

The Financial Accelerator and the Global Crisis 2007-2009

The case of Israel

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From Theory to practice: How well the Theory of the Financial Accelerator can explain reality in the case of the Israeli Market, throughout the Global Financial Crisis, 2007-2009

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
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Thank you.

Efart ashury


Abstract

The financial accelerator theory states that when credit market frictions of asymmetric information are present, the effects of small shocks on real economic activity are being propagated and amplified through time. In the case of an adverse shock, for example, the implied contraction in production, investment and consumption will be amplified, which may lead the market to economic distress and downturns. At the heart of this amplification mechanism are endogenous changes within the credit markets that were triggered from the shock, causing e.g. limitations in borrowers' access to credit. This theory further predicts that such credit limitations will be more severe for 'lower-quality' borrowers than to 'high-quality' borrowers – the so called '**Flight to Quality**' hypothesis.

This volume analyzes the effects of the Global Financial crisis (2007-2009) on the Israeli market. Findings show that the effects of the crisis on credit markets differed across sectors: the non-bank markets – in particular the bonds market and Non-Banks Financial Institutes (NBFI) had experienced economic distress throughout 2008, and credit from these markets became limited; whereas the banking system kept resilient through the period and credit extensions grew. These differences across financial sectors are attributed to market frictions present within non-bank markets – as the Financial Accelerator predicts. The effects of the global crisis on the Israeli economy were nonetheless mild and the contraction in real activity was short (i.e. relative to other economies). In particular, these effects were not as severe as theory predicts. Findings then show that other elements of the theory were present: low-quality borrowers were discriminated by lenders, namely the 'Flight to Quality'.

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Introduction

The ways in which 'real' markets interact with financial markets is commonly known as lead-lag relationship: when real activity declines, agents' financial decisions are driven from a lowered need for credit to finance economic activities –production, consumption and investment (i.e. 'Incomes Effects'). Put differently, credit markets *reflect* economic trends in the market.

The **Financial Accelerator** paradigm (Bernanke and Gertler, 1989) pins down an additional channel through which credit markets interact with real activity. This hypothesis states that trends in real activity occur *simultaneously* with endogenous shifts in the credit markets, since the factors that led real activity to shift (e.g. an exogenous shock) will also affect agents' financial health. Indeed, a positive shock to for example demand, will raise firms' production levels, but it will also elevate profits and expected income; a decline in market's interest rate will reduce the price of capital and thus enable higher production levels, but it also raises agents' illiquid equity (i.e. market value of assets). Such endogenous shifts imply that agents' net worth will improve. Thus agents' funding possibilities – internal and external (i.e. debt and equity) – will expand, which in turn enables higher levels of productions - more than is implied from the initial shock. In other words, the financial accelerator mechanism indicates that endogenous changes within credit markets will propagate and amplify the effects of shocks on real activity. In particular, this view ascribes the financial sector to be a **driving force** in economic cycles rather than a mere reflection of the state of the economy.

The additional channel between financial markets and real activity described above is routed in the key link between agents' net worth and their implied funding possibilities. This link will be **negative** when **credit market frictions** such as asymmetries information are present. This is because, with frictions present, deterioration in agents' financial health implies that their default risks on external funds (debt) will grow or that agents' internal funds will decline. Thus in an environment where lenders cannot observe borrowers' financial health, this will typically lead lenders to increase the cost of extended funds or to limit its supply.

One central implication of the financial accelerator theory is the "**Flight to Quality**" (Bernanke, Gertler and Gilchrist, 1996) namely that 'lower-quality' borrowers would be affected from economic shocks more than high-quality borrowers, i.e. their activity will decline first and in higher ratios than high-quality borrowers. This effect arises because

lenders tend to discriminate lower-quality borrowers when losses and uncertainties levels are high. Such discrimination of lenders rises in the presence of credit market frictions because lower quality borrowers require more costly monitoring (for example).

Another important implication of the theory states that the mechanism of the financial accelerator will act as a magnifier of the economy's initial condition (i.e. before the shock). Put differently, if the economy's initial state is poor (e.g. in recession) then the mechanism suggested by the financial accelerator would be more intense (i.e. the implied decline in real activity will be bigger) – compare to if the initial state was good, *ceteris paribus*. This implication was dubbed with the "**Nonlinearity of the Cycle**" (Bernanke et al. 1996; Favara, 2006).

Since the development of the financial accelerator framework many studies have been analyzing the theoretical implications of these ideas. Some of the most central studies are Bernanke and Gertler (1995), Gertler and Gilchrist (1993) and Bernanke, Gertler and Gilchrist (1999). A great share of seminal work has been testing the occurrences of financial accelerator effects empirically. Indeed, there have been numerous adverse economic episodes throughout history that their severity has been attributed to unfavorable development within the credit sector. These examples go all the way back to the Great Depression of the 1930's, when the deterioration of borrowers' net worth impeded them from attaining funds and thus pushed real activity further down (Bernanke, (1983) and Fisher (1933) as referred by Bernanke, (2007, speech)). Other empirical works found financial accelerator effects in for example, the UK (Hall, 2001), Korea (Domac and Ferri, 1998), and in several major EU countries: Germany, France Italy and Spain (Vermeulen, 2000). And more recently, financial accelerator effects may have attributed to the severity of the global financial crisis 2007-2009 in the US (Mishkin, 2008, speech).

The objective of this paper is to test empirically **how well the theory of the financial accelerator can explain reality - in the case of the Israeli market through the global financial crisis of 2007-2009.**

The case of Israel is interesting for several aspects: the financial sector in Israel had changed greatly since 2003 - before the global crisis started. Specifically as a result of several structural reforms executed in these years, non-banks markets have grown rapidly, having been more or less atrophied until then. The share of non-banks in credit extended to the

business sector grew from 28% in 2003 to nearly 50% in 2007; much of this growth was extended through Non-Bank Financial Institutes (NBFIs), and it was mostly via bonds. Thus during this period, the Israeli market was endowed with improvements in the competitiveness levels and from deeper credit markets which enabled credit growth and credit diversification. In other words, the Israeli financial sector was heading to be a market with features similar to other developed economies. Moreover, several market frictions within the **banking system** were reduced in those years, and banks' exposure to various financial risks – market risks, credit risks and centralization risks - declined.

However, within **non-bank markets** particularly in the bonds market and in the NBFIs sector, several market frictions were revealed, in particular agency problems between lenders, borrowers and intermediators as well as the 'distorted competition' i.e. that grants the market power to borrowers (issuers of bonds).

This environment – where the banking system was 'stronger than ever', whereas the other half, the non-bank markets were distorted, still growing (and accordingly inexperienced) - was the starting point of the financial sector when the global shock hit the Israeli market. Moreover, findings from before the crisis show that the growth of non-banks did not benefit borrowers equally: certain sectors ('high-quality') received the bulk of the credit whereas in other sectors ('low-quality') the access to credit did not improve.

Then, given these features of the Israeli market, **the objective of this paper – brakes down to become three questions:** (1) what were the effects of the global shocks on non-bank markets, and in comparison to their effects on the banking system? (2) What were the effects of the global shock on real activity? And: (3) were there indications for Flight to Quality?

Theoretically speaking, it could be seen as if there was a "fifty-fifty" chance that the global shock will lead to financial accelerator effects, i.e. excess decline in real activity (since non-bank accounted for half the market). The 'verdict' then will depend on the interaction between these two halves of the financial sector – banks or non-banks – through the crisis. However, since the financial sector is not isolated, other factors played a role in the dynamics of the shocks, and the scenario implied by theory – of excess decline in activity – was prevented. Specifically, findings will show that the global financial shock led to economic turmoil within the non-bank markets, particular in the bonds market. **But** the effects on the market as a whole were buffered by the government stabilization actions, the strong fundamentals of the market as well as by the banking system that kept resilient throughout the period. The '**price**'

of the crisis and the turmoil in non-banks was absorbed (to some extent) by lower-quality borrowers – in accordance with 'Flight to Quality' speculation.

This paper is organized as follows: chapter 1 begins with a description of the financial accelerator theory. Next chapter 2 describes the Israeli market until 2008 - before the global crisis initiated: in the real market (subsection 2.1) and within the credit markets (subsection 2.2). In chapter 3 I discuss the effects of the global financial shocks on the Israeli market, while presenting empirical findings¹. Finally, in chapter 4 I present a summary of the finding and conclusions.

¹ The empirical discussion is restricted to the Business sector, the data sets are at the sector level (i.e. aggregated by industry or by specific sectors). As mentioned along this chapter, the data available for the empirical discussion was limited, mostly because this paper was in print on April 2010 - at an 'early stage' relative to the 2007-2009 Global Crisis.

1. The Financial Accelerator: Theoretical Discussion

The theoretical analysis of Financial Accelerator effects was originally motivated from the real-world puzzle 'small shocks-large fluctuations': the puzzle of why great fluctuations in aggregate economic activity are caused from what appear to be relatively small shocks. For example, the Energy Crisis of the 1970's initiated from unfavorable changes in oil price; but the implied effect on firms' production costs was found to be relatively small (Bernanke et al. 1996, pp 1).

A feasible solution to this puzzle is that small shocks are being propagated via some amplification mechanism which then produces large cycles. The financial accelerator theory explains the puzzle in this fashion – by focusing on the credit markets. Specifically this theory suggests that a small shock may be propagated and amplified through time, leading thus to business fluctuation – due to endogenous changes within the credit markets, triggered from the shock. These additional dynamics within the credit sector will occur when market frictions as asymmetries information are present.

The mechanism behind the financial accelerator may be described in two stages:

1. A shock to the economy causes endogenous changes in the financial conditions of economic agents (lenders and or borrowers). Thus their access to credit will be interrupted – cost of credit will rise and its supply will decline.
2. Affected financial agents adjust their economic behaviors e.g. borrowing, spending, production and investment accordingly. Thus real economic activity is influenced by more than is implied by the initial shock.

As the two stages of the financial accelerator mechanism suggests, this chapter presents the theoretical reasoning for the financial accelerator in two subsections: First, at the micro level in subsections 1.1, describing credit market imperfections using the Principal-Agent framework, and partial equilibrium in such market. Secondly, at the macro level, in subsections 1.2, describing the implementation of the micro dynamics to the market as a whole and the emanative outcomes. In addition, a schema between theory and practice is presented in subsection 1.3.

1.1. The Principal-Agent Framework and Credit Markets with Frictions.

In order to rationalize the theory of the financial accelerator, this paper uses the Principal-Agent framework implemented in the credit market, following the work of Bernanke and Gertler (1989) and Bernanke et al. (1996).

