2004). The use of the conventional static panel data estimation procedures for the dynamic equation such as (1), however, may be misleading as surveyed by Arellano and Honore (2001) and Bond (2002).

It may be plausibly argued that the firm specific variables are potentially endogenous for the evolution of the FA holdings. In this paper, we address the simultaneity issue along with the inclusion of the FAS_{it-1} by estimating the equation by employing Generalised Method of Moments (GMM) procedures developed for dynamic panel data models (DPD) by Arellano and Bond (1991) and Arellano and Bover (1995). We maintain that the macroeconomic variables CONF and RG and their interactions with dummy variables are strictly exogenous for the evolution of the firms' FA holdings over time. All the firm specific variables (PROF, LR, COL, SIZE) and their interactions with dummy variables, on the other hand, are treated as being potentially endogenous.

IV.1. The Determinants of the Financial Asset Holdings

IV.1.1. All Non-Financial Firms

We first proceed with the empirical investigation of the determinants of the financial asset holdings of the non-financial firms in Turkey. Table 2 reports the results of the one-step system GMM estimations[15] (Arellano and Bover, 1995 and Blundell and Bond, 1998) for the samples of manufacturing industry and other non-financial (ONF) firms using all the available t-2 (and earlier) dynamic lags of FAS_{it}, $PROF_{it}$, LR_{it}, COL_{it},, and $SIZE_{it}$ as instruments. As noted by Bond (2002), the maintained endogenous variables should be treated symmetrically with the dependent variable, therefore we specify exactly the same dynamic lag structure for the instruments for FAS_{it} and the firm specific variables. The instrument set contains also the current values of the maintained strictly exogenous variables CONF and RG. The equations in Table 2 pass all the diagnostics except the Hansen-Sargan J-test of overidentification restrictions[16]. The consistency of the GMM estimators and the validity of instruments crucially depend on the absence of higher-order serial correlation in the idiosyncratic component of the error term. If the disturbance in the original dynamic levels equation is not serially correlated, there should be evidence of significant negative AR(1) and no significant AR(2) in the difference equation (Arellano and Bond, 1991). The results for m1 and m2 for the equations therefore suggest the lack of serial correlation in the transformed GMM models. Equation (2.1) in Table 2 reports the results for the whole sample of firms. The results for the manufacturing industry and ONF firms are reported by equations (2.2) and (2.3), respectively. We also estimated (2) for the whole sample defining the generic $TYPE_j$ as a dummy variable taking unity for the ONF firms. In this equation, the interactions of the firm specific and macroeconomic variables with $TYPE_j$ are treated as endogenous and exogenous, respectively, and

[15] All estimates are performed using Stata 8.2, command xtabond2 by Rodman (2005).

[16] The results for the Hansen-Sargan tests may be interpreted with a caution as their size and power properties for the DPD models using the GMM are yet to be adequately established. Arellano and Bond (1991) mention that the Sargan test on the one-step estimation often over rejects the validity of the overidentification restrictions. In the same vein, Hoxby and Paserman (1998) show that even a small intra-group correlation may lead to the rejection of the null too often for the standard overidentification tests. According to Bowsher (2002) the Hansen-Sargan test tends to under-reject the null as the number of the moment conditions increases for a given N. The notable improvements in the Hansen-Sargan test results for the subsample estimations presented in the following sections may be consistent with an argument that the properties of the test may not be invariant to the number of moment conditions relative to the sample size and the number of groups.

therefore the instrument set is defined accordingly. In equation (2.2), t_{MAN} is the t-ratio of the corresponding variable interacted with the dummy variable for the ONF firms and thus tests whether the coefficients are not significantly different between manufacturing industry and the ONF firms.

According to (2.1), all the variables except the leverage ratio (LR) are significant in explaining the corporate sector FA holdings in Turkey during the period. The statistical insignificance of the LR coefficient does not change even when we consider the manufacturing industry and ONF samples separately as reported by (2.2) and (2.3). As already discussed, the insignificance of the LR may not be surprising as the sign of it is not unambiguous. Higher debt levels may indicate better access to financial markets and thus lower precautionary demand for liquidity. Furthermore, the cost of funds to invest in liquidity increases with debt level and thus a negative relationship between LR and FAS may be expected. Higher debt levels, on the other hand, can increase the likelihood of financial distress and thus the precautionary demand for liquidity. As will be further investigated later in this paper, these offsetting effects of LR on FAS leading to the insignificant LR coefficient may change with different firm groupings.

The FA holdings appear to be relatively persistent as suggested by the significant FAS_{it-1} coefficient in (2.1). The estimated FAS_{it-1} coefficients do not vary significantly between the manufacturing industry firms and other non-financial firms as reported by (2.2) and (2.3). The value of the adjustment coefficient ($\lambda = 1- \alpha_1$) can be interpreted as high (around 0.70) suggesting that the costs of deviating from the desired FA holdings are significant. The inertia in the FA holdings is consistent also with the presence of financial adaptation as financial contracts involve learning costs implying some stickiness in user preferences (Dornbusch *et al.*, 1990). The evidence suggesting that the adjustment is rapid, however, may be interpreted as reflecting the higher cost of being out of equilibrium relative to the cost of adjustment.

Consistent with the preliminary evidence presented by Table 1 earlier, the FAS significantly increase with the firm size. The size affect appears to be higher for manufacturing firms than the ONF firms. The positive relationship between the FAS and the firm size contrasts with the trade-off theory postulating that there is an economies of scale in liquidity (Opler *et al.*, 1999). In the absence of a precautionary-cum-speculative motive, the FAS may be postulated to decrease with the firm size as larger firms may be less financially constrained as suggested by the conventional pecking-order theory. The

evidence, however, supports the view that neither the pure transactions motive of the trade-off theory nor the conventional transactions-cum-precautionary motive of the pecking-order theory is solely adequate to explain the corporate sector FA holdings in the presence of a speculative motive. When the firms are viewed to be able to substitute their investments into financial and real investments, then the empirical evidence may become much less puzzling.

Table 2. The Determinants of Financial Asset Holdings: All Firms

	(2.1) All Firms	(2.2) Man. Ind. Firms	(2.3) ONF Firms
FAS_{it-1}	0.314*** (0.0148)	0.303*** (0.0169)	0.324*** (0.0216) $t_{MAN} = 0.91$
$PROF_{it}$	0.020* (0.0130)	0.019* (0.0118)	0.015 (0.0185) $t_{MAN} = 0.46$
LR_{it}	0.001 (0.0069)	-0.009 (0.0071)	0.005 (0.0188) $t_{MAN} = 0.59$
COL_{it}	-0.088*** (0.0130)	-0.114*** (0.0155)	-0.089*** (0.0188) $t_{MAN} = 0.47$
$SIZE_{it}$	0.812*** (0.1294)	1.073*** (0.1520)	0.858*** (0.2128 $t_{MAN} = -4.22$***
$CONF_t$	-0.047*** (0.0060)	-0.056*** (0.0072)	-0.040*** (0.0093) $t_{MAN} = 3.60$***
INT_t	0.035*** (0.0057)	0.021*** (0.0068)	0.049*** (0.0090 $t_{MAN} = 4.66$***
Constant	5.885 (0.9001)	6.001*** (1.0773)	4.836*** (1.3234 $t_{MAN} = 2.83$***
N	51857	25350	26507
No. of firms	14819	6287	8532
Diagnostics	$\chi^2_W(7) = 768[0.00]$ P[H-S] = 0.00 m1 = -24.2 [0.00] m2 = -1.58 [0.12]	$\chi^2_W(7) = 545[0.00]$ P[H-S] = 0.00 m1 = -18.8 [0.00] m2 = 0.00 [1.00]	$X^2_W(7) = 523$ [0.00] P[H-S] = 0.01 m1 = -16.6 [0.00] m2 = 1.25 [0.21]

Notes: N is the effective number of firm-year observations. The values in parentheses are the coefficient standard errors (d.f. adjusted) that are robust to within cross-section residual correlation and heteroscedasticity (Arellano, 1987). *, ** and *** denote the significance at the 10, 5 and 1 %, respectively. m1 and m2 are the Arellano and Bond (1991) tests for first-order and second-order serial correlation, asymptotically N(0,1). χ^2_W is the Wald test for the joint insignificance of the explanatory variables, with p-values given in [.]. P[H-S] reports the p–value of the Hansen-Sargan test for instrument validity and overidentification restrictions. t_{MAN} is the t-ratio to test the hypothesis that the coefficient of the corresponding variable is the same for manufacturing industry and ONF firms.

The effect of profitability (PROF) on FAS is positive and significant at the 10% level for the manufacturing industry firms. The profitability coefficient is positive but statistically insignificant for the other non-financial firms. The positive coefficient of PROF is consistent with the pecking-order theory suggesting that the firms with higher profitability hold more liquid FA as a financial buffer since they prefer internal over external finance. This is also helpful in explaining the positive relationship between FAS and SIZE as larger firms are also those with higher profitability. To the extent that profitability is also a proxy for firms' growth opportunities, the positive PROF coefficient may imply an uncertainty induced precautionary demand for FA to avoid them to miss to valuable investment opportunities in some states of nature under credit market imperfections. Furthermore, the larger firms with higher access to external financing may take advantageous credit market conditions to accumulate financial assets to be used as a buffer when external capital is more expensive (Greenwood, 2005 and IMF, 2006).

We expect a negative relationship between collateral (COL) and FAS as asset tangibility can mitigate contractibility problem and thus relax the financial constraint leading firms' transactions-cum-precautionary demand for liquidity to decrease (Almeida and Campello, 2006 and IMF, 2006). The negative and significant COL coefficients in all the equations in Table 2 are in line with this expectation. The impact of asset tangibility is significantly more for manufacturing industry firms than the other non-financial firms.

For both manufacturing and ONF firms an increase in the perceived confidence in macroeconomic conditions (CONF) lead to a significant decrease in the FAS. As an increase in the confidence imply a decrease in the macroeconomic uncertainty that the firms may face with, the negative CONF coefficient may indeed be interpreted as to proxy the impact of uncertainty on the FA holdings due to the precautionary motive. The decrease in the precautionary FA holdings with a decrease in macroeconomic uncertainty (an increase in macroeconomic confidence) also provides further support to the importance of macroeconomic stability in stimulating the efficient allocation of resources.