The Principal-Agent (PA) framework² consists of two types of economic entities that come together to engage in some mutual economic activity (typically trade of some good). In addition, there is some degree of asymmetry in the information relevant to the engagement - in favor of the 'agent', because, for example, only he has free access to the information. The missing information can be thought of as relevant for categorizing the agent into different types: risky or safe in the principal's eye (i.e. agent's interest contradicts or aligned with those of the principal).

There are numerous examples of PA relations in the literature, including: the "market for lemon" – the engagement of a buyer and a seller of some good when they are asymmetrical on the quality of the good; insurance market – insurance suppliers are uncertain about the health and risky activities of their insured; in labor market, employer is uncertain about the effort level of the employee and or about his skills ('Shirking models) and so on.

The nature of asymmetrical engagements implies that the principal is exposed to **agency problems** such as **moral hazard**, i.e. that the agent will choose to be the 'risky' type, if he benefits from doing so; and **adverse selection**, i.e. that the 'risky agents', rather than the safe, will choose the principal's services, to his resentment. Thus in order to mitigate such problems, the engagement typically involves nontrivial costs for the principal – from gathering information about the agent, monitoring his activities, motivating the agent to act in the interests of the principal ('incentive constraints) and so on. These costs are the so called **agency costs**.

In order for the engagement to take place the agent in turn absorbs these costs to some degree – depending on the level of asymmetry and its type (e.g. the outcome is observable but agents' type/actions are not). As well as the parties' attitude toward risks and the type of competition in the market (the market power of each party). Therefore a contract in this framework will include an appropriate degree of securitization of the principal, a suitable set of incentives and

² The main source for the following section is (*Laffont and Martimort, 2002*)

reliable punishments for the agent, and some mechanism for the absorption of the agency costs by the agent.

In credit markets with asymmetrical information, the PA framework describes the lender-borrower relation as they come to negotiate on a loan: The lender ('principal') and the borrower ('agent') are typically asymmetrical on the information they each hold about the borrower's financial health; this includes the borrower's income, assets (extent and value), past debts and future expected cash flows.

Information on borrowers' financial health may be asymmetrical because the borrower has an incentive to conceal it (e.g. a household that applies for a mortgage-loan would not be so eager to mention that he is about to lose his job); or perhaps because the information-revealing instruments in the market are insufficient or non-reliable, e.g. firms' periodic reports are not properly checked by the regulatory authority before being published or the information system is not accessible due to old technology.

A potential borrower's financial conditions³ serve as a proxy for his default probability in repaying the loan or in other words, how risky is the borrower in the lender's eye. Thus it reflects the conflict of interests between the lender and the borrowers. In particular, borrowers with stronger financial stake typically take less risky investment decisions since they have more to lose – their share in the investment or their reputation; in addition such borrowers can typically post collateral for the loan more easily, given a stronger equity value. Thus these borrowers are better aligned with lenders' interest (of attaining successful outcomes in projects undertaken) and are regarded as less risky in the lender's eye (hence they are called 'high-quality' borrowers). On the other hand, borrowers with low financial health are perceived as riskier (i.e. have higher default risks).

Moreover, this reasoning suggests that the agency problems get worsen – i.e. the chances of moral hazard and adverse selection rise – when borrowers' financial health declines. In particular since during downturns, borrowers' financial health declines (the cyclicity of net worth) the **agency problems are counter-cycle**.

³In the literature on financial accelerator, borrowers' financial condition are measured through varying financial variables, including balance sheets, equity capital, leverage level, stock of liquid and illiquid assets, current and expected cash flow and so on. The results however, are similar – attaining financial accelerator mechanism (regardless what led to changes in agents' net worth. Thus in this paper I will address these financial health indicators sporadically without loss of generality.

As borrowers differ in their financial strength (across time as well), lenders are exposed to these agency problems within any given heterogenic pool of borrowers. Thus when issuing a loan, lenders use devices in order to gather information about the potential borrower, these include: **Signaling** – the lender observes borrower's activities that may signal some relevant information about the borrower's default risks. For example, if the potential borrower is also the owner of a public firm (e.g. listed in the securities exchange market), then this can signal to the lender that the borrower is in a good financial health, since raising funds through equity usually requires high capital ratio. It can also assure the lender that monitoring the loan in the future will be costless (through the firm's prospectus and periodic reports). On the other side, if the firm just reduced its dividends payments this can signal that the firm's future outlook is expected to decline or that its current cash-flows are in decline and lenders can take this as a signal for growing credit risk.

Lenders also use **Screening** devices in order to identify the 'good' borrowers among a pool of heterogenic borrowers. Examples of such screening devices include the interest rate and the amount of collateral or equity required from borrowers.

None of these screening devices are 'free' of problems, in particular risk-adding problems.

One important example is the interest rate demanded for a loan: this rate can be 'too high' so it will encourage riskier borrowing due to moral hazard: in order to compensate for the high price of the loan, borrowers will prefer projects with high returns when they succeed but with higher risk for default. On the other hand the interest rate might be 'too low' so the lender's expected return from lending fails to equalize to the opportunity costs of not lending. The interaction between these two considerations may lead lenders (e.g. banks) to choose a suboptimal interest rate that is lower than the market clearing level, i.e. where the demand for credit exceeds the supply. Thus the market converges into '**credit rationing**' disequilibrium. (Stiglitz and Weiss 1981, pp 393-410).

In financial contracts the costs that stems from the agency problems – i.e. costs of gathering information, screening and monitoring the potential borrower – will be transferred to the borrower. The level and way of transferring these costs are specified in the terms of the contract, while defining the distribution of risk between the lender and the borrower.

From the lender's side, the expected return from issuing a loan is being weighed against the opportunity cost of lending, which is reasonably the risk-free interest rate⁴. When lenders are risk neutral, for example, these two costs should equalize.

From the borrower's side, obtaining funds externally (via loan or bonds) in order to finance his economic activities is weighed against usage of his own funds (e.g. cash or selling illiquid assets). The costs of the external funds are the relevant agency costs; the costs of internal funds are the opportunity cost of not using these funds for other activities (invest in government bonds for example or to have them liquid) i.e. the risk-free interest rate⁵. Thus the difference between these two types of costs is a borrower's *actual cost* of obtaining a loan, also called the '**external finance premium**' (Bernanke et al. 1996). Then a borrower's funding decisions are taken with regard to his external finance premium, as well as his risk aversion level and his internal funding possibilities (that may be limited to begin with, for whatever reason). Moreover, for credit markets with frictions, a borrower's funding structure – debt or equity – further affects the borrower's financial and real activities: for example, when a firm is raising funds through capital equity (in the stock exchange) – i.e. when shareholders having (some) control over the firm's actions and capital – then shareholders uses options to better align the interests (and actions) of the firm's managers with their own (Bernanke, 2007, speech). Thus the borrower takes all these considerations into account when making his funding decision.

In the case of perfect and symmetric information – where all the relevant information is known – the agency problems, along with their associated risks, vanish and there are no agency costs. Hence, as partial equilibrium models of frictionless markets predicts, negotiation will lead to 'first-best contracts' where loans are extended whenever it is profitable (i.e. the cost of lending/ borrowing does not exceed the opportunity cost of lending/borrowing) and the terms of the loan-contract stems only from the parties' attitude to risks and each party's market power. Therefore, in this case, the process of matching lenders and potential borrowers is efficient both in 'successful' matches and in achieving the proper distribution of any risks involved (Bernanke et al. 1999, pp 1345).

⁴ Assuming that the lending markets are competitive (lenders do not profit from issuing a loan), the expected return from lending should equal the opportunity cost of the lenders' funds. The latter can be assumed to equal the risk free interest rate, presuming that all loan risks can be fully diversified in risk-less channels (e.g. government bonds). See e.g. Bernanke et al, 1999, pg 1349-1350.

⁵ Since borrowers also have access to risk-free investment, through banks in saving accounts or treasury bills, their opportunity cost can be taken as the risk free interest rate (the case in most literature).

The presence of frictions thus interferes with the efficient allocation of funds and to the matching process of borrowers and lenders, since the parties' optimal choices are distorted by 'agency consideration' e.g. the existence of non-trivial agency costs (and external finance premium). These additional considerations lead to suboptimal contracting in its implied risk-distribution among economic agents, and in the implied funding-structure decisions (since borrowers' funding-options are being further constrained). For example, in this environment, risk averse lender extend loans to a risky business without fully being compensated for the risks he is exposed to, including the risk that the borrower will fail to pay the loan and risks that stems from market's fluctuations (e.g. the interest on the loan is indexed on CPI and the inflation rate declines); a small new firm, unfamiliar to lenders will be able to attain only a share of the funds it applied for or it will pay more than a large old firm. In general, this theoretical sub-optimality is expressed in features of actual credit markets such as the form that financial contracts take (debt, equity, and collateral), or the existence of intermediary's institutes and credit ranking institutes.

Micro Implications: Based on several studies focusing on partial equilibrium in credit markets with frictions (e.g. Bernanke et al., 1996, pg 2-3)⁶, three robust results were found to sum up the engagement of lenders and borrowers in such markets. These results account for the keystones in the financial accelerator mechanism.

First, the external finance premium is positive. Because in a market with frictions, agency problems rule economic relations, their associated risks cannot be fully diversified. This in turn creates agency costs aimed to minimize lenders' risks from the loan. Thus the costs of external funds are more expensive than the opportunity costs of internal funds, in other words the external finance premium is positive.

Second, the external finance premium is depended inversely on a potential borrower's net worth. Because a decline in net worth implies that the agency problem get worsened (as discussed above): when a borrower has less wealth to contribute to project financing the potential divergence of interests between the borrower and the lender rises. This in turn raises the agency costs from the loan, and accordingly the external finance premium required from borrowers rises.

Third, a fall in borrowers' net worth results in a reduction of borrowing and thus in spending, production and consumption. The shifts in net worth and in the external finance

⁶ These results are motivated from the discussion thus far. For a fuller presentation see e.g. (Bernanke et al. 1996 pp 2-3). For model solving see (Bernanke et al., 1999, pp 1346-1355).

premium are forcing borrowers to adjust their financial behavior accordingly i.e. borrow less or attain funds elsewhere; thus their production investments and spending will be constrained.

"To the extent that borrowers' net worth is pro-cyclical (because of the pro-cyclicality of profits and asset prices, for example), the external finance premium will be countercyclical". (Bernanke et al. 1999, pp 1345) Thus, these results predict that in the face of an adverse shock to the economy, borrowers' net worth will fall, and so the external funds premium will rise, and in turn, this will lead to a decrease in aggregate borrowing.

The nature of these endogenous changes in the credit markets is the essence of the financial accelerator mechanism: the real effects of a shock will be amplified and propagated as long as borrowing decisions leads to changes in real economic decisions. In the case of an adverse shock to net worth, the result will be a further contraction in economic activity, e.g. spending, production and employment will decline by more than the shock's initial effect.

1.2. Macroeconomic Implications.

What are the implications of the financial accelerator mechanism on real economy? Are these effects quantitatively significant?

In order to evaluate the real effects and significance of a suggested theory with dynamic implications, one might run a model that supports such dynamics and compare empirical findings with the theoretical findings. In the context of the financial accelerator theory it is thus necessary to check the effects of a shock on real activity, in a way that isolates the causality so that the role of credit markets in the dynamics will *lead* (rather than lag) real activity.

These tasks are not simple considering the complexity of the economic field and the potential identification problems that may arise: for example, an increase in investment spending due to a productivity shock is typically explained with the 'wealth effect'. But even if this explanation may not be adequate in grasping the implied growth in investment, it is difficult to test theoretically that in the dynamic of events changes in agents' financial conditions were an additional motor for these dynamics.

The literature on the financial accelerator is extensive and the bulk of these studies focus on partial equilibrium in credit markets with friction, theoretically or empirically. In recent

decades much work has been done on the macroeconomic dynamics in the presence of a financial accelerator mechanism, and its implications.

In Bernanke et al. (1999) for example⁷, the writers use a richer version of the Dynamic New Keynesian (DNK) model in order to attain the environment of the financial accelerator. This is attained through the inclusion of heterogeneity amongst economic agents – to motivate borrowing and lending; and the inclusion of agency problems in the form of "costly state verification" (CSV) for the borrower's realized return, i.e. it is costly for lenders to view the outcome of projects taken by borrowers. The presence of CSV thus leads to the existence of a nontrivial external finance premium which is absorbed by borrowers in the terms of the contract (given an assumption that lenders are risk averse and borrowers are risk neutral). Solving the model for equilibrium attains the key links between net worth, the cost of funds and investment decisions so that a rise in borrowers' net worth reduces their cost of external funds, which in turn leads to a rise in the investments undertaken. This link holds as long as credit market frictions are present, when they are absent the cost of funds becomes trivial, and in particular will not change with net worth (since lenders can verify borrowers ex-post returns for free). Thus investment decisions will depend only on the profitability of projects (i.e. when expected revenues cover the opportunity costs of funds).

When frictions are present, the mechanism these relations imply is as follow: shocks to the economy that affect borrowers' net worth, will be amplified and propagated through time because changes in net worth lead to inverse effects on borrowers' external finance premium. In the case of an adverse shock for example, funds will become more expensive therefore borrowers' demand for capital and the level of borrowing declines and thus investment expenditure and production are limited.

As long as economic decisions (e.g. investment, consumption, innovation expenditure, production and employment) are taken in accordance with current and expected financial conditions, the aggregated change in economic activity will reflect the additional impact of credit market imperfection on real economy, i.e. the financial accelerator.

Bernanke et al. (1999) further estimate the quantitative implications of the financial accelerator mechanism. Specifically they run several simulations of the model to evaluate the effects of various shocks with and without the presence of a financial accelerator, i.e. the key

⁷ The studies that develop such models differ in features such as: the base model they build upon (Real Business Cycles Model, Dynamic New Keynesian Model); the specific type of credit imperfections they present (source of agency problem, the types of economic entity playing the rolls of the borrower and the lender, attitude toward risk); the factors that affect relevant entities' net worth; open vs. closed markets and so on. For a fuller survey on the literature see Bernanke et al. 1999, pp 1375-1379.

mechanism of the financial accelerator – the inverse relation between the external finance premium and net worth – is muted⁸. Their results are then compared to empirical findings based on US data. The quantitative results they attain and the reasoning behind it are now described:

Response to a monetary shock⁹ An unexpected decrease in the short term interest rate:

Output response is hump shaped – immediate increase and slowly reverting back to trend. In the presence of the financial accelerator output's initial response is greater (by 50%) and more persistent (i.e. output levels are higher in any given time) than when the financial accelerator is muted (the "base-line case").

Investment expenditure response is similar: hump shaped, with greater initial reaction (almost twice as much) and more persistence than without the financial accelerator.

The external finance premium¹⁰

The reasoning behind such amplified and persistent reactions is as follows: the unexpected decrease in interest rate stimulates the enterprisers' demand for capital, investment (in capital) and production ('the wealth effect'). Investment growth pushes up the price of capital which in turn increases borrowers' equity. Thus net worth rises (in their model equity is the main source of shifts in net worth), and accordingly the external finance premium demanded declines. As a result, investment and output will *rise further*.

As the authors discuss in the paper these results – amplitude and propagation – have been supported empirically¹¹. Moreover, the results are robust when considering some other adjustment¹².

⁸ By fixing the external finance premium at its steady state level, not responding to changes in net worth.

⁹ The discussion above - on financial accelerator effects which initiate from **monetary shocks** - support the "credit channel" (described in the next subsection), in a Dynamic new Keynesian framework.

¹⁰ The external finance premium was measured through two spread rates: the difference between the six-months commercial paper rate and the six month T-bill rate as well as the difference between the prime lending rate and the six-months T-bill rate (see 'flight to quality' paragraph for explanation).

¹¹ In the paper they measure empirically an economy's response to monetary shock using VAR auto-regression (to mitigate identification problems in causality). The vector of the Federal Reserve rate is presented as a linear combination of aggregate variables that include: percentage change in GDP, prices and two spread rates which account as proxies for the external finance premium. They discuss however one discrepancy in the model's reaction to shock compared to evidence – the immediate reaction of output in the model is lagging compared to in the evidence. They resolve this differential by presenting investment delays (see also footnote 13).

¹² Another adjustment they make is investment delay of one period (i.e. investments must be planned one period in advance, thus assets prices are determined from *expectations* on investment levels). The simulation shows a hump-shaped response of output that is stronger and more persistent (compared to the baseline case) but that fits quantitatively better to the evidence (compared to the model without investment delays).

One relevant example for such model-adjustment is allowing for heterogeneity across borrowers in their access to credit i.e. presenting two sub-sectors: with constrained access to capital and the other is non-constrained. The quantitative implication of this adjustment is evaluated using simulations of shocks (as in the previous case of one sector). Results show that output and investment responded roughly the same as with one sector – amplitude and persistence. The interesting implication of their experiment is the differential response in investment expenditure across sectors: more-credit-constrained borrowers will increase their investment spending in the light of an expansionary monetary policy by nearly three times more than the less-credit-constrained borrowers. These results give support to the 'Flight to Quality' effect (discussed next) and they are consistent with evidence on investment expenditures.

Other shocks that are tested in the paper: ~~the technology shock and a demand shock~~ ~~the effects of either of these (shocks fixed by positive shifts in the financial accelerator) and~~ - are being amplified and propagated through time as they imply an excess rise of output compared to the baseline case.

The reasoning behind this propagation mechanism is that positive shocks to technology or a shock to demand both leads to an 'investment boom' (since they lower the cost of production and or raises profits). This in turn raises borrowers' net-worth and so the premium on external funds decline, thus allowing the entrepreneurs to take on more external funds and raise investments and production.

Interestingly, the amplitude of the effects on output from these two shocks is similar to the effect of the monetary shock. This suggests that in the presence of a credit market with frictions, the monetary transmission to real economy is a motor for business cycles in as much as real shocks are.

Wealth shock: a positive shock to potential borrowers' net worth (that stems from a redistribution of wealth between borrowers and lender) has a small and short effect on output in the baseline case but is magnified and propagated when the financial accelerator is present. The reasoning behind the amplification mechanism here is similar to the former mechanism in the case of technology and demand shocks (it is more direct).

Therefore, according to the model, the presence of credit market imperfections builds up the contingency that small changes in borrowers' wealth have real consequences. As a result they are possible factors in the initiation of business cycles.

One important implication of this result is that it helps explaining why currency crises have had devastating real effects (Bernanke et al. 1999, 1372-1373): a breakdown in the exchange rate redistributes wealth from domestic borrowers to foreign lenders, i.e. it is equivalent to a wealth shock. The magnitude of this effect will depend on the share of foreign-currency loans in the economy (i.e. the share of loans from abroad that are denominated in units of a foreign currency).

The analyses on the financial accelerator led to two important inferences, namely: 'Non-Linearity of the Cycle' and the 'Flight to Quality'. I now present and discuss both of these effects.

"Nonlinearity of the Cycle" ¹³

The realization of the financial accelerator mechanism becomes worse when the economy's initial state is poorer (e.g. in recession) and vice versa. Put differently, this inference states that the initial state of the economy is used as a buffer to the amplification mechanism of shocks if the initial state was good (in a boom); alternately it will be a magnifier when the initial state is bad (in a recession).

This result stems from the fact that downturns (for example) make the agency problems worse, which in turn magnifies the financial acceleration mechanism.

The reason why downturns/booms make the agency problems worse/better is as follows: The share of internal funds in a project's financing is a proxy for the severity of the agency problem between borrowers and lenders (since it aligns their interests). Accordingly a large share of internal funds requires a small (or zero) premium on external finance, and vice versa. Thus when agents have sufficient level of internal funds, small fluctuations in net worth will have no affect on their access to credit, and so borrowing and spending will not be affected (by more than implied by the traditional 'wealth effect'), in other words, the key relation of the financial acceleration mechanism will vanish. To the extent that borrowers' net worth is procyclical, (due to the cyclicity of assets prices, income, employment), the share of internal funds in the economy will rise in good times and so a smaller share of economic relations are subject to agency problems. Thus the mechanism of the financial accelerator will be buffered.

¹³ This section is based on (Bernanke et al. 1996, pp 4) and (Favara, 2006).

."The Flight to Quality" (FTQ)

The FTQ hypothesis suggests that in an economy with credit market frictions, during cyclical downturns, lenders rush away from low-quality borrowers and use their savings in less risky channels, such as investments with safe returns or high-net-worth borrowers. These predictions on the reallocation of credit imply that low-quality borrowers will reduce their economic activities earlier and to larger extents than high-quality borrowers, thus these borrowers "are likely to bear the brunt of an economic downturn" (Bernanke et al. 1996, pp 1-2).