The literature often ignores the role of own rate of return on FA which may be justified under a transactions-cum- precautionary demand for liquid assets with no significant positive real return argument. As already discussed in Section II, FA may be viewed not only as a financial buffer against liquidity shocks but also as a portfolio choice substituting real investments due to their higher real rate of return under macroeconomic uncertainty. In such a case, the own real return of FA may become a crucial variable to

explain the demand for them. Under the severely high inflation rates sustained during most of the sample until very recently, the holdings of the fiat cash were almost negligible and the presence of very short maturities allowed firms to hold interest bearing FA including government securities. It may, thus, be plausible to consider the real interest rates on government securities (RG) as a proxy measure of the own rate of return on FA. The results presented by Table 2 strongly support the hypothesis that the demand for FA significantly increases with RG. The impact of the RG is significantly higher for the ONF firms than the manufacturing firms suggesting that the speculative-led motive may be more important for the former.

The significant and positive impact of RG on FAS lends a support to the view that the FAS of firms may not be solely explained by the conventional transactions and precautionary motives. When the speculative motive is also taken into account, our findings suggesting that the FAS increase with the firm size may become much less puzzling. The ability of firms to allocate their resources into real and financial investments can be expected to increase with their size as larger firms have better access to financial markets and thus less financially constrained. Consequently, consistent with our findings, the speculative demand for FA tends to increase with the firm size.

The literature often does not differentiate manufacturing industry and ONF firms in investigating their liquid FA holdings. The results presented by Table 2, however, strongly suggest that the impacts of some firm specific variables including profitability, leverage ratio and collateral and macroeconomic variables like government bond real interest rates may significantly vary between manufacturing industry and ONF firms. Following the bulk of the literature, we considered the (log) real assets of the firms as a proxy variable for their size in estimating the equations in Table 2. This allowed us to investigate (and control for) the impact of the size but provided no information to test whether the effects of the firm specific and macroeconomic variables vary with respect to the firms' size classification as small, medium and large[17]. In the following two sections, we proceed with the investigation of this issue for the manufacturing industry and ONF firms, respectively[18].

[17] See Section III for the classification of the firms as small, medium and large.

[18] An alternative choice might be interacting the variables with the SIZE proxy. Our preferred approach, however, allows us to test whether the effects of the variables do not change across small, medium and large sized firms.

IV.1.2. Manufacturing Industry Firms

In this section, we consider manufacturing firms and investigate whether the results are robust for the small, medium and large sized firms. Table 3 reports the results of the one-step system GMM estimations using all the available t-2 (and earlier) dynamic lags of the firm-specific variables. The instrument set contains also the current values of the maintained strictly exogenous variables CONF and RG. Equations (3.2), (3.3) and (3.4) reports the results for the subsamples of large, medium and small sized manufacturing industry firms, respectively. Equation (3.5) reports the results for the estimation of (2) for the whole sample. In (3.5) all the variables including the instrument set are interacted with $Type_1$ and $Type_2$, which define the dummy variables for the small and medium sized firms, respectively. The equations in Table 3 pass all the diagnostics except the Hansen-Sargan J-test of overidentification restrictions. The combined equation estimated for the whole sample, which is indeed our main equation of interest, passes also the Hansen-Sargan test supporting our choice of the instrument set.

The results strongly suggest that the determinants of FAS significantly differ across large, medium and small sized manufacturing industry firms. Small sized firms adjust more rapidly than the medium and large sized firms as suggested by the lower FAS_{it-1} coefficient. Small sized firms may be expected to be more financially constrained leading them to face up with relatively higher cost of deviating from their desired FA holdings. The larger firms, on the other hand, have better access to credit markets allowing them to adjust more slowly without incurring a high level of agency cost. The significantly higher adjustment coefficient for the small firms, in this context, may be reflecting their situation that the cost of being out of equilibrium relative to the cost of adjustment is higher. Consistent with the argument that larger firms are more flexible in allocating their resources into real and financial investments, the impact of the profitability appears to be monotonically increasing with the firm size. The small sized firms are much more dependent on external finance and consequently they may be expected to have less desire to hold financial assets due to the precautionary motive. The behaviour of the small sized firms with their more rapid adjustment towards their target desired cash holdings and less desire to accumulate financial assets with an increase in their profits appears to be consistent with the postulations of the trade-off theory. In the context of the significance

of the PROF coefficient, it may be argued that the medium and large sized manufacturing firms behave in accordance with the pecking-order theory.

The LR coefficient is significant only for the small sized manufacturing firms. The negative LR coefficient may reflect that the increase in the cost of liquidity with higher debt levels is the more dominant factor for the small sized firms. This result, however, should be interpreted with a caution since the differences in the LR coefficient estimates across the firm groups are not statistically significant. The cost of external finance decreases with asset tangibility and thus the transactions and precautionary demand for FA decreases with the collateral (COL). The figures presented by Table 1 suggested that the collateral ratios monotonically increase with the size of the manufacturing firms. The impact of the collateral on reducing the FAS, on the other hand, significantly increases with firm size. This is consistent with the view that tangible fixed assets of the larger firms worth more as a collateral and can mitigate contractibility problem better so that their marginal benefit in reducing the precautionary demand for liquidity is higher.

The effect of macroeconomic uncertainty on precautionary FA holdings may be expected to be substantially higher for financially constrained firms (Baum *et al*., 2006). As Almeida *et al.* (2004) indicate, financially unconstrained firms have no reason to hold precautionary liquidity. Consistent with these arguments, the FA holdings of the small and medium sized manufacturing firms significantly increase with an increase in the macroeconomic uncertainty (a decrease in the macroeconomic confidence, CONF). The impact of uncertainty on the large sized firms appears to be insignificant. Regardless of their size classification, all firm types tend to increase their FAS significantly as the real rate of return on government bonds (RG) increases. The impact of RG on FAS is statistically the same for the small, medium and large sized manufacturing firms.

Table 3. The Determinants of Financial Asset Holdings: Manufacturing Industry Firms

	Subsamples Estimates				**(3.5) Combined Equation**		
	(3.1) Whole Sample	**(3.2) Large**	**(3.3) Medium**	**(3.4) Small**		**$Type_1$ = Small**	**$Type_2$ = Medium**
FAS_{it-1}	0.303*** (0.0169)	0.370*** (0.0324)	0.359*** (0.0336)	0.254*** (0.0235)	0.370*** (0.0324)	-0.115*** (0.0400)	-0.011 (0.0467)
$PROF_{it}$	0.019* (0.0118)	0.061*** (0.0219)	0.020** (0.0106)	0.020 (0.0216)	0.061*** (0.0219)	-0.041 (0.0308)	-0.041* (0.0244)
LR_{it}	-0.009 (0.0071)	-0.009 (0.0121)	-0.001 (0.0056)	-0.031** (0.0146)	-0.009 (0.0121)	-0.022 (0.0190)	-0.008 (0.0133)
COL_{it}	-0.114*** (0.0155)	-0.184*** (0.0334)	-0.096*** (0.0258)	-0.065*** (0.0198)	-0.184*** (0.0334)	0.118*** (0.0388)	0.087** (0.0421)
$CONF_t$	-0.056*** (0.0072)	-0.005 (0.0200)	-0.051*** (0.0107)	-0.036*** (0.0093)	-0.005 (0.0200)	-0.031 (0.0220)	-0.045** (0.0227)
RG_t	0.021*** (0.0068)	0.045*** (0.0122)	0.034*** (0.0083)	0.067*** (0.0081)	0.045*** (0.0122)	0.022 (0.0147)	-0.013 (0.0151)
$SIZE_{it}$	1.073*** (0.1520)						
Constant	6.001*** (1.0773)	10.704*** (2.2709)	11.375*** (1.2792)	10.554*** (1.6023)	10.704*** (2.2709)	-0.150 (2.7793)	0.671 (2.6064)
N	25350	3014	7910	14426	25350		
No. of firms	6287	385	1521	4381	6287		
Diagnostics	$\chi^2_W(7) = 545[0.00]$ P[H-S] = 0.00 m1 = -18.8 [0.00] m2 = 0.00 [1.00]	$\chi^2_W(6) = 242[0.00]$ P[H-S] = 0.97 m1 = -8.38 [0.00] m2 = -1.30 [0.19]	$\chi^2_W(6) = 161[0.00]$ P[H-S] = 0.01 m1 = -10.7 [0.00] m2 = -0.24 [0.81]	$\chi^2_W(6) = 212[0.00]$ P[H-S] = 0.08 m1 = -12.6 [0.00] m2 = 1.60 [0.11]	$X^2_W(20) = 643$ [0.00] P[H-S] = 0.11 m1 = -18.3 [0.00] m2 = 0.21 [0.83]		

Notes: N is the effective number of firm-year observations. The values in parentheses are the coefficient standard errors (d.f adjusted) that are robust to within cross-section residual correlation and heteroscedasticity (Arellano, 1987). *, ** and *** denote the significance at the 10, 5 and 1 %, respectively. m1 and m2 are the Arellano and Bond (1991) tests for first-order and second-order serial correlation, asymptotically N(0,1). χ^2_W is the Wald test for the joint insignificance of the explanatory variables, with p-values given in [.]. P[H-S] reports the p–value of the Hansen-Sargan test for instrument validity and overidentification restrictions. In (3.5) the columns under $Type_1$ and $Type_2$ reports the coefficient estimates of the corresponding variables interacted with dummy variables defining small and medium sized manufacturing industry firms, respectively.