The implications of FTQ on the rest of the economy may lead to market failures such as a 'Credit Crunch' and 'Credit Rationing'. Certainly, if the share of low-quality borrowers in the market is large, there might be 'spillover effect' to the rest of the market, for example, the rise of a nominal index for the external finance premium may affect the rest of the market by increasing the general index, thus making it more expensive to issue bonds and shares (e.g. index low-ranked bonds falls and infect the general index). Such 'spillover effects' could be particularly damaging if the economy (or a specific industry) is characterized by high leverage levels (debt to assets) or that it relies mostly on external finance for economic activities (Romer, 1996. as referred by Zilberfarb, Kraus and Snir, 2005, pp 98). Another example of such spillover effects may arise when the contraction in real activity of low-quality firms leads to a raise in the market's prices of goods produced by this pool of firms. This in turn should reduce market's demand for it - to the extent that consumers can turn to substitute goods (Greenwald and Stiglitz, 1993, pp 77-78).

The reason why in the presence of credit markets frictions the FTQ hypothesis arises is because in a downturn the cyclicality of net worth exacerbates the agency problems and the agency costs rise (e.g. since the default risks rises). In addition the uncertainty and losses from the downturn causes pessimistic expectations and the levels of risk-aversion declines. Thus lenders' willingness to extend risky loans to borrowers that require (costly) monitoring is less attractive than safer lending channels (in particular, lending to high-quality firms) (Bernanke et al. 1996, pp 4).

Given that borrowers' perceived creditworthiness is increasing with their net worth, lenders will (immediately) turn away from borrowers whose initial creditworthiness was relatively low¹⁴.

The same reasoning also implies differential effects in lenders' screening devices such as interest rates and the amount of collateral: lenders will increase the financial requirements for granting loans such that low-borrowers' requirements will grow by more than those of high-borrowers.

Whichever pattern occurs – the limited supply or the growing requirements – the effect of downturns on markets with frictions will be that lower-quality borrowers experience excess decline in their access to credit (compare to high-quality).

The quantities implication of FTQ was estimated by Bernanke et al. (1999, pp 1373-1375) where they found that in the face of an expansionary monetary shock (monetary rate declines), lower-quality borrowers increased their investments expenditure by more than three times than investments of high-quality borrowers.

Testing the occurrence of the FTQ hypothesis empirically requires **cross-sectional** tests on financial variables (e.g. the external finance premium). This is because such tests can identify if shocks (economic downturns or monetary tightening) affect borrowers from different credit-quality classes in different ways (Bernanke et al. 1996, pp 7). Below I specify several examples of such cross-sectional tests based on Bernanke et al (1996, pp 6-7)¹⁵.

The spread rates – the difference between the yield-to-maturity on private bonds and government bonds (or AAA-private bonds) – is used as an indicator for the external finance premium in capital markets¹⁶. Since these rates represent the yield demanded from debtors relative to risk free rates – which is the opportunity cost of internal funding. In particular, the financial accelerator theory implies that the spread rates will be counter-cycle. Thus when FTQ holds, lower-quality borrowers will experience **larger movements in their spread rates** ('junk bonds') relative to the market's average rate or to the spread rates of high-quality borrowers (high ranked bonds), in the face of an economic shock.

¹⁴ Another way to rationalize FTQ could be that the decline in net worth implies higher agency costs **only** to low quality borrowers. Thus the aversion of lenders from costly monitoring justifies FTQ (above it is the combination of costly monitoring to all borrowers and the aversion to risk that motivate FTQ)

¹⁵ In the paper, low-quality borrowers are small manufacturing firms, with a yearly-cycle of less than 250\$million.

¹⁶ E.g. Bernanke et al. (1999); empirical findings within the US see (Mody and Taylor, 2004, pp167-172)

Bernanke et al. (1996) show that in the US, following 'Romer dates'¹⁷ there was a sharp increase in **issuances of commercial papers whereas bank loans remained relatively flat.**

Given that high-quality borrowers have better access to commercial papers than low-quality firms (who rely mostly on intermediate credit) this evidence supports the FTQ effect¹⁸.

Bernanke et al. (1996) further investigate the effects of Romer dates: They find evidence for **excess reductions in banks' loans** to small firms compare to large firms. The former are considered as lower-quality borrowers since they typically own less equity (that can serve as collateral) or have less internal funds to begin with. Findings also show contractions in the amount of **loans made above-prime** and a decrease in the share of **secured loans**. Since low-quality borrowers are the main customers of these types of loans, such differences indicate that low-quality borrowers received less credit (from banks). In addition the authors found a smaller share of lending was extended to firms **without established lines of banks' credit.**

This indicates FTQ since firms with former lines of banks' credit are monitored (continuously) by banks with respect to many credit risk criteria (e.g. default risks, past debts and expected income). Thus having established lines of banks' credit signals to lenders that borrowers are 'higher quality'. In non-bank lending, they find bond issuance of low-quality firms i.e. **private placements** declined whereas bond issuance of high-quality firms – **public bonds** – rose.

Other evidence for FTQ may be in the **composition of funds' sources** of firms (debt versus equity) – a sharp decrease in the share of external funds in a specific sector (debt via bonds) might suggest a credit crunch in that sector.

Another direction of evidence has to do with the inventory behavior of firms: during an economic recession firms' sales decline, thus their working capital will decline. Sectors that cannot maintain their inventory stocks will use them faster and accordingly their production will decline. Such a channel can be identified when looking in the inventory-sales ratio. If FTQ holds, we will expect the **inventory-sales ratio to decline** among low-quality firms (since they cannot borrow to invest in inventory).

¹⁷ 'Romer dates' are times in which monetary policy is expected to become tightened. (Romer and Romer (1989) as referred by Bernanke et al. (1996).

¹⁸ Specifically, given that the supply of bank loans is limited after monetary tightening (i.e. the 'bank lending' channel discussed in the next paragraph) this result has been interpreted as a 'substitution effect': potential borrowers substitute their banking credit sources to the capital markets (Kashyap, Stein and Wilcox (1993) as referred by Bernanke et al. (1996, pp 6-7). Another interpretation of this result is that it indicates a shift in the 'quality mix' of credit: since high quality firms usually have better access to commercial paper issuance, and since both sectors experience growing necessity of funds during recessions, the rise in commercial papers issuance relative to flat bank loans reflects that credit extensions are given mostly to high-quality borrowers. Both interpretation though support the FTQ effect (see also Gertler and Gilchrist (1993) and Oliner and Rudebusch (1993) as referred by Bernanke et al. (1996, pp 6-7)

This subsection closes with the 'Credit Channel' - the special case where financial accelerator effects are initiated from monetary shocks.

"The Credit Channel":

The 'small shocks-large fluctuations' puzzle presented above is relevant to any type of shock – non-monetary as well as monetary shocks. The special case where a **monetary shock** leads to large real fluctuation in the presence of credit market friction was dubbed the "Credit Channel of Monetary Transmission" or in short, the credit channel (Bernanke and Gertler, 1995). The rationale behind the credit channel is similar to the financial accelerator. Specifically the credit channel rises since monetary shocks affect the financial health of economic entities - borrowers as well as lenders (as discussed next). This channel applies for various monetary shocks that affect the net worth of economic entities, including a sudden change in the interest rate by the central banks, as well as changes in the regulatory requirements that affect lenders' loanable funds, e.g. introducing a higher capital adequacy ratio (Bernanke and Lown, 1992 as referred by Domac and Ferri, 1998)).

The case of a monetary shock is particularly interesting since it implies that central banks may act as *factors* for the amplification of business-cycles rather than as a stabilizing force of the cycle. If central bankers 'miscalculate' the desired rate – by not taking into account plausible channels through which real activity is affected – the sequel downturn of the cycle may lead to recessions or other unintended economic disasters.

The theory on the 'Credit Channel' suggests two sub-channels through which it may work: the 'Balance Sheet' channel and the 'Bank-Lending' channel ((Bernanke and Gertler, 1995) and (Bernanke, 2007)):

'The Balance-Sheet Channel'

A monetary policy shock has an additional effect on real activity since it affects **borrowers'** financial health, in a way that is similar to the 'Financial Accelerator'. For example reducing the monetary rate causes market's interest rates to decline accordingly, and in addition it raises assets' value and thus borrowers' net worth will rise. Then, each of these effects will stimulate real activity: the former is due to the 'cost of capital', whereas the latter is due to the 'financial accelerator'.

'The Bank-Lending Channel'.

Monetary shocks affect the **supply of loans** offered by financial institutes, through its effect on **lenders'** financial health.

Depository institutes as well as non-bank institutes need funds in order to issue loans and to meet any regulation requirements they may face. The sources for these funds are insured/public deposits (savings, current accounts and so on) and non-deposit products (sourced from capital markets). In other words, lending institutes are themselves borrowers. Monetary policy shocks - such as an unexpected change in the interest rate or a tightening of regulatory requirements - may cause erosion or a decline in the balance-sheet of lending institutes. This will require a flow of new funds. But in the presence of financial or technical limitations as well as policy regulation, it might be costly and difficult to attain a sufficient amount of new funds, and will thus lead to a contraction in lending activities. As a result affected borrowers are forced to slow down their spending activities. For example, in the presence of 'cap-regulations' that put upper-bound on the interest-rates a bank can offer to depositors, raising public deposits when required becomes very difficult (given there was no change in the stock of potential depositors). In the USA in the 1960s and '70s - during the life-span of such 'cap-regulation' ('regulation Q'), the Federal Reserve tightening activities resulted in '**Disintermediation**' (i.e. funds are diversified away for banks) since banks could not attract depositors. This scenario was further triggered due to high and vast reserve regulations, and by the fact that the alternative funding sources were not available at that time (i.e. the lack of deep and accessible capital markets). Thus banks lending declined and so bank-dependent-borrowers that were unable to attain credit were forced to constrain real activities (Bernanke, 2007).

Other alternatives for fund-raising - besides insured deposits - may also generate 'Credit Channels' effects: non-deposit funds are typically *more expensive* for banks than insured deposits. The reason for that has to do with the creditworthiness of the bank, and the attitude toward risk of potential lenders to banks (holders of noninsured bank liabilities). The latter are exposed to risk and uncertainties about the credit-quality of the bank, thus – as before – banks' lenders generate an external finance premium in order to minimize banks' default risks. Thus non-deposit fund sources become costly for banks, in contrast to insured deposits – which, by definition – doesn't bear similar risks for the depositors. The costs that the bank experience from non-deposit funds are then being passed on to its costumers – businesses and households, thus making it more expensive for them to borrow.

Monetary-policy's actions enter these settings through its implications on the creditworthiness of lending institution: monetary contraction regime will reduce the banks' credit-quality (since their earnings and assets value decline). Thus banks' access to new funds may be more costly or inaccessible. This forces banks to lend more expensively or to constrain lending activities¹⁹. Either way, bank-dependent borrowers will have to adjust their real activity accordingly, since (by definition) their borrowing alternatives are constrained.

Policy makers and central banks may therefore control the effects of the 'credit channel' by taking actions such as: deregulations; increase depository institutes' access to capital markets; present and enforce debt and liquidity requirements; enable borrowing alternative (for the private sectors) and establish deposit-insurance systems. Such actions and reforms help in building a deep and more competitive financial system, with minimized frictions (Bernanke, 2007).

1.3. From Theory to Practice.

How well the predictions and hypothesizes that stems from the financial accelerator analyses conform to actual economics? Do the lender-borrower relationships that provide the core of the financial accelerator idea fit well to real institutions and financial arrangements? Which relations in the financial markets are expected to be vulnerable to the financial accelerator mechanism?

In order to answer these questions, one must specify the type of economic entities one has in mind; to make a somewhat general picture, I set out the following chart, describing on the one side the *theoretical* characteristics of the players and relations in a financial accelerator environment (according to the theory presented thus far); and on the other side, different types of borrowers and lenders in real credit markets.

¹⁹ Evidences show that loans provided by 'capital-constrained' banks (their capital holdings are close to regulations) were more sensitive to changes in the interest rates than loans originated from highly capitalized banks. The rational behind these findings is FTQ when applied for banks' lenders, i.e. these lenders will discriminate banks according to their 'quality' (that stems from a bank's capital stock). In particular the premium on non-bank funds rises for low-quality banks by more than it will rise for the high-quality banks. See (Bernanke, 2007).

Chart 1.1: From <i>Theory</i> to Practice				
Financial sector (practice) / Characteristics (Theory)	Business sector: Distinction between: small and medium sized entities- SME (less than 250\$million in cycle) and large firms-LE ²⁰ Type of business:		Financial institutes: Including banks and non-banks. Distinction between financial institutes' type of activity: Borrowers (from the private sector and financial markets – domestic and abroad) and Lenders (to the business sector) Type of activity:	
	SME	LE	Borrowing	Lending
<i>Information frictions asymmetrical, incomplete</i>	Exist. SME's financial health is asymmetry for reasons such as it is not published (as public firms) not established (since these firms are new) and so on.	Exist but less (than SME) since their financial health is published in prospectus (public firms), or because they are older and thus built up a reputation and established lines of credit; large cycles can signal high creditworthiness.	Low due to transparency regulations that financial institutes must meet, e.g. sequel monetary reports.	Exist. Lenders face heterogenic pool of borrowers* that is hard to distinguish because of privacy rights, firms' discretion and so on. *Trends of democratization in the access to credit add to the heterogeneity of borrowers.
<i>Agent/principal features: interest and attitude toward risk</i>	Agent. Interests: maximizing firm's profits (since SME are typically owned by its operators or by a small number of shareholders). <u>Attitude toward risk of not</u>	Agent. Interests: complicated due to firms' holding structure: owners, shareholders and managers might be 'separated' thus not have similar interests ²³ <u>Attitude toward</u>	Agent Interests: to attain cheap and sufficient funds (in order to meet regulatory requirements and to increase their lending possibilities thus their profits from	Principal. Interests: to attain their credit funds back, thus maximizing firm's profits. Cases of conflict of interests may rise when lenders are also trustees of firm' public issuances.

²⁰ I use SME as low-quality borrowers in the business sector as common in the literature and it is fairly reasonable (see also subsection 2.2.3 this paper).

There are other business features that can serve as a dividing line between 'low' and 'high' quality firms, including a firm's growth rate (mature or still growing); ownership structure (few small shareholders, owned by its operators); capital structure (debt or equity), access to capital markets; dividends policy (whether it is paying dividends or not); arguing ratio (based on considerations of internal net worth relative to financial requirements); firm's age; whether the firm belongs to a cooperative industrial group; whether firm is listed on an exchange and so on. For a survey of the papers using such criteria see Bernanke et al, (1996, pp 10)

	<u>returning funds:</u> risk aversion is very likely ²⁴ .	<u>risk of not returning funds:</u> neutral /aversion (depend on the conflict of interests)	lending) <u>Attitude toward risk of not returning funds:</u> banks are averse and non banks are neutral ²²	<u>Attitude toward risk of not attaining back the credit:</u> averse / neutral ²¹
<i>The need for costly-specialization ex-ante, in order to overcome information barriers²⁶.</i>	Yes: intermediation costs ²⁵ and costs of loans searching.	Yes: costs of preparing prospectus and costs of ranking agencies. (less subject to intermediation costs since they can attain funds in capital markets)	Yes: similar to LF	Yes. Evaluation /auditing costs and monitoring costs.
<i>Existence of various financial contracts – aiming to mitigate agency problems such as moral hazard and adverse selection.</i>	Yes. <u>For banks loans:</u> high collateral requirements, costs of loans, <u>For private placements:</u> covenants, maximum dividend payments, working capital assets ratio.	Yes <u>For securities:</u> prospectus, covenants, collaterals and limited dividend payments. <u>For banks loan</u> requirements are less demanding than SME's.	Yes. Pay premium on non-deposits funds;	Yes. Lenders charge premium on external finance, due to their auditing costs and monitoring costs. See SME and LE.
<i>Internal funds Vs</i>	Internal funds are cheapest but	Internal funds when is	Internal funds: institute's owners' capital.	

²³ When firm's holding-structure is divided by its owners, shareholders and managers, the firm will be having internal agency problems since these parties have opposite interests: the firm's owners' interests are driven from private benefits of control (e.g. owners trade with own subsidiaries, nominate relatives and such not in the best interest of the firm); the shareholders interests are to maximize the firm's profits (same interests as firms' lenders); whereas the managers' interests are to maximize self benefits (e.g. wage and reputation). In particular, the firm's interests is not fully aligned with its lenders' interests

²¹ The risks of credit losses to lenders arise either because it reduces profits or because it interrupts their own lending activities (since it reduces the financial institutes' creditworthiness in the eyes of their lenders) – see next comment.

²² Banks may be *averse* to their own insolvencies since much of their funds-sources are insured (i.e. deposits) – assuming the premium on these insurances is *differentiated* according to the bank's perceived risk (i.e. to demotivate the bank from engaging in risky lending); non-banks might be *neutral* to their own insolvencies since their fund sources (the public) bear these risks, (though non-banks might be averse to their own insolvencies due to reputation considerations).

²⁴ See e.g. Greenwald and Stiglitz (1993)

²⁵ Almost all types of credit extension to SME are being intermediated (by banks for examples),

²⁶ Costly specialization for overcoming information barriers is any action that is taken ex-ante due to asymmetric information problems (in order to mitigate the problem or simply because the problem exists) and that is costly: From the borrowers' side: paying for ranking agencies; costs of searching for a loan (multiple applications, time, labor); costs from using financial intermediate advisor, and so on.

From the lenders' side these costs include: costs of evaluating a potential borrower's creditworthiness. Auditing costs (to view borrower's balance sheet, the costs of processing time, analyses of data and storage of data), monitoring costs (holding labor that specializes in supervising potential borrowers).

<i>external funds. Capital-structure decisions</i>	not always adequate. External funds bank-loans and non-tradable bonds.	adequate External funds equity and bonds; bank loans.	External funds: deposits (banks) and capital market.	
<i>External finance premium inversely depended on agents' net worth: sensitivity of the premium to changes in net-worth and predicted factors</i>	High and quick to reply. Factors: asset prices; interest rates; demand and productivity shocks (marginal producers); lenders' attitude toward SME and FTQ factors ("elasticity of substitution between low and high quality borrowers")	Low and thus less volatile to changes Factors: share of internal funds; self-reporting is sufficiently reliable ²⁷ .	Low and thus less volatile to changes Factors: institute's net worth (as LF)	—
<i>Possible channels through which financial accelerator may occur:</i>	Flight to quality. Balance-sheet channel.	Balance-Sheet channel Spillovers from other sectors ²⁸ .	Bank-Lending Channel. Flight To Quality.	

This chapter laid down the theoretical grounds of the financial accelerator at the micro level and at the macro level. The next step is to describe the 'initial state' of the Israeli market i.e. before the global crisis in July 2007. This is the objective of chapter 2.

²⁷ Some market-based evidence (on S&P 500 firms) suggests that when lenders value a firm's creditworthiness based on its **self financial-reports** (e.g. prospectus), then the cost of debt will become significantly lower if the firms' board-of-directors and audit committees are large, independent or have high meeting-frequency. This is because such features add to the reliability of the financial reports. (Anderson Mansi, and Reeb, 2004)

²⁸ E.g. in an industry with a large share of low-quality borrowers, than there might be spillover effects of the financial accelerator to the higher-quality firms (see subsection 1.2 in this paper).

2. The Israeli Economy: Pre-crisis features.

The Israeli economy is a small and open economy, developed on the grounds of social welfare. Accordingly, it is characterized with a high level of government involvement in the economy that works along with 'free market' forces.

This chapter describes a number of features of the Israeli economy that are relevant for the following chapters. It is divided into two subsections, first in subsection 2.1, discusses the economy's trends in the years before the crisis. Then subsection 2.2 describes the developments that occurred within the financial sector (banks, non-banks and the SME sector). There is no attempt to present a full survey of the mentioned topics, but rather a general picture with some focus on most relevant issues (i.e. for this paper).

2.1. Economic Growth between 2003 and 2007

In the years before the crisis, the Israeli economy had enjoyed a growth trend that ended the economic recession of 2001-2002²⁹: GDP per capita grew steadily since 2003 and it had a yearly average rate of 5% - one of the highest among OECD countries, and higher than the OECD yearly average of 3% (for the years 2004-2006); the industrial production amounted to an average growth of 6.6%, (compared to 3.1% in OECD)³⁰. The unemployment rate declined continuously in those years so that from the second half of 2004 until to December 2007, unemployment shrank by 30% from 10.9% to 6.8%; (see figure 2.1).

Inflation rates were kept low and steady through those years and within the policy's target range of 1% -3%. This trend in market's prices through the period reflects a long-term trend of prices stabilization that initiated in late 1980, since the execution of the market's Stabilization Program (see A.1). In particular, through these years the monetary authority had built a reputation as being credible in keeping steady inflation and achieving its goals. This was especially valuable in the crisis to come (*Sorenson and Whitta-Jacobsen, 2005, pp 662-676*).