IV.1.3. Other Non-Financial Firms

Table 4 reports the one-step robust system GMM results for the subsamples and the whole sample of the ONF firms estimated by using the same instrument selection procedure as in the earlier sections. The estimation results for the whole sample presented by (4.5) are data-acceptable as the equation passes all the diagnostics including the instrument set validity and the lack of serial correlation. When compared with those for the manufacturing firms, the persistence of FAS is relatively higher for the ONF firms. The adjustment coefficients tend to decrease with the firm size but the differences between them are not significant as reported by (4.5). Consistent with the results for the manufacturing industry firms, the impact of profitability is the highest for the large sized ONF firms. However, differing from the manufacturing firms, the PROF coefficient is significant (insignificant) for the small (medium) sized ONF firms. A similar finding is reported for the LR coefficient. The impact of the LR is significant only for the medium sized ONF firms. The positive coefficient may be implying that medium sized ONF firms tend to hold more precautionary FA as higher debt levels can increase the likelihood of a financial distress for them. The positive financial distress effect of the LR tends to be offset by negative debt risk premium and better ability to access to financial markets affects for the small and large sized ONF firms, respectively. The significant PROF coefficient for the small sized ONF firms, in this context, may be interpreted as they preferring internal finance due to the higher cost of risk premium on external finance accumulation for them.

According to the figures presented by Table 1 earlier, the collateral ratios increase with the size of the ONF firms. The results by Table 4 suggest that higher asset tangibility (COL) leads to lower precautionary FA holdings and the impact is statistically the same for the small, medium and large sized firms. Contrasting with the evidence for the manufacturing firms, the marginal benefit of the collateral tends to decrease with the ONF firm size. An increase in the macroeconomic uncertainty (a decrease in the macroeconomic confidence CONF) causes ONF firms to hold more precautionary financial assets as expected. However, the evidence does not support the view that the impact of macroeconomic uncertainty decreases with the firm size. This may be either due to a case that all the ONF firms, regardless of their size, are equivalently financially constrained or the larger firms with more tangible fixed assets are more prudent in

response to a macroeconomic uncertainty. The response of FAS to government bond interest rates is significantly positive for medium and small sized firms. The positive but insignificant RG coefficient for the large sized ONF firms as these firms have the highest share of government securities in their total assets and obtaining the highest interest income constituting around a quarter per cent of their operating income (Table 1). Given the fact that government securities real interest rates have been substantially high during the period, the insignificance of the RG coefficient for the large firms may be explained by their financial adaptation. As government securities have yielded relatively less risky real returns whilst providing liquidity during the period, especially large sized ONF firms may well be allocating a certain proportion of their excess cash flows into FA including GS. To investigate the validity of such a financial adaptation argument, we clearly need to investigate also the determinants of the firms' holdings of government securities during the period. This is indeed the task of the following section in which we undertake for the samples of both manufacturing industry and other non-financial firms.

IV.2. The Determinants of the Government Securities Holdings

Non-financial firms hold FA including government securities to hedge themselves against liquidity and interest rate risks and maturity mismatches. Government securities (GS), especially those with short maturities, provide liquidity services and can be used as financial collateral. In this context, the firms' holdings of short-term government debt instruments can plausibly be explained by the transactions-cum-precautionary motives of the conventional literature. However, under macroeconomic instability with substantially high budget deficits and thus high uncertainty leading to excessively high real interest rates for GS, non-financial firms may prefer to defer real investments and hold GS also for their speculative motive. In this context, government domestic debt finance can alleviate or relax the firms' financial constraints by draining the available resources in the economy or by providing liquidity services, respectively. This section investigates the determinants of the firms' holdings of GS under such macroeconomic conditions. The consequences of the government debt finance and the non-financial firms' GS holdings for their investment decisions are investigated in the following section.

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Table 4. The Determinants of Financial Asset Holdings: Other Non-financial Firms

	Subsamples Estimates				**(4.5) Combined Equation**		
	(4.1) Whole Sample	**(4.2) Large**	**(4.3) Medium**	**(4.4) Small**		**Type = Small**	**Type = Medium**
FAS_{it-1}	0.324*** (0.0216)	0.403*** (0.0685)	0.390** (0.0396)	0.307*** (0.0264)	0.403*** (0.0685)	-0.097 (0.0734)	-0.013 (0.0791)
$PROF_{it}$	0.015 (0.0185)	0.131*** (0.0462)	0.033 (0.0275)	0.040** (0.0214)	0.131*** (0.0462)	-0.092* (0.0510)	-0.099* (0.0538)
LR_{it}	0.005 (0.0188)	0.004 (0.0251)	0.013*** (0.0053)	-0.004 (0.0081)	0.004 (0.0251)	-0.008 (0.0264)	-0.009 (0.0257)
COL_{it}	-0.089*** (0.0188)	-0.049 (0.0352)	-0.095*** (0.0392)	-0.100*** (0.0195)	-0.049 (0.0352)	-0.050 (0.0402)	-0.046 (0.0527)
$CONF_{t}$	-0.040*** (0.0093)	-0.052*** (0.0220)	-0.053*** (0.0174)	-0.017* (0.0107)	-0.052*** (0.0220)	0.036 (0.0245)	-0.001 (0.0281)
RG_{t}	0.049*** (0.0090	0.007 (0.0184)	0.050*** (0.0124)	0.096*** (0.0108)	0.007 (0.0184)	0.090*** (0.0213)	0.043** (0.0221)
$SIZE_{it}$	0.858*** (0.2128						
Constant	4.836*** (1.3234	10.462*** (3.1377)	10.376*** (2.0517)	7.615*** (1.2910)	10.462*** (3.1377)	-2.847 (3.3929)	-0.085 (3.7489)
N	26507	2176	5546	18785	26507		
No. of firms	8532	398	1443	6691	8532		
Diagnostics	$X^2_W(7) = 523.00]$ P[H-S] = 0.01 m1 = -16.6 [0.00] m2 = 1.25 [0.21]	$\chi^2_W(6) = 51.6[0.00]$ P[H-S] = 0.99 m1 = -5.84 [0.00] m2 = 1.30 [0.19]	$\chi^2_W(6) = 69.6[0.00]$ P[H-S] = 0.02 m1 = -8.66 [0.00] m = 2.70 [0.01]	$\chi^2_W(6) = 222[0.00]$ P[H-S] = 0.04 m1 = -13.1 [0.00] m2 = -0.40 [0.69]	$\chi^2_W(21) = 430$ [0.00] P[H-S] = 0.17 m1 = -16.7 [0.00] m2 = -1.37 [0.21]		

Notes: N is the effective number of firm-year observations. The values in parentheses are the coefficient standard errors (d.f adjusted) that are robust to within cross-section residual correlation and heteroscedasticity (Arellano, 1987). *, ** and *** denote the significance at the 10, 5 and 1 %, respectively. m1 and m2 are the Arellano and Bond (1991) tests for first-order and second-order serial correlation, asymptotically N(0,1). χ^2_W is the Wald test for the joint insignificance of the explanatory variables, with p-values given in [.]. P[H-S] reports the p–value of the Hansen-Sargan test for instrument validity and overidentification restrictions. In (3.5) the columns under $Type_1$ and $Type_2$ reports the coefficient estimates of the corresponding variables interacted with dummy variables defining small and medium sized ONF firms, respectively.

The empirical literature often does not explicitly take into account the role of government debt instruments in the firms' FA portfolios. We maintain that the sets of the firm specific (F) and macroeconomic condition variables defined for the determinants of the FA holdings may be postulated also for explaining the non-financial firms holdings of government securities. Therefore, we consider the following general forms:

$$GSS_{it} = \alpha_1 GSS_{it-1} + \beta F_{it} + \gamma M_t + u_i + \upsilon_t + \eta_{it} \quad (3)$$

$$GSS_{it} = \alpha_1 GSS_{it-1} + \beta F_{it} + \gamma M_t + \alpha_{1j}(TYPE_j * FA_{it-1}) + \beta_j(TYPE_j * F_{it}) + \gamma_j(TYPE_j * M_t) + u_i + \upsilon_t + \eta_{it} \quad (4)$$

where GSS is the share of government securities in total assets. The sets of the firm-specific (F) and macroeconomic condition variables (M) are maintained to be the same as the FA holdings and $TYPE_j$ is a dummy variable defining the firm size category as in the earlier sections.

Table 5 reports the robust one-step system GMM estimation results for the samples of manufacturing industry and ONF firms using all the available t-2 (and earlier) dynamic lags of GSS_{it}, $PROF_{it}$, LR_{it}, COL_{it},, and $SIZE_{it}$ as instruments. The instrument set contains also the current values of the maintained strictly exogenous variables CONF and RG. In (4.5) all the variables including the instrument set are interacted with the size dummies $Type_1$ and $Type_2$, which define the dummy variables for the small and medium sized firms, respectively. The equations in Table 5 pass all the diagnostics except the Hansen-Sargan test. The results for the whole sample suggest that, consistent with their FA holding behaviour, the non-financial firms' holdings of GS increase with their profitability and size and decreases with their asset tangibility. The LR is significantly positive implying that the ability of firms with higher debt to access financial markets more than offsets the negative impacts of higher debt. Supporting the presence of a financial adaptation, the GSS exhibit some persistence as suggested by the significant GSS_{it-1} coefficient in (5.1). The persistence, however, is not large and non-financial firms can be viewed to adjust relatively rapidly to a deviation from their desired GS holdings. Non-financial firms increase their GSS with an increase in the macroeconomic uncertainty and real interest rates on government securities. All these findings are broadly consistent with those for the FA holdings of the firms discussed in Section IV.1.1. This may not be surprising as FAS and GSS followed a similar path during the period as shown by Figure 1 earlier.