The economic boom in those years was triggered from several factors, including macroeconomic policies (expansionary since 2001); the execution of several structural reforms (including the Bachar reform, a tax reform and the 'pension reform' see subsection

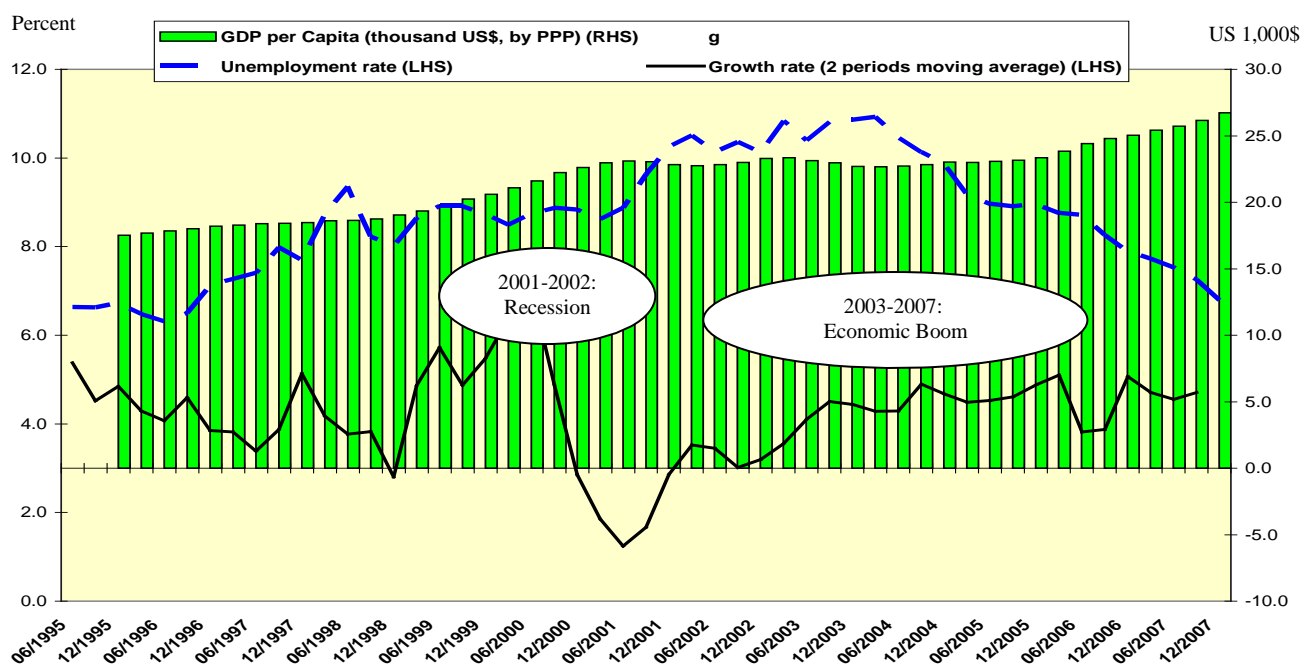
²⁹ See appendix A.1 for a description of the economic trend in Israel from 1948 to 2007.

³⁰ Sources: Organization for Economic Cooperation and Development [OECD], database, (March 2010) and the Bank of Israel [BoI] database, (March 2010).

2.3.2); economic growth in the global arena, in particular the expansion of international trade and globalization and improvement in the security situation.

The economic growth and the state of the Israeli economy received global recognition as Israel's credit-rank rose on November 2007 from –A to A (by S&P ranking agency³¹). And on December 2007 after two years of being an 'observer' in the OECD, Israel was officially accepted to start the process of joining the OECD organization (OECD: Roadmap for the Accession of Israel to the OECD Convention, December 2007).

Figure 2.1: Economic trends: GDP per capita, GDP growth and Unemployment, 1995 - 2007



Source: BoI data, April 2010.

The following describes several prominent features of the Israeli market, supplemented with cross-country comparisons³²:

Expansion of foreign trade and a surplus in the balance of payments: the openness level of the Israeli market – as measured by the weight of import and export in the GDP – has been climbing through the last decade: from 66% in 1995 it peaked to 88% in 2007; this rise was both in export and in imports (though the growth rate in exporting was higher than in

³¹ The rise in the country's rank followed similar rises by Moody and Fitch ranking agencies in 2006.

³² In the following cross-country comparison, I compare Israel to its 'peer' countries, which includes: Belgium, Finland, Greece, Iceland, Ireland, Korea Netherlands and Norway. These countries are similar to Israel in the fact that they are all high-income, with a market that is small and open and hold monetary policies that target price stability (International Monetary Fund: Israel: Staff Report for the 2009 Article IV Consultation [IMF/IS], 2010, pp 71).

importing: in 1995 importing exceeded exporting by 30%, in 2007 their share in GDP was almost equal at 44%).

Chart 2.1: Foreign-trade indicators, as percent from GDP, 1996 – 2008

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
export & import to GDP	64	64	63	71	75	69	74	75	83	86	87	88	82
Balance of payments to GDP	- 4.9	- 3	- 0.9	- 1.3	- 0.8	- 1	- 0.8	1.2	2.4	3.2	5.9	2.6	0.8

Sources: (Central Bureau of Statistics: Statistical Abstract of Israel [CBS/SAI] 2009, tables 15.7 and 15.9) and (Ministry of Finance [MoF] "Trends in the Israeli economy", June 2009).

The growth in Israel's foreign trade was a result of the growth trend in the international trade as well as domestic reforms aimed to increase the openness levels of the market and stimulate exporting and importing. These include promotion of exporting through subsidies and exporting-insurances, promotion of foreign investments and signing trade-agreements. In addition, from 2000 to 2006 the real exchange rate depreciated which contributed to the relative competitiveness level of Israeli goods.

The growth in Israeli **exporting** was governed (more than half) by the high growth rates of exports within the manufacturing industry - 75% of which (average rate, 2000-2008) is in exporting of advanced manufacturing (i.e. computer services, 'high-tech', R&D, chemicals, manufacturing n.e.c.; and medical & scientific equipment).

Israel's main export-regions are the European Union: 33%, the US: 28% and Asia 15% (numbers represent the average share of exporting in 2005 - 2008).

The growth in Israeli exporting along with the rise in investments of residence abroad had contributed to the plus-side of the Israeli balance of payments. As a result the **balance of payments** became positive as of 2003, and it peaked in 2006 - 5.9% of GDP (see chart 2.1).

The public debt relative to GDP declined in recent years, but it remained relatively high in international comparisons. The public debt to GDP declined from 102% in 1995 to 77.9% in 2007 and 76.9% in 2008³³ (see figure 2.2). This decline was a central objective of policy makers since the early 1990's. In order to attain this target, the reductions of the government deficit were anchored by law (1992³⁴), and so the yearly growth rate of public

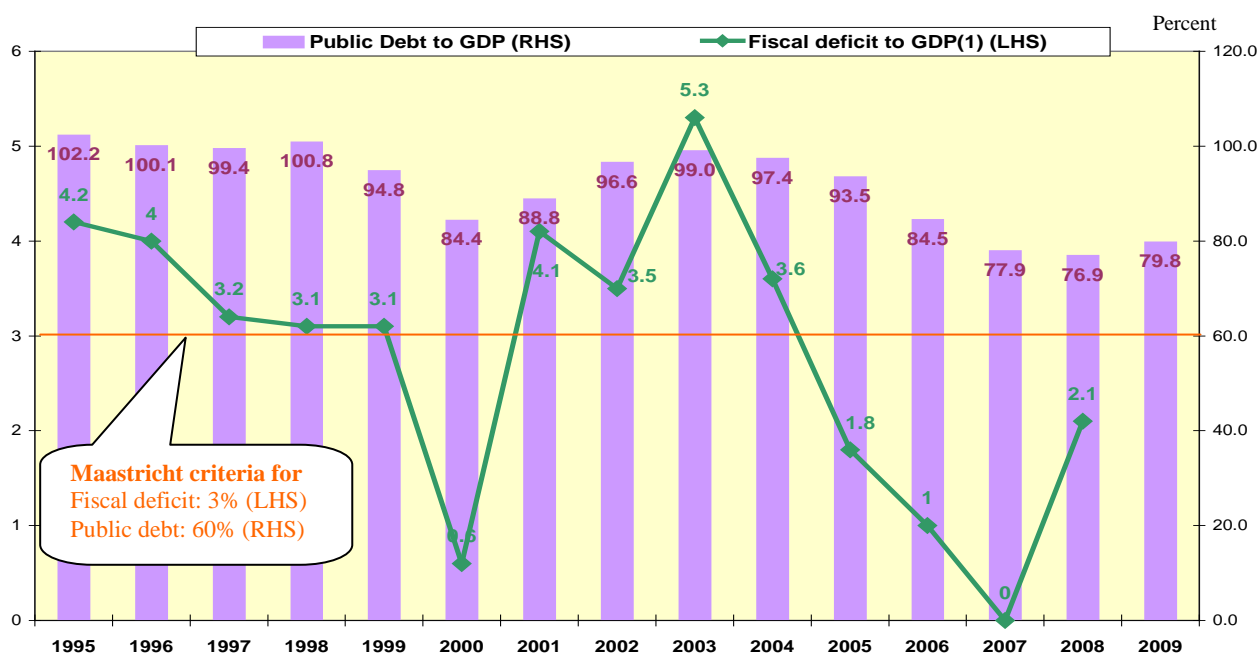
³³ Between 2001 and 2003 the public debt rose due to the recession in those years, but declined again as of 2004, (as shown in figure 2.2).

³⁴ MoF (Ref: Deficit Reduction and Budgetary Expenditure Limit Law 1992, No 5751). This law has been updated several times since, in accordance with the developments in the market. See e.g. (MoF: Israel budget division, state budget proposals for the Fiscal year 2009-2020, pp 45-46).

expenses was limited³⁵. Thus public expenses declined from 4.2% in 1995 it to 0% balance in 2007 (figure 2.2). The improvement in the fiscal budget since 2003 was also driven from the economic growth since 2003 (which amounted in excess income from taxes).

The decent of the fiscal burden benefit the market since it enables fiscal maneuvers – such as an expansionary policy – when necessary. Partly because low fiscal burden implies more resources are available for the market, but also because it helps building the public's trust and improves the creditability of the fiscal authority, which in turn alleviates fiscal activities (in particular since these fiscal goals were anchored by low) (Sorensen and Whitta-Jacobsen, 2005, pp 619-620).

Figure 2.2: Public Debt and Fiscal Deficit, as percent from GDP, 1995-2009.



(1) Exclude credit extended and realized revenues of the BoI.

Source: BoI data, April 2010.

Nonetheless, Israel's public debt to GDP and public expenses to GDP remained relatively high in an international scale (in 2007, see chart). These high rates stem from features of the Israeli market e.g. high past debts, the social grounds of the market (i.e. large scale of subsidizers, see also A1), and a bulk of the government expenses are diverted to security issues (that account for 18% of government expenses to GDP).

³⁵ The upper limit has been updated several times since 1992, in accordance to economic and security events; e.g. in 2004 this growth rate of public expenses was limited to 1% and in 2007 it was updated to 1.7%.