Table 5. The Determinants of the Government Securities Holdings：All Firms			
	(5.1) All Firms	**(5.2) Man. Ind. Firms**	**(5.3) ONF Firms**
$\mathbf{GSS_{it-1}}$	0.317*** (0.0302)	0.274*** (0.0299)	0.347*** (0.0497) t_{MAN} = 3.23***
$\mathbf{PROF_{it}}$	0.025*** (0.0067)	0.026*** (0.0064)	0.022*** (0.0093) t_{MAN} = -2.52***
$\mathbf{LR_{it}}$	0.005** (0.0022)	0.009** (0.0032)	0.003 (0.0028) t_{MAN} = -3.65***
$\mathbf{COL_{it}}$	-0.017** (0.0072)	-0.043*** (0.0096)	-0.014 (0.0095) t_{MAN} = -1.41
$\mathbf{SIZE_{it}}$	0.504*** (0.0810)	0.619*** (0.0991)	0.449*** (0.1420) t_{MAN} = -0.94
$\mathbf{CONF_t}$	-0.009*** (0.0028)	-0.006 (0.0036)	-0.013*** (0.0043) t_{MAN} = -0.20
$\mathbf{RG_t}$	0.011*** (0.0035)	0.006 (0.0045)	0.017*** (0.0059) t_{MAN} = 2.20**
constant	-1.612*** (0.0427)	-2.297*** (0.5594)	-1.0007 (0.6432) t_{MAN} = 2.20**
N	51857	25350	26507
No. of firms	14819	6287	8532
Diagnostics	$\chi^2_W(7)$ = 570 [0.00] P[H-S] = 0.00 m1 = -14.2 [0.00] m2 = 0.32 [0.75]	$\chi^2_W(7)$ = 345.00] P[H-S] = 0.00 m1 = -11.6 [0.00] m2 = 0.89 [0.38]	$\chi^2_W(7)$ = 258 [0.00] P[H-S] = 0.01 m1 = -8.69 [0.00] m2 = -0.51 [0.61]

Notes: N is the effective number of firm-year observations. The values in parentheses are the coefficient standard errors (d.f adjusted) that are robust to within cross-section residual correlation and heteroscedasticity (Arellano, 1987). *, ** and *** denote the significance at the 10, 5 and 1 %, respectively. m1 and m2 are the Arellano and Bond (1991) tests for first-order and second-order serial correlation, asymptotically N(0,1). χ^2_W is the Wald test for the joint insignificance of the explanatory variables, with p-values given in [.]. P[H-S] reports the p–value of the Hansen-Sargan test for instrument validity and overidentification restrictions. t_{MAN} is the t-ratio to test the hypothesis that the coefficient of the corresponding variable is the same for manufacturing industry and ONF firms.

As for the FAS, the determinants of the GSS of the manufacturing industry and ONF firms differ from each other to a certain extend. The persistence of the GSS tends to be significantly higher for the ONF firms reflecting a plausible situation that manufacturing firms are able to adjust more rapidly to disequilibrium. The non-financial firms' GSS increase with their profitability and size and the magnitude of these affects appears not to be statistically different between manufacturing and ONF firms. The

impacts of the debt related variables LR and COL are significant only for manufacturing firms. Higher asset tangibility is thus effective for these firms in reducing a need to hold GS as a liquid collateral. In the same vein, the manufacturing firms with higher debt levels appear to be able to hold more GS potentially reflecting their better access to credit markets. This may be consistent also with a situation that manufacturing firms with lower debt risk premiums and better access to financial markets may prefer to borrow from international markets in the case of favourable conditions and invest in high yielding domestic GS. An increase in macroeconomic uncertainty and government bond real interest rates appear to be effective in increasing their GS holdings only for the ONF firms. Although the behaviour may change with respect to the firm size as will be discussed later, this preliminary evidence may suggest that the speculative motive is stronger for the ONF firms. This is consistent also with the observation that the GSS of the ONF firms are significantly larger than those of the manufacturing firms as already presented by Table 1.

Table 6 reports the system GMM results for the subsamples and the whole sample of the manufacturing industry firms. As for the FAS, the GS holdings of the firms exhibits some inertia reflecting financial adaptation whilst small sized firms adjust to their desired holdings more rapidly than the others. In response to an increase in their profits, large and small sized firms tend to accumulate more government securities compared to the medium sized firms. This may reflect that small sized firms are more prudent against interest rate and credit risks and the large sized firms are less financially constrained so that they are more able to make speculative motive-led financial investments. The LR coefficient is significant only for the small sized firms potentially due to their higher need to use GS to hedge against interest rate and credit shocks. However, the differences between the LR coefficients across the small, medium and large sized firms are not statistically significant. Firms with higher asset tangibility may be expected to hold less GS to be used as collateral. As the asset tangibility increases with the manufacturing industry firm size (Table 1), the significant decrease in the impact of COL with the firm size may thus be interpreted as perfectly in line with this expectation.

The precautionary demand for FA increases with macroeconomic uncertainty. This may not be the case for speculative demand, as a decrease in macroeconomic confidence may also mean an increased uncertainty on the expected real returns on FA. The significant increase in the large sized firms' GSS with an increase in CONF, and thus with a decrease in the perceived macroeconomic uncertainty lends a strong support to the

speculative motive argument. The part of GS held due to the precautionary motive may be expected to be relatively larger for small and medium sized firms, and consequently the impact of uncertainty may be indeterminate for them. The statistical insignificance of the CONF coefficient for the small and medium sized firms may thus be reflecting such a portfolio choice. An increase in the real rate of return on GS leads to a significant increase in the GSS of all the manufacturing firm groups. This impact tends to be higher for small sized firms than the others.

Table 7 reports the estimation results for the ONF firms. The determinants of GSS of the ONF firms are broadly in line with their FAS as reported by Table 4. There is some degree of persistence in their GSS but the adjustment is relatively rapid whilst the speed of adjustment does not vary significantly among small, medium and large sized ONF firms. The firms increase their GSS with their profitability and the profitability impact monotonically increases with the firm size. The large sized (and to a certain extent medium sized) ONF firms with higher debt tend to hold more GS plausible due to their better access to international financial markets allowing them to borrow in order to buy high yielding government securities when the conditions are perceived to be favourable.

Contrasting to the case for the manufacturing firms, the asset tangibility increase with the size of the ONF firms (Table 1). The asset tangibility variable (COL), however, is significant only for the medium sized ONF firms. The negative COL coefficient is consistent with a behaviour that the firms' need for GS as a liquid collateral decreases with their asset tangibility. The insignificance of COL for the large and small sized ONF firms, on the other hand, may reasonably be explained by their holdings of GS predominantly for speculative and/or hedging motives. An increase in the macroeconomic uncertainty leads medium sized ONF firms to increase their GS portfolios. When interpreted in conjunction also to the COL coefficient estimate, the precautionary motive tends to be dominating in their GSS. For the large and small sized ONF firms, on the other hand, the positive precautionary demand affect in the presence of higher uncertainty is offset by the negative speculative demand affect leading to an insignificant CONF coefficient. As for the FAS, the response of the GSS to the real government bond interest rates is significantly positive for medium and small sized firms. The insignificance of the RG variable for the FAS of the large sized ONF firms appears to be the case also for their GSS. The persistently high real rates of returns on government debt instruments seems to lead the large sized ONF firms to financially adapt by allocating a certain proportion of their excess cash flow into GS.

Table 6. The Determinants of the Government Securities Holdings：Manufacturing Industry Firms

	Subsamples Estimates				(6.5) Combined Equation		
	(6.1) Whole Sample	**(6.2) Large**	**(6.3) Medium**	**(6.4)Small**		**Type = Small**	**Type = Medium**
GSS_{it-1}	0.274*** (0.0299)	0.350*** (0.0527)	0.296*** (0.0440)	0.240*** (0.0438)	0.350*** (0.0527)	-0.110* (0.0685)	-0.054 (0.0687)
$PROF_{it}$	0.026*** (0.0064)	0.056*** (0.0201)	0.015*** (0.0057)	0.041*** (0.0139)	0.056*** (0.0201)	-0.015 (0.0244)	-0.041** (0.0208)
LR_{it}	0.009** (0.0032)	0.001 (0.0089)	0.004 (0.0028)	0.019** (0.0086)	0.001 (0.0089)	0.018 (0.0124)	0.003 (0.0094)
COL_{it}	-0.043*** (0.0096)	-0.109*** (0.0201)	-0.034** (0.0177)	-0.009 (0.0102)	-0.109*** (0.0201)	0.101*** (0.0225)	0.075*** (0.0267)
$SIZE_{it}$	0.619*** (0.0991)						
$CONF_t$	-0.006 (0.0036)	0.035*** (0.0133)	0.004 (0.0062)	0.001 (0.0043)	0.035*** (0.0133)	-0.035*** (0.0139)	-0.031*** (0.0146)
RG_t	0.006 (0.0045)	0.015*** (0.0080)	0.013*** (0.0049)	0.030*** (0.0039)	0.015*** (0.0080)	0.015* (0.0089)	-0.002 (0.0094)
Constant	-2.297*** (0.5594)	1.088 (1.4706)	1.268 (0.7607)	-1.161 (0.8489)	1.088 (1.4706)	-2.249 (1.6981)	0.181 (1.6558)
Obs.	25350	3014	7910	14426	25350		
No. of firms	6287	385	1521	4381	6287		
Diagnostics	$\chi^2_W(7) = 345.00]$ P[H-S] = 0.00 m1 = -11.6 [.00] m2 = 0.89 [0.38]	$\chi^2_W(6) = 142[0.00]$ P[H-S] = 0.98 m1 = -6.83 [0.00] m2 = -0.34 [0.73]	$\chi^2_W(6) = 70[0.00]$ P[H-S] = 0.00 m1 = -6.97 [0.00] m2 = 1.60 [0.11]	$\chi^2_W(6) = 115[0.00]$ P[H-S] = 0.00 m1 = -6.62 [0.00] m2 = 0.30 [0.77]	$\chi^2_W(20) = 505$ [0.00] P[H-S] = 0.00 m1 = -11.6 [0.00] m2 = -1.08 [0.28]		

Notes: N is the effective number of firm-year observations. The values in parentheses are the coefficient standard errors (d.f adjusted) that are robust to within cross-section residual correlation and heteroscedasticity (Arellano, 1987). *, ** and *** denote the significance at the 10, 5 and 1 %, respectively. m1 and m2 are the Arellano and Bond (1991) tests for first-order and second-order serial correlation, asymptotically N(0,1). χ^2_W is the Wald test for the joint insignificance of the explanatory variables, with p-values given in [.]. P[H-S] reports the p–value of the Hansen-Sargan test for instrument validity and overidentification restrictions. In (3.5) the columns under $Type_1$ and $Type_2$ reports the coefficient estimates of the corresponding variables interacted with dummy variables defining small and medium sized manufacturing industry firms, respectively.

Table 7. The Determinants of the Government Securities Holdings: Other Non-financial Firms

	Subsamples Estimates				(7.5) Combined Equation		
	(7.1) Whole Sample	**(7.2) Large**	**(7.3) Medium**	**(7.4) Small**		**Type = Small**	**Type = Medium**
GSS_{it-1}	0.347*** (0.0497)	0.350*** (0.0508)	0.298*** (0.0673)	0.362*** (0.0792)	0.350*** (0.0508)	0.013 (0.0941)	-0.052 (0.0844)
$PROF_{it}$	0.022*** (0.0093)	0.086*** (0.0307)	0.031*** (0.0123)	0.026** (0.0120)	0.086*** (0.0307)	-0.060** (0.0329)	-0.055* (0.0330)
LR_{it}	0.003 (0.0028)	0.025*** (0.0143)	0.005* (0.0031)	-0.001 (0.0040)	0.025*** (0.0143)	-0.025* (0.0147)	-0.020 (0.0146)
COL_{it}	-0.014 (0.0095)	0.033 (0.0258)	-0.067*** (0.0214)	-0.012 (0.0103)	0.033 (0.0258)	-0.016 (0.0278)	-0.071** (0.0335)
$SIZE_{it}$	0.449*** (0.1420)						
$CONF_t$	-0.013*** (0.0043)	0.013 (0.0116)	-0.196** (0.0096)	-0.006 (0.0040)	0.013 (0.0116)	-0.192* (0.0122)	-0.033*** (0.0150)
RG_t	0.017*** (0.0059)	-0.001 (0.0112)	0.025*** (0.0082)	0.035*** (0.0059)	-0.001 (0.0112)	0.036*** (0.0127)	0.027*** (0.0138)
Constant	-1.0007 (0.6432)	-2.072 (1.4810)	3.477*** (1.1683)	0.615** (0.4373)	-2.072 (1.4810)	2.688* (1.5442)	5.549*** (1.8864)
N	26507	2176	5546	18785	26507		
No. of firms	8532	398	1443	6691	8532		
Diagnostics	$\chi^2_W(7) = 258$ [0.00] P[H-S] = 0.01 m1 = -8.69 [0.00] m2 = -0.51 [0.61]	$\chi^2_W(6) = 68$ [0.00] P[H-S] = 0.99 m1 = -4.81 [0.00] m2 = -0.21 [0.84]	$\chi^2_W(6) = 78$[0.00] P[H-S] = 0.00 m1 = -5.27[0.00] m2 = 0.17 [0.87]	$\chi^2_W(6) = 100$[0.00] P[H-S] = 0.11 m1 = -5.40 [0.00] m2 = -1.33 [0.18]	$\chi^2_W(20) = 409$ [0.00] P[H-S] = 0.00 m1 = -8.84 [0.00] m2 = -0.59 [0.55]		

Notes: N is the effective number of firm-year observations. The values in parentheses are the coefficient standard errors (d.f. adjusted) that are robust to within cross-section residual correlation and heteroscedasticity (Arellano, 1987). *, ** and *** denote the significance at the 10, 5 and 1 %, respectively. m1 and m2 are the Arellano and Bond (1991) tests for first-order and second-order serial correlation, asymptotically N(0,1). χ^2_W is the Wald test for the joint insignificance of the explanatory variables, with p-values given in [.]. P[H-S] reports the p–value of the Hansen-Sargan test for instrument validity and overidentification restrictions. In (3.5) the columns under $Type_1$ and $Type_2$ reports the coefficient estimates of the corresponding variables interacted with dummy variables defining small and medium sized manufacturing industry firms, respectively.

V. Financial Crowding-Out and the Consequences of the Firms' FA Holdings

The conventional wisdom assuming perfect frictionless markets suggests that firms' real decisions including investments are invariant to both their balance sheet structures and macroeconomic conditions in the economy (Modigliani and Miller, 1958). The credit channel literature, on the other hand, considers capital market imperfections and provides two complementary ways that the firms' financial positions can affect real economic activity (Bernanke *et al*., 1999 and Gertler *et al*., 2003). The bank lending channel focuses on the asset side of the bank's balance sheets and discusses the impact of changes in credit conditions on the investment/spending decisions of borrowers (firms). Under the balance sheet channel, on the other hand, it is the balance sheet of borrowers, rather than lenders, which matters for finance costs and thus real outcomes.

Contrasting with the predictions of the Modigliani-Miller framework with perfect capital markets, the results presented so far strongly suggest that the liquid financial asset holdings of the corporate sector can be explained both by transactions-cum-precautionary and speculative motives along with the macroeconomic condition variables in Turkey. Consistent with the presence of a balance sheet channel, the firms' real investments, in this context, may not be invariant to their financial positions. The strong speculative motive for the holdings of financial assets (FA) and government securities (GS), on the other hand, may be interpreted as lending a preliminary support for an argument that the firms' financial investments crowd-out their real investments. In Turkey, the financial system is predominantly bank-based and the banks tend to finance public sector deficits with their rather limited sources (Aydın *et al.,* 2006). An increase in the public sector borrowing requirement, in this context, can change the credit composition of the asset side of the bank's balance sheets by draining the sources available to the corporate sector. In such a case, the real investments of firms may be determined also by the changes in the credit conditions as suggested by the bank lending channel of the balance sheet literature.

To the best of our knowledge, there is no empirical study using firm level data investigating the consequences of government debt finance on real investments[19]. This

[19] IMF (2006) provides a notable exception in considering public sector deficits as a relevant variable to explain firms' demand for liquid financial assets. IMF (2006, p. 155) notes that "the general government balance-to-GDP ratio was introduced, as it may affect availability of external financing and also to capture the possible offset between corporate and government saving". Such a reasoning might be the case also for the corporate investments and government dissaving as discussed by a large body of macroeconomic literature but frequently ignored in microeconometric models of investment.

may be viewed as reasonable for a market-based system or a bank-based system with government debt instruments constituting only a negligible part of the commercial banks' assets as have been the case for most of the advanced industrial countries. The theory, however, may not strongly justify such reasoning as government debt finance may have real affects under a non-Ricardian world even if it is not held mainly by commercial banks. Government domestic debt finance can alleviate or relax the firms' financial constraints by draining the available resources in the economy or by providing liquidity services, respectively. Government debt instruments, especially those with short maturities, provide liquidity services and can be used as financial collateral. As Woodford (1990) and Holmstorm and Tirole (1998) argue, government debt as net wealth may thus crowd-in private investment by relaxing liquidity constraint in non-Ricardian economies with imperfect capital markets. However, these affects of the government debt may not be invariant to the financial development, the mode and the level of public debt finance. Substantially high levels of government borrowing from domestic markets not only can drain limited sources for investment but also can lead to an upward pressure on interest rates except possibly in a perfect Ricardian world. The financial crowding out affect might be expected more severe for bank dependent firms when the public debt is financed through the commercial banking system. The lack of an adequate financial depth can amplify the crowding out problem as substantially large shares of public debt in the domestic financial system can decrease the overall liquidity with increasing the country risk premium and thus reducing capital inflows (Caballero and Krishnamurthy, 2004). Under these conditions, fiscal contractions can be expansionary as they alleviate the credit constraint of firms.

We consider the following accelerator model of investment[20] augmented with PSBR (public sector borrowing requirement as a per cent of GDP):

$$INV_{it} = \alpha_1 INV_{it-1} + \beta_1 S_{it} + \beta_2 CF_{it} + \beta_3 FAS_{it} + \beta_4 PSBR_t + u_i + \upsilon_t + \eta_{it} \qquad (5)$$

where INV is the real investment rate measured as the annual change in real tangible fixed assets (RTA), S is the ratio of real net sales to the beginning of the period RTA (RTA_{t-1}), CF is real cash flow measured as earnings before extraordinary items and depreciation over RTA_{t-1} and FAS is the ratio of financial assets to total assets as defined earlier. All the real variables are obtained by using the CPI deflator. To test whether the coefficient

[20] See Schiantarelli (1996), Hubbard (1998), Mairesse, Hall and Mulkay (1999) Bond and Reenen (2006) and the references therein for the recent surveys of the investment models.

estimates do not vary across different firm groups, we also augment equation (5) with all the explanatory variables interacted with dummy variables defining the small and medium sized firms. The equation contains also the lagged dependent variable INV_{it-1} to take into account the potential quadratic and persistent adjustment costs. Gilchrist and Himmelberg (1998) shows that the sales growth variable S proxies the marginal profitability of capital (MPK) given that the underlying production function is Cobb-Douglas. The coefficient of S can also be interpreted as reflecting the accelerator effect since an increase in sales signals more demand for the firm's output leading to an increase in investment. The cash flow variable (CF), on the other hand, represents basically the financial condition of the firm[21] and may contain also information on future investment opportunities along with the MPK (Gilchrist and Himmelberg, 1998; Bond *et al*., 2003). In the absence of a speculative-led motive leading real and financial investments to be substitutes, the amount of FA holdings may be interpreted as "financial slack" (Myers and Majluf, 1984). Under capital market imperfections, the precautionary FA holdings allow firms to undertake profitable projects which would not be the case otherwise and therefore may be expected to have a positive coefficient in an investment equation.

Our data set contains no information whether the firms are listed in the stock exchange therefore we are unable to compute a Tobin's Q proxy such as the market value of assets relative to the book value. However, under certain conditions, the accelerator and the Q-theoretic models may be related to each other as neatly shown by Gilchrist and Himmelberg (1998). In the context of the Tobin's Q framework under financial frictions, Gilchrist and Himmelberg (1998) shows that investment can be specified as a function of the expected present values of the MPK and financial state variables of the firm including cash flow and liquid financial assets representing "fundamental Q" and "financial Q", respectively. Under perfect capital markets with no financial frictions, the share prices correctly reflect fundamentals and thus expectations on MPK are given by the firm's stock market valuation. In such a case, the fundamental Q is equivalent to the conventional Tobin's Q. However, under capital market imperfections, the use of Tobin's

[21] As noted by Gilchrist and Himmelberg (1998), the cash flow (CF) variable provides additional sources of independent variation from the sales (S) variable as it treats taxes payable and interest payments as fixed costs and contains also internal funds generated from financial investments and other non-operating assets. The simple correlation coefficients between CF and S for our samples of all, large, medium and small sized manufacturing industry firms are respectively computed as 0.08(0.00), 0.04 (0.00), 0.12(0.00) and –0.32 (0.00), with the values in parentheses are the p-values. This supports that CF provides additional information which is distinct from S.