Chart 2.2: Cross-country comparison, Public debt & Public expenses, as percent from GDP, 2007										
	OECD average	Belgium	Finland	Greece	Iceland	Ireland	Korea	Netherlands	Norway	Israel
Public Debt to GDP	58%	87%	42%	104%	28%	29%	30%	53%	76%	77.9%
Public Expenses to GDP	43%	49%	48%	43%	43%	37%	31%	46%	41%	44%

Source: (MoF: "Trends in the Israeli economy", June 2009)

2.2. Developments within the Credit markets

The conventional division of the financial sector into banks and non-banks is particularly important in the Israeli market. This is because of the outstanding differences between these two sub-sectors: on the one hand, the banking system is highly regulated, traditional, and centralized. Whereas the non-bank markets are new, growing and less regulated than the banking system. In the heart of these differences lie the structural reforms executed in the market since 2002.

The next two subsections discuss each of these financial sectors. Then a third subsection discusses the small and medium size entities (SME) sector on which the FTQ hypothesis will be focused (in chapter 3).

2.2.1. The Banking System: centralized, conservative and highly regulated.

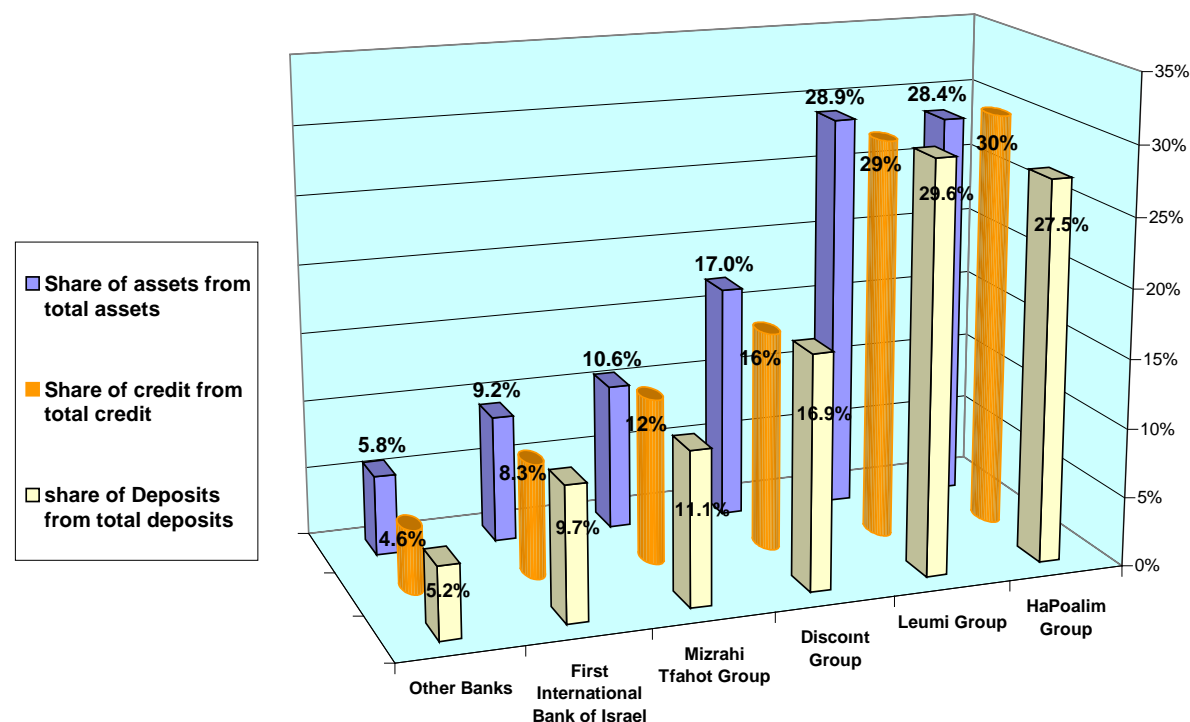
Structure

The Israeli banking system consists of five banking groups: 'Hapoalim', 'Leumi', 'Discount', 'Mizrahi Tfahot' and 'the First International Bank of Israel'. The assets of the five groups account for 94% of total assets in the system. The rest 6% belongs to independent banks – three Israeli banks ('Igud', 'Jerusalem' and 'Dexia') and four foreign ('BNP Paribas', 'HSBC', 'Citibank' and 'State bank of India').

The five groups hold commercial banks, mortgage banks, branches situated abroad credit-card companies (the main activity of the groups outside classical banking activities), financial institutes and bank clearing centers (mutually owned by the five groups, see figure 2.3³⁶).

³⁶ The data presented here is of December 2008; between 2007 and 2008 there has not been large structural changes within the system (i.e. the resilience of the banks throughout that period kept the initial structure, as discussed in subsection 3.2.2). In particular, this data applies for the structure of the system in 2007.

Figure 2.3: The Structure of Israeli Banking System: Assets, Credit & Deposits of the banking groups (on a unified basis) and the other banks. December 2008.



Total assets: NIS 1075 billion.

Total credit to the public sector (domestic and abroad): NIS 736 billion.

Banks assets to GDP (2007): 143.2%

Total Deposits: NIS 826 billion

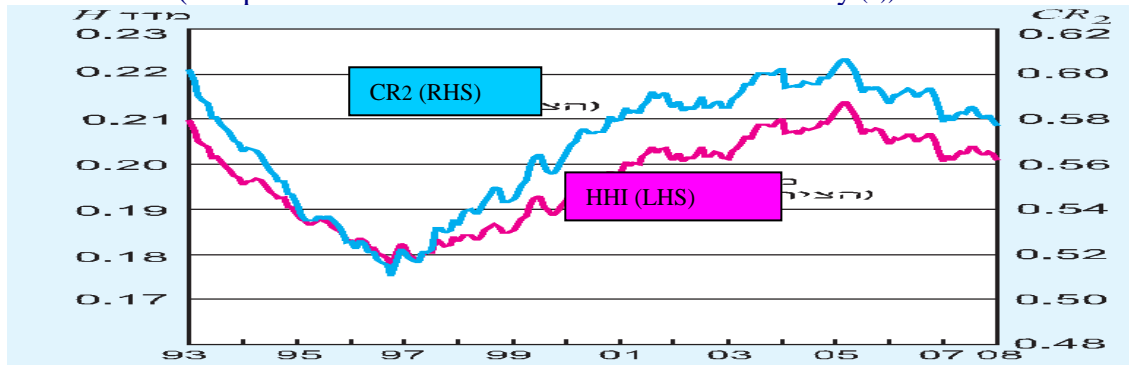
Source: BoI publications: Israel's Banking System in 2008 [BoI/BS], 2009, pp 9-21.

Several outstanding features of the Banking System

Centralization and competitiveness levels

The centralization levels within the Israeli banking system had declined somewhat since 2005 as measured by the market share of the two biggest groups CR2 and by the Herfindahl-Hirschman Index (HHI) (see figure 2.4). This decline reflects several structural changes taken within the system, which transferred more 'weight' to medium-sized banks, these include transferring ownerships of mortgage banks from the biggest banks to medium ones; and merger of small banks with medium and big banks.

Figure 2.4: Centralization levels of the banking system: HHI and market share index (CR2) December 2008 (computed on unindexed credit in domestic currency (1)).



(1)The indexes are measured on banks' yields: HHI is the sum of squares of the bank's yield divided by total yield (on a unified base, unindexed credit); CR2 is the market share of the yields of the two biggest banks (on a unified base, unindexed credit). The values are between 0 and 1, where higher values indicate a high level of centralization. Source: the figure was copied from (BoI/BS, 2009, pp 17, figure A-12)

However the centralization levels remain relatively high in international scales as indicated from the HHI levels for 2007: the level in the Israeli market was 0.195 whereas the average in Israel's reference group was 0.11³⁷. These levels reflect the control of the two biggest banks (duopoly of Hapoalim and Leumi, dubbed with 'Hapoalumi').

A centralized banking system may benefit the market since, for example, it contributes to the supervision of the banks as it is easier to monitor and specialize in each bank (IMF/IS, 2010, pp 78-79). Also, high centralization levels benefit to financial stability since it enables cheaper cartel agreement (between banks as well as borrowers), which in turn reduces the spreads between the price of credit and its marginal costs (i.e. it reduces the market power banks operate against its clients) (Rotenberg, 2005).

However, in Israel the high centralization levels were found to raise the market power that banks operate against borrowers. Thus it implies **low level of competitiveness** in the financial sector (Rotenberg, 2005). For comparison, other economies have centralized banking systems yet attain high competitiveness levels, such as Sweden and the Netherlands (IMF/IS, 2010, pp 79). In particular, the low competitiveness in Israel had been enabled due to lack of contestability within the financial sector (i.e. non-bank markets constitute as a 'threat' only since 2005).

Chart 2.3. Cross-country comparison: Competitiveness levels measured by the P-R index ⁽¹⁾ , 1993-2004									
OECD average	Belgium	Finland	Greece	Iceland	Ireland	Korea	Netherlands	Norway	Israel

³⁷ The HHI index was measured on banks' assets: it is the sum of squares of bank's assets to total assets (non-unified basis of the five biggest banks); values are between 0 and 1, where higher values indicate a high level of centralization. Source: (BoI/BS, 2009, pp 13).

	0.73	0.78	0.76		0.65		0.86	0.57	0.57
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(1) The Panzar & Rosse index measures the competitiveness within a sector by the sum of the elasticity of the production's revenue with respect to production costs. Values are lower than 1 so that: negative values indicate *monopoly* in the industry; values between 0 and 1 indicate *monopolistic competition* and 1 indicates *perfect competition*.

Source: (Ruthenberg, 2006, pp 1-6; pp 19 table 4).

Banks' funding sources: The banking system relies mainly on public-deposits as funding sources, rather than attainment of funds from wholesale markets (domestic or foreign). This 'traditional' funding trend implies that the banks have low exposure to capital markets which thus it protects them from the implied market-risks (i.e. due to fluctuations in capital markets). In addition a strong deposit base mitigates banks' liquidity-risks since these external funding sources are easily accessed (and they are cheaper) thus it reduces banks' liquidity risks (i.e. dried-up funding sources).

This traditional funding of Israeli banks is further reflected in Israel's loan-to-deposit ratio that was much lower than its peer countries:

Chart 2.4. Cross-country comparison: Loans-to-Deposits ratio, end-2007 (percent)									
OECD average	Belgium	Finland	Greece	Iceland	Ireland	Korea	Netherlands	Norway	Israel
	192.1	144.2	220		205.4				89.2

Source: (IMF/IS, 2010, pp 72-73).