Q may be misleading[22] as it may contain also changes in the expected financial status of the firm (Gilchrist and Himmelberg, 1998). Gilchrist and Sim (2006) note that, if S_{it} and CF_{it} follow a first-order autoregressive process, then their expected present values and current values are proportional supporting their use in (5). Similarly, in the context of the conventional Euler based accelerator model, the current values of S and CF can be shown to describe the changes about the expected values of MPK and financial conditions, respectively[23] (Mairesse, Hall and Mulkay, 1999). In such a case, the Q-theoretic model by Gilchrist and Himmelberg (1998) may be observationally equivalent to the accelerator model.

In the Modigliani and Miller world of perfect capital markets, only the MPK (sales growth) or the fundamental Q should be significant. The significance of any of the rest of the variables may thus be interpreted as reflecting some capital market imperfections including the presence of financial constraints. This is indeed the basic starting point of the studies beginning with Fazzari, Hubbard and Petersen (1988) attempting to investigate the presence of financial constraints. According to Fazzari *et al.* (1988, 2000) a positive and significant cash flow (CF) coefficient in a Tobin's Q model of investment suggests that firms are financially constrained as they primarily rely on internal funds for financing investment. The costs of internal and external finance tend to diverge due to asymmetric information, monitoring costs and incentive problems. The investment-cash flow sensitivity might be expected to increase monotonically with the cost premium of external finance for the financially constrained firms (Bond and Söderbom, 2006). The wedge between external and internal finance tends to be higher for smaller firms under capital market imperfections leading them to internal finance as suggested by the pecking-order theory. Consistent with this view, Fazzari *et al.* (1988, 2000) find that the sensitivity of investment to cash flow and thus the degree of financial constraints monotonically decreases with the firm size. As surveyed by Schiantarelli (1996) and Hubbard (1998), a number of empirical studies following Fazzari *et al.* (1988) supported this postulation after classifying firms according to some characteristics maintained to reflect the level of financial constraints that they may be subject to.

[22]There are many other reasons for the misspecification of the Q model including the presence of adjustment and agency costs, market inefficiencies and rational bubbles as suggested by Hubbard (1998), Mairesse, Hall and Mulkay (1999), Bond and Reenen (2003) and elsewhere.

[23] Note that, in the context of Gilchrist and Himmelberg (1998), the current values of S and CF represents the expected present values of MPK and financial conditions under an assumption that S and CF follow a first-order autoregressive process (Gilchrist and Sim,).

The recent literature following Kaplan and Zingales (1997, 2000), however, suggest that there is no consensus on the issue that whether the sensitivity of investment to cash flow reflects the degree of financial constraints. According to Kaplan and Zingales (1997, 2000) financially constrained firms indeed have the lowest sensitivity of investment to cash flow. Similar findings are reported by subsequent studies including Cleary (1999, 2006). Bond *et al.* (2003) finds that the firms in market-based systems have higher cash flow sensitivities than those in the bank-based systems. According to Mizen and Vermeulen (2005) it is not the size but the creditworthiness industry-by-industry that determines the availability of external finance and the cash flow sensitivity. Leaven (2003) and Love (2003) find that financial development reduces the effect of financing constraints on investment in particular for smaller firms. The articles in Galindo and Schiantarelli (2003) based on the application of the Fazzari *et al.* (1988, 2000) methodology to firm level data for several Latin American countries provide mixed results for the relationship between firm size and the cash flow sensitivity.

Under capital market imperfections, the distinction between the financial Q and fundamental Q may not be clear and the financial Q represented by cash flow may convey information also on expected profitability and future investment opportunities that are not fully accounted for by the fundamental Q and thus MPK (Bond and Reenen, 2006 and Gilchrist and Sim, 2006). Furthermore, even in the absence of capital market imperfections, financial variables may be relevant for investment to the extend that they contain information about the expected marginal value of capital (Gilchrist and Sim, 2006). The seperability between real and financial decisions does not hold if the firm faces imperfect capital markets as argued by Bond and Reenen (2006). In the same vein, Hubbard (1998, p. 206) states that "it is important to consider investment and financial policy jointly; firms may, for example, accumulate liquidity as a buffer against future constraints". These arguments, albeit maintaining that the firms' financial decisions are motivated by transactions and precautionary demands, may perfectly be consistent for profit maximizing firms investing in financial assets due to a speculative motive in the face of favourable expected relative real returns. In such an important but somewhat neglected case by the literature, financial investments of non-financial firms crowd out their real investments. A negative FAS coefficient in the investment equation may thus be interpreted as firms see financial investments as a substitute to their real investments rather than a complement.

Table 8 reports the robust one-step system GMM estimation results for the samples of large, medium and small sized manufacturing industry firms using all the available t-2 (and earlier) dynamic lags of INV_{it}, FAS_{it}, CF_{it}, and S_{it} as instruments. The instrument set contains also the current values of the maintained strictly exogenous variable PSBR. The table reports also the GMM results for the whole sample from the estimation of equation (5) augmented with all the variables interacted with the type dummies defining small and medium sized firms. The equation for the whole sample (8.4) can be interpreted as data-acceptable as it passes all the diagnostics. A similar case applies to the subsample estimates except the Hansen-Sargan test for the medium and to a certain extent small sized firms. The lagged dependent variable INV_{it-1} is insignificant[24] in all the equations at the 5% level suggesting that deviations from the target real investment growth is somewhat transitory.

The sales variable (S) representing the marginal product of capital (MPK, or the fundamental Q) is positive and strongly significant in all the equations. The investment accelerator impact of the sales is significantly lower for the medium sized firms than the others. For the medium sized firms, only the sales variable appears to be significant in explaining investment suggesting that they are the least financially constrained. However, such an interpretation may be misleading as it ignores the fact that the medium sized firms hold substantial amounts of precautionary and speculative financial assets which is not consistent with the absence of financial market imperfections. As indicated by Almeida *et al.* (2004) and elsewhere, financially unconstrained firms have no reason to hold precautionary liquid financial assets. In the absence of a speculative motive, the FA variable should enter with a significantly positive coefficient to the investment equation. If the financial assets are hold purely due to a speculative motive, then the FA coefficient should be significantly negative suggesting financial investments crowding out real investments. The insignificance of the FA variable, in this context, may be interpreted as reflecting the impact of the speculative motive is almost offsetting that of the transactions-cum-precautionary motive for the medium sized firms under financial imperfections. A similar case may be applicable also for the insignificance of the FA for the small sized manufacturing firms.

[24] The empirical results remained virtually the same when we excluded the insignificant lagged dependent variable from the equations.

Table 8. The Determinants of Investment: Manufacturing Industry Firms						
	Subsamples Estimates			**(8.4) Combined Equation**		
	(8.1) Large	**(8.2) Medium**	**(8.3) Small**		**Type = Small**	**Type = Medium**
INV_{it-1}	-0.000 (0.0011)	0.003 (0.0027)	-0.003* (0.0019)	-0.000 (0.0011)	-0.003 (0.0019)	0.003 (0.0027)
FAS_{it}	-0.071*** (0.0169)	0.085 (0.0600)	-0.017 (0.036)	-0.071*** (0.0169)	0.055 (0.0398)	0.156*** (0.0623)
CF_{it}	0.418*** (0.0794)	-0.190 (0.1297)	0.199** (0.0959)	0.418*** (0.0794)	-0.220* (0.1245)	-0.609*** (0.1521)
S_{it}	1.437*** (0.6253)	0.470*** (0.0189)	0.907** (0.4318)	1.437*** (0.6253)	0.531 (0.7599)	0.968* (0.6250)
$PSBR_t$	-0.102** (0.0409)	0.030 (0.0846)	-0.099 (0.1101)	-0.102** (0.0409)	0.003 (0.1174)	0.132 (0.0939)
Constant	2.274*** (0.6030)	-0.699 (0.7363)	1.882 (0.7505)	2.274*** (0.6030)	-0.392 (0.9628)	-2.973*** (0.9517)
N	2373	5618	9026	17017		
No. of firms	379	1481	4238	6098		
Diagnostics	$\chi^2_W(5) = 629[0.00]$ P[H-S] = 0.98 m1 = -3.51 [0.00] m2 = 0.58[0.56]	$\chi^2_W(5) = 761[0.00]$ P[H-S] = 0.01 m1 = -1.80 [0.00] m2 = -0.48 [0.63]	$\chi^2_W(5) = 47.5[0.00]$ P[H-S] = 0.06 m1 = -8.07 [0.00] m2 = -0.14 [0.11]	$\chi^2_W(17) = 1524$ [0.00] P[H-S] = 0.18 m1 = -1.47 [0.14] m2 = -0.51 [0.61]		

Notes: N is the effective number of firm-year observations. The values in parentheses are the coefficient standard errors (d.f adjusted) that are robust to within cross-section residual correlation and heteroscedasticity (Arellano, 1987). *, ** and *** denote the significance at the 10, 5 and 1 %, respectively. m1 and m2 are the Arellano and Bond (1991) tests for first-order and second-order serial correlation, asymptotically N(0,1). χ^2_W is the Wald test for the joint insignificance of the explanatory variables, with p-values given in [.]. P[H-S] reports the p–value of the Hansen-Sargan test for instrument validity and overidentification restrictions. In (8.4) the columns under $Type_1$ and $Type_2$ reports the coefficient estimates of the corresponding variables interacted with dummy variables defining small and medium sized manufacturing industry firms, respectively.

The cash flow (CF) is significant for the large and small sized manufacturing firms. Contrasting with the evidence by Fazzari *et al.* (1988, 2000), the CF sensitivity of investment is significantly higher for the large sized firms. However, this result is consistent with Kaplan and Zingales (1997, 2000) argument that financially constrained firms indeed have the lowest sensitivity of investment to cash flow. As already discussed, the distinction between the financial Q (cash flow) and fundamental Q (sales growth, MPK) may not be clear and the former may convey information also on expected profitability and future investment opportunities that are not fully accounted by the latter. The results by Table 1 suggested that profitability is highest for the large sized and lowest for the medium sized manufacturing firms. The CF sensitivity of investment tends to follow a similar pattern supporting that it reflects profitability and investment opportunities rather than the degree of the financial constraints.

An increase in the FAS leads to a significant decrease in the large sized manufacturing firms' investments. The speculative-led motive of the large sized firms with more financial flexibility and less financial constraints tend to more than offset their transactions-cum-precautionary demand for liquidity. The large sized manufacturing firms thus view financial investments as a substitute to their real investments rather than a complement. The evidence suggesting that financial investments tend to crowd out real investments is further supported by the significantly negative coefficient of the PSBR for the large sized manufacturing firms. In the Turkish bank-based system, the share of bank credits tends to increase with the firm size as reported by Yalçin *et al.* (2005) and Aydin *et al*. (2006). Consistent with the credit channel literature, the draining of the commercial bank resources available to private sector investments with the increase in the PSBR appears to be effective in reducing investments of the firms which are more bank-dependent. As the medium and small sized manufacturing industry firms are more dependent on informal credit relations such as trade credits (Yalçin *et al.*, 2005 and Aydin *et al*., 2006) than bank credits, the negative impact of the changing conditions of the banks' balance sheets with an increase in the PSBR appears to be much less constraining in their real investments. For the large sized firms, we observe a direct an indirect impact of the PSBR. The direct impact is via their speculative motive for FA including GS in the face of substantially higher real returns under macroeconomic uncertainty. This financial crowding out of real investments by financial investments tends to be deepened by the behaviour of the commercial banks as their financial resources to finance real investments

decline with an increase in the PSBR. The contractionary effect of the higher budget deficits is consistent with the "expansionary fiscal contractions" arguments in the literature (Giavazzi *et al*., 2000 and Özatay, 2005).

VI. Concluding Remarks

When there is no financial market imperfections, non-financial firms do not need to hold liquid FA as financial buffers as they can raise funds instantaneously to finance their profitable projects. The conventional literature suggests the presence of capital market imperfections including the informational constraints and asymmetries, credit rationing and moral hazard to explain the firms' uncertainty induced precautionary demand for liquidity. During the last decades, the deepening of international financial integration might be expected to relax the financial constraints that the firms may face and thus potentially reduce their demand for liquidity. Contrary with the predictions of the conventional capital market literature, the firms' holdings of liquid FA tend to increase especially after the late 1990s in many countries. According to IMF (2006), the recent acceleration of financial asset holdings of non-financial firms in the G-7 countries is one of the striking changes in the global financial landscape. IMF (2006, p.136) further observes that "since the 1980s, the corporate sector of the G-7 economies has swung from being a large net borrower of funds from other sectors of the economy to a net lender of funds". This tendency of non-financial firms behaving as financial intermediaries clearly needs further explanation beyond which the pecking-order and trade-of theories of the conventional capital structure literature already provided. An alternative but not mutually exclusive view may be treating non-financial firms as facing a choice between allocating their resources into real and financial investments (Vickers, 1987 and Holmstorm and Tirole, 2000). In such a case, as strongly supported by the results of this paper, financial investments may be a substitute or complementary to real investments depending respectively on whether the speculative or transactions-cum-precautionary motive dominates.

The share of liquid financial assets in the total assets of the non-financial firms in Turkey appears to be relatively high when compared internationally. At a glance, this may be quite surprising for the Turkish economy which suffered from substantially high inflation rates sustained during the most of the period until very recently, macroeconomic instability and two financial crises in the last two decades. According to this paper, the

fact that the FA holdings the Turkish firms is roughly comparable with those for the countries enjoying much lower inflation and stronger macroeconomic policy stance can indeed be explained by the salient features of the Turkish financial system. The Turkish financial system adapted to high inflation and macroeconomic instability by providing domestic currency denominated financial contracts including government domestic debt instruments and time deposits with extremely short maturities and foreign exchange deposits leading to a very high level of dollarisation. This financial adaptation allowed the corporate sector to hold interest bearing financial assets also for their liquidity services whilst hedging them against inflation and currency risks.

The empirical results of this paper suggest that the FA and GS holdings of the Turkish corporate sector can be explained by firm specific factors including profitability, leverage ratio, asset tangibility and size along with macroeconomic condition variables such as real interest rates on government securities and macroeconomic uncertainty. The relative impacts of these variables significantly vary not only across manufacturing industry and other non-financial (ONF) firms but also between the large, medium and small sized firms. The FA and GS holdings tend to increase with firm size and profitability. This contrasts with the transactions-cum-precautionary motive based "economies of scale" argument of the trade-off theory but consistent with the pecking-order theory postulation which takes into account also the impact of profitability for the firms preferring internal finance over external finance. The holdings of FA and GS for both manufacturing industry and ONF firms appear to be relatively persistent reflecting their financial adaptation. The persistence, however, is not substantially high and the adjustments towards the desired FA and GS holdings are not sluggish supporting the presence of the higher cost of being out of equilibrium relative to the cost of adjustment. The adjustment tend to be more rapid for the small firms which is reasonable as the cost of disequilibrium might decrease with the firm size and their better access to financial markets allows larger firms to adjust more slowly without incurring a high level of agency cost.

The precautionary demand for FA increases with macroeconomic uncertainty and financial constraints. Supporting this argument, the FA holdings of the firms, except the large sized manufacturing industry firms as they are less financially constrained, significantly increase with macroeconomic uncertainty (a decrease in the macroeconomic confidence). This result provides a further support to the importance of macroeconomic stability in stimulating the efficient allocation of resources. The response of the demand

for FA to macroeconomic uncertainty may be helpful also in assessing whether they are held predominantly for transactions-cum-precautionary or speculative purposes. An increase in the macroeconomic instability may mean an increased uncertainty also on the expected real returns on FA causing the speculative demand for them to decline. The significant increase in the large sized manufacturing firms' GS holdings with macroeconomic confidence lends a strong support to this argument. The part of the precautionary GS holdings may be expected to be relatively larger for small and medium sized firms, and consequently the impact of uncertainty may be indeterminate for them. The results from the GS equations indicate that the positive precautionary demand affect of higher uncertainty is offset by the negative speculative demand affect for the firm groups other than those classified as large manufacturing and medium ONF. The empirical literature often ignores the role of own rate of return on financial assets implicitly maintaining that there is no speculative demand. The results of this paper, however, indicate that the own rate of return, represented by GS real interest rates (RG), is an important determinant of both FA and GS holdings. The presence of the speculative demand provides a further explanation for the finding that the demand for FA and GS increase with the firm size. The larger firms with less severe financing constraints due to their better access to financial markets are more able to allocate their resources into real and financial investments and thus hold more speculative motive-led FA and GS. Such a behaviour, however, crowds out their real investments. This speculative motive is rather limited for the smaller firms as they are relatively less flexible for holding FA for interest income apart from their liquidity under their heavier financial constraints.

Given the fact that bond issuance has virtually no role in corporate finance in Turkey, the Turkish financial system can be characterised as a "bank-based" rather than "market-based". The level financial deepening in Turkey, however, is rather low even when compared to those of the countries with similar development levels, and banks tend to finance public sector deficits with their rather limited sources. The large sized manufacturing firms are more dependent on bank credits and thus relatively more sensitive to changes in bank credit conditions than the small and medium sized firms which rely heavily on informal credit relations such as trade credits. Supporting this view, the draining of the commercial bank resources available to private sector investments with the increase in the PSBR tend to be effective in decreasing real investments of especially large manufacturing firms. Beside the indirect impact of the PSBR in crowding out of real

investments via worsening banking system credit conditions, we observe also a direct financial crowding out due to the speculative demand for FA.

The results of this paper provide a strong support to the argument that the FA may better be viewed not only as a financial buffer against liquidity shocks but also as a speculative portfolio choice substituting real investments due to their higher real rate of return under macroeconomic uncertainty. Enhanced macroeconomic stability decreases precautionary FA holdings and promotes better allocation of resources. The decrease in the fiscal dominance, on the other hand, not only alleviates the financial constraints that the corporate sector faces but also leads to a decline in the direct financial crowding out via the speculative motive for holding government debt instruments. This provides a firm level evidence based support to the postulation that fiscal contractions can be expansionary.

REFERENCES

Akıncı, Ö., Barlas-Özer, Y. and B. Usta (2005) Dolarizasyon Endeksleri: Türkiye'deki Dolarizasyon Sürecine İlişkin Göstergeler, TCMB Araştırma ve Para Politikası Genel Müdürlüğü Çalışma Tebliği No. 05/07.

Almeida, H. and M. Campello (2006) Financial Constraints, Asset Tangibility, and Corporate Investment, NBER Working Paper No. 12087, At: http://www.nber.org/papers/w12087

Almeida, H., Campello, M. and M.S. Weisbach (2004) The Cash Flow Sensitivity of Cash, *Journal of Finance*, 59, 1777-1804.

Arellano, M. (1987) Computing Robust Standard Errors for Within-groups Estimators, *Oxford Bulletin of Economics and Statistics*, 49, 431-434.

Arellano, M. and S.R. Bond (1991) Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations, *Review of Economic Studies*, 58, 277–297.

Arellano, M. and O. Bover (1995) Another Look at the Instrumental Variables Estimation of Error Components Models, *Journal of Econometrics*, 68, 29–51.

Arellano, M. and B. Honore (2001) Panel Data Models: Some Recent Developments, in J.J. Heckman and E.E. Leamer (eds), *Handbook of Econometrics*, Vol. 5, North Holland.

Aydın, H.İ., Kaplan, C, Kesriyeli, M., Özmen, E., Yalçın, C. and S. Yiğit (2006) Corporate Sector Financial Structure in Turkey: A Descriptive Analysis, Mimeo, Central Bank of Turkey, Research and Monetary Policy Department.

Baum, C.F., Çaglayan, M., Özkan, N. and O. Talavera (2006) The Impact of Macroeconomic Uncertainty on Non-financial Firms' Demand for Liquidity, *Review of Financial Economics* (in press).

Bernanke, B., Gertler, M. and S. Gilchrist (1999) The Financial Accelerator in a Quantitative Business Cycle Framework, in Taylor, J and M. Woodford (eds), *Handbook of Macroeconomics*, Volume 1, North Holland, Amsterdam. pp. 1341-1393.

Blundell, R. and S. Bond (1998) Initial Conditions and Moment Restrictions in Dynamic Panel Data Models, *Journal of Econometrics*, 87, 115–143.

Bond, S. (2002) Dynamic Panel Data Models: A Guide to Microdata Methods and Practice, *Portuguese Economic Journal*, 1(2), 141-162.

Bond, S., Elston, J.A., Mairesse, J. and B. Mulkay (2003) Financial Factors and Investment in Belgium, France, Germany, and the United Kingdom: A Comparison Using Company Panel Data, *Review of Economics and Statistics*, 85, 153-165.

Bond, S. and M. Söderbom (2006) Conditional Investment-Cash Flow Sensitivities and Financing Constraints, Mimeo, Institute for Fiscal Studies.

Bond, S. and J.V. Reenen (2006) Microeconometric Models of Investment and Employment, forthcoming in J.J. Heckman and E.E. Leamer (eds.) *Handbook of Econometrics*, Volume 6.

Bougheas, S., Mizen, P. and C. Yalcin (2005) Access to External Finance: Theory and Evidence on the Impact of Monetary Policy and Firm-specific Characteristics, *Journal of Banking and Finance*, 30(1), 199-227.

Bowsher, C.G. (2002). On Testing Overidentifying Restrictions in Dynamic Panel Data Models. *Economics Letters*, 77, 211-220.

Caballero, R.J., and A. Krishnamurthy (2004) Fiscal Policy and Financial Depth, NBER Working Paper No. 10532.

Cleary, S. (1999) The Relationship between Firm Investment and Financial Status, *Journal of Finance*, 54, 673–692.

Cleary, S. (2006) International Corporate Investment and the Relationships between Financial Constraint Measures, *Journal of Banking and Finance*, 30, 1559–1580.

Dittmar, A., Mahrt-Smith, J. and H. Servaes (2003) International Corporate Governance and Corporate cash Holdings, *Journal of Financial and Quantitative Analysis*, 38(1), 111–133.

Dornbusch, R., F. Sturzenegger and H. Wolf (1990) Extreme inflation: Dynamics and stabilization, *Brookings Papers on Economic Activity*, 1, 1–84.

Ersel, H. and G. Sak (1997) Corporate Sector Behavior Under Uncertainty: The Case of Turkey in the 1990's, *Economic Research Forum 4th Annual Conference on Regional Trade, Finance and Labour Markets in Transition, Conference Proceedings,* pp. 249-254, September, Beirut, Lebanon.

Fazzari, S.M., G.R. Hubbard and B.C. Petersen (1988) Financing Constraints and Corporate Investment, *Brookings Papers on Economic Activity*, 1, 141–195.

Fazzari, S.M., R.G. Hubbard and B.C. Petersen (2000) Investment-Cash Flow Sensitivities are Useful: A comment on Kaplan and Zingales, *Quarterly Journal of Economics*, 115, 695–705.

Flannery, M.J. (1986) Asymmetric Information and Risky Debt Maturity Choice, *Journal of Finance*, 41, 19-37.

Galindo, A. and F. Schiantarelli (2003) *Credit Constraints and Investment in Latin America*, InterAmerican Development Bank.

Gertler, M., Gilchrist, S., and F.M. Natalucci (2003) External Constraints on Monetary Policy and the Financial Accelerator, NBER Working Paper No. 10128.

Giavazzi, F., Pagano, M. and T. Japelli (2000) Searching for Non-linear Effects of Fiscal Policy: Evidence from Industrial and Developing Countries, *European Economic Review*, 44, 1259-1289.

Gilchrist, S. and C. Himmelberg (1998) Investment, Fundamentals and Finance, NBER Working Paper No. 6652.

Gilchrist, S. and J. Sim (2006) Investment During the Korean Financial Crisis: The Role of Foreign-Denominated Debt, Working Paper, Boston University Department of Economics.

Himmelberg, C.P., Love, I. and V. Sarria-Allende (2003) Cash Holding at the Firm Level: Can Transaction Costs Explain it All?, Working Paper,.

Holmstrom, B. and J. Tirole (1998) Private and Public Supply of Liquidity, *The Journal of Political Economy*, 106(1), 1-40.

Holmström, B. and J. Tirole (2000) Liquidity and Risk Management., *Journal of Money, Credit, and Banking*, 32, 295-319.

Hoxby C. and M. D. Paserman (1998) Overidentification Tests with Grouped Data, *NBER Technical Working Paper* No. 0223.

Hubbard, R.G. (1998) Capital-Market Imperfections and Investment, *Journal of Economic Literature*, 36, 193-225.

IMF (2005a) *Global Financial Stability Report: Market Developments and Issues*, April, Ch. 4, Washington DC: International Monetary Fund

IMF (2005b) *Global Financial Stability Report: Market Developments and Issues*, September, Ch. 4, Washington DC: International Monetary Fund.

IMF (2006) *World Economic Outlook, Globalization and Inflation*, April, Ch. 4, Washington DC: International Monetary Fund.

John, T.A. (1993) Accounting Measures of Corporate Liquidity, Leverage, and Costs of Financial Distress, *Financial Management*, 22, 91-100.

Kaplan, S.N. and L. Zingales (1997) Do Investment Cash Flow Sensitivities Provide Useful Measure of Financing Constraints?, *Quarterly Journal of Economics*, 112, 169–215.

Kaplan, S.N. and L. Zingales (2000) Investment-cash flow sensitivities are not valid measures of financing constraints, *Quarterly Journal of Economics*, 115, 707–715.

Kesriyeli, M., Özmen, E. and S. Yiğit (2005) Corporate Sector Debt Composition and Exchange Rate Balance Sheet Effect in Turkey, Central Bank of Turkey, Research and Monetary Policy Department, Working Paper No. 05/16.

Keynes, J.M. (1936) *The General Theory of Employment, Interest and Money*, London: Harcourt Brace.

Kim, C.-S., Mauer, D.C. and A.E. Sherman (1998) The Determinants of Corporate Liquidity: Theory and Evidence, *Journal of Financial and Quantitative Analysis*, 33, 335–359.

Koğar, Ç.İ. and E. Özmen (2006) Sectoral Balance Sheet Fragilities and the Turkish Financial Crisis of 2001, Paper Presented at the Annual Meeting of the ASSA-Middle East Economic Association, Boston, MA., January, 6-8, 2006.

Kuttner, K. and C.S. Lown (1999) Government Debt, the Composition of Bank Portfolios, and the Transmission of Monetary Policy, in K.A. Chrystal (ed.), *Government Debt Structure and Monetary Conditions*, London: Bank of England, pp. 165-189.

Laeven, L. (2003) Does Financial liberalization Reduce Financial Constraints? *Financial Management* 32(1),5-35

Love, I. (2003) Financial Development and Financing Constraints: International Evidence from the Structural Investment Model, *Review of Financial Studies* 16(3), 765-791.

Mairesse, J.B., Hall, B.H. and B. Mulkay (1999) Firm-level Investment in France and the United States: An Exploration of What We Have Learned in Twenty Years, *Annales d'Economie et de Statistique*, 55/66, 27-67.

Miller, M.H. and D. Orr (1966) Model of the Demand for Money by Firms, *Quarterly Journal of Economics*, 80, 413-435.

Mizen, P. and P. Vermeulen (2005) Corporate Investment and Cash Flow Sensitivity: What Drives the Relationship? European Central Bank Working Paper No. 485.

Modigliani, F., and M. Miller (1958) The Cost of Capital, Corporation Finance, and the Theory of Investment, *American Economic Review*, 48, 261-297.

Myers, S. (2001) Capital Structure, *Journal of Economic Perspectives*, 15(2), 81-102.

Myers, S. and N. Majluf (1984) Corporate Financing and Investment Decisions when Firms Have Information that Investors Do Not Have, *Journal of Financial Economics* 13, 187-221.

Opler, T., Pinkowitz, L., Stulz, R. and R. Williamson (1999) The Determinants and Implications of Cash Holdings, *Journal of Financial Economics*, 52, 3–46.

Özatay, F. (2005) Monetary Policy Challenges for Turkey in European Union Accession Process, Central Bank of Turkey, Research and Monetary Policy Department Working Paper No. 05/12.

Özkan, A. and N. Özkan (2004) Corporate Cash Holdings: An Empirical Investigation of UK Companies , *Journal of Banking and Finance*, 28(9), 2103-2134.

Rodman, D. (2005). xtabond2: Stata Module to Extend xtabond Dynamic Panel Data Estimator, Center for Global Development, Washington.

Schiantarelli, F. 1996. Financial Constraints and Investment: Methodological Issues and International Evidence, *Oxford Review of Economic Policy*. 12 (2): 70-89.

Tobin, J. (1958) Liquidity Preference as Behaviour Towards Risk, *Review of Economic Studies*, 25, 65-86.

Vickers, D. (1987) *Money Capital in the Theory of the Firm: A Preliminary Analysis*, Cambridge: Cambridge University Press.

Woodford, M. (1990) Public Debt as Private Liquidity, *American Economic Review*, Papers and Proceedings, 80, 382-388.

Yalçın, C., Çulha, O.Y. and P.Ö. Özlü (2005) Mali Yapı ve Mali Derinliğin Ekonomik Büyümedeki Rolü: Şirketler Düzeyinde Analiz, TUSIAD-Koç Üniversitesi Ekonomik Araştırma Forumu Tartışma Tebliğleri Yayın No. EAF.2005-06.001.

Yılmaz, G. (2005) Financial Dollarization, (De)Dollarization and the Turkish Experience, Turkish Economic Association, Discussion Paper 2005/5.