Capital adequacy in the banking system has been rising in recent years, maintaining a higher than the required percent of 9% - until 2007, and up to 11.22% in 2008 in accordance with the rise of the capital requirement to 12%. The improvement in banks capital was elevated due to the economic boom since 2003, which contributed to banks' profitability and to their owner capital (see chart 2.5).

Credit Quality had enhanced throughout the last decade, as can be seen from the ratio of nonperforming loans to total loans. This improvement was a result of the close supervision, as well as the growth of non-banks since it allowed the banks to diversify their credit portfolio (i.e. since some firms substitute their credit demands to non banks, banks were enabled credit extensions to more borrowers, see chart 2.5).

Soundness: In recent years, the 'Soundness index' of the banking system had improved (i.e. declined) gradually. The decline in the index reflects improvements in three of its categories: 'assets quality' (credit quality), 'management quality' and 'earnings & profitability' (see chart 2.5).

Chart 2.5: Selected Financial Indicators for the banking system's stability, 2000-2008.			
Soundness index (1)	Nonperforming loans to total gross loans	Capital adequacy (2) (percents),	
2.6			2000
2.9		9.38	2001
2.8	2.45	9.90	2002
2.4	2.59	10.32	2003
2.2	2.55	10.73	2004
2.1	2.33	10.67	2005
2.0	1.94	10.82	2006
1.9	1.91	10.96	2007
2.3	1.78	11.22	2008

(1) The 'soundness index' is a measurement developed by the Supervision department in BoI, which grades the level of soundness of the banks, and the average level in the banking system in total. Grades run from '1' = 'bank is sound in all aspects' to '4' = 'bank is extremely not sound'. The index is determined according to 25 financial relations that belong to the following six categories: capital adequacy; assets quality; management quality; profits & profitability; exposure to liquidity risks and exposure to market risks. The assessment of the index was conducted quarterly

(2) Defined as banks' capital basis to risk weighted assets

Sources: (BoI/BS, 2009, pp 143-150) and (IMF/IS, 2010, pp 72-73 and 26-29).

Regulation: the banking system is supervised by the central bank of Israel. The regulatory requirements are vast, closely monitored and highly enforced – in particular, relative to other countries. These regulations include: quantitative limitation on banks' lending such as upper limits on a bank's exposure to a single industry (up to 20%)³⁸ and limitation on lending to single borrower or borrowers-group (up to 15%)³⁹; limitations of equity-investments abroad; minimum capital adequacy with strict definition and its obligatory reporting (in the spirit of Basel 1-2); high transparency and sequential reports.

The supervision and its close enforcement had contributed to the strong state that banks were in when the crisis initiated and it helped keeping them resilient through the period, as will be discussed in chapter 3 (IMF/IS, 2010, pp 70-71).

On the other hand, such strict supervision has its downsides because it might be "politically driven and thus overdone", "focusing on quantity rather than quality", 'disproportional' and may "squeeze out market flexibility" or simply be cumbersome and non-friendly for businesses. Moreover, according to the 'Banking Banana Skins' reports for 2005 and 2006,

³⁸ BoI regulations: (Ref. Additional expenses to Doubtful Debts, November 1998)

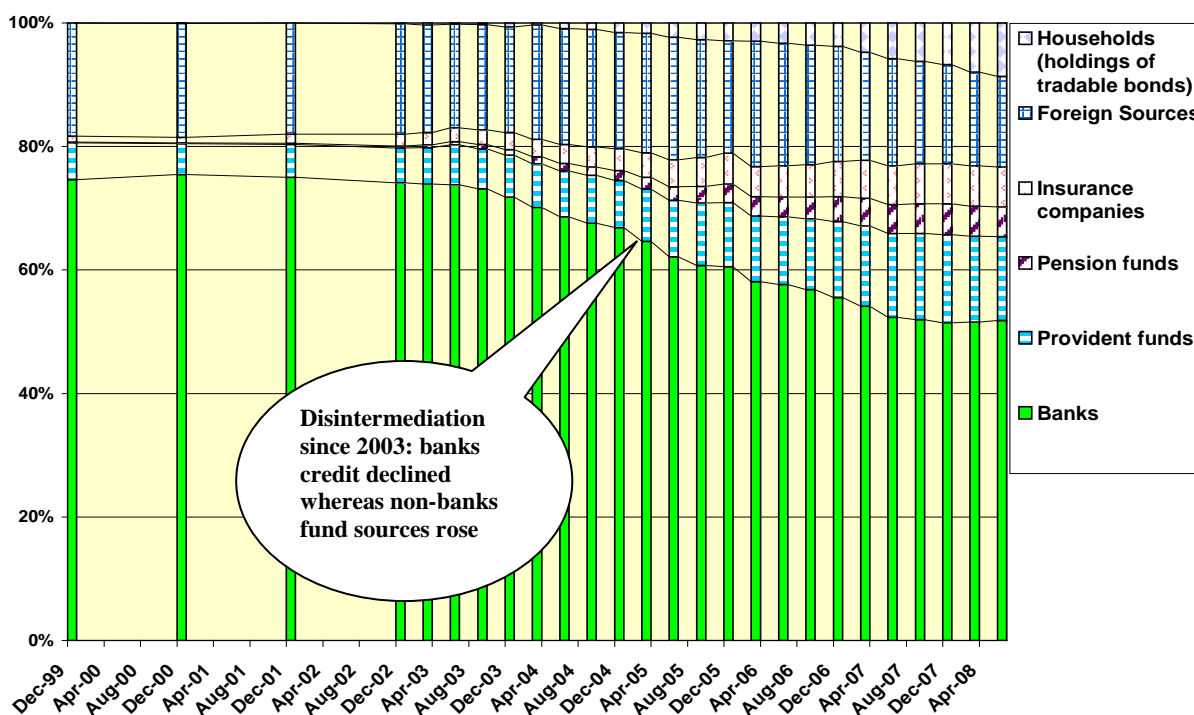
³⁹ BoI regulations: (Ref. Limitation on Indebtedness of a Single Borrower or a Group of Borrowers, December 2004)

'too much regulation' on banks was ranked as the number one cause for banking instability (in particular, more than credit risk)⁴⁰.

2.2.2. Non-Bank Markets

The non-bank markets have been growing since 2003- when they were more or less rudimentary – they became a central channel in the financial sector: until 2003 non-bank markets contributed less than 30% of the credit to the business sector; by 2008 this share rose to nearly 50%. This expansion in non-banks' credit came from all non-banks sectors, but it was governed by the growth of non-banks financial institutes (NBFI i.e. insurance agencies, pension funds and provident funds, see figure 2.5). The growth in non-banks intermediation came along with a decline in banks' intermediation throughout the period (Disintermediation).

Figure 2.5: The Distribution of Credit to the Business Sector, by lender's type (1), 1999 – June 2008.



Source: BoI data, table 3.1 (March 2010).

⁴⁰ Source: Center for the Study of Financial Innovation [CSFI]: Banking Banana Skins 2010 after the quake, 2010, pp 14-17) These ranks were determined according to surveys of banks' related entities such as bankers; non-bankers (i.e. 'close observers of the banking scene') and banks' supervisors, from 49 countries. The quotes are taken from the respondents' answers (pp 17).

The growth of non-banks since 2004 was a result of several factors, the common line between these factors is that they all led to higher demand for non-banks' credit.

The first and probably the most profound factor was the execution of several **structural reforms** in the financial markets through those years. The reforms' objectives included expand, liquidize and perfect the capital markets, while improving the competition in the financial sector. The reforms and their main objectives (and actions) are described in the following chart:

Chart 2.6: Structural Reforms in the Financial Sector, 2002-2007			
The	when	Objective	Main actions taken (and how it was before the reform)
'Government Bonds Market' Reform (1)	2002	Perfect the market for government bonds (i.e. improve the centralization the competition and the access to this market).	<ul style="list-style-type: none"> > Expand the trade in the Primary-Market through e.g. primary dealers were obliged to a minimal extent of purchases; open the government bonds market to bourse dealers (as accepted in other developed countries) > improve the information technology
Tax Reform (2)	2003	<p>Improve the liquidity and trade in capital markets, by encouraging foreign investors.</p> <p>Change the tax base from 'territorial' to 'personal'</p>	<ul style="list-style-type: none"> > Tax-exemption (<i>instead of full tax</i>) to foreign investors on capital revenues and on interest payments that stem from government bonds or deposit. > All revenues of local residents are taxed (<i>instead of taxation only on revenues produced within Israel</i>).
Pension Reform (4)	2003	<p>Save the pension funds from the economic distress they were in.</p> <p>Improve the liquidity and trade in capital markets, by diverting more funds to those markets.</p> <p>Reduce the government's expenses on the pension funds (through interest payments).</p>	<ul style="list-style-type: none"> > Nationalize the pension funds (<i>from being managed by the General federation of workers (Histadroot)</i>). > Divert 70% of the pension funds to capital markets - invested in tradable government bonds and private bonds (<i>rather than 100% going to government' bonds, with 5.7% interest</i>) > Pension payments were 'unified' (<i>rather than varying across type of fund</i>); Reduce the interest payments guaranteed on pension funds to 4.9% (<i>from 5.7%</i>)
Bachar Reform (5)	2005	Improve the competitive in the financial markets and mitigate the conflict of interests routed in the banking system (<i>banks were both investments' advisors and the owners of the investment channels (i.e. provident funds and unit trusts)</i>);	<ul style="list-style-type: none"> > Banks had to sell their provident funds (within 3-6 years – according to the bank's size) and the unit trusts they owned (within 4-7 years – same). The potential buyers were NBFIs domestic and foreign. > Set a unified distribution-commission to the banks (on their distribution of investment funds). Thus banks became objective investment advisors. > Banks were permitted to engage in pensionary advising and selling (and so insurance agents were limited to pensionary marketing)

		In addition, the reform aimed to improve the public's access to pension information (which was needed in light of the last reform)	
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(1) Source: (MoF: Accountant General's Annual Report for the Government Debt, 2003, chapter D, pp 1-10).

(2) Sources: ('Rami Arie & co, Advocates, CPA & Tax consultants': *"The essence of the Tax Reform"*, by Arie, R., June 6, 2004), and ('Rami Arie & co, Advocates, CPA & Tax consultants': *Tax Exemption for Foreign Resident Deposit*, by Pick, L., October 20, 2004).

(4) Source: ('Eretz hatsvi': *"The Reform in the Pension funds"*, by Dr. Sivan D., August 19, 2003)

(5) Source: (MoF: Structural Reforms in the Capital Market, 2004)

Other factors that contributed to the growth of non-bank markets include the gradual decline in the government deficit (discussed in subsection 2.1), which led to a decline in the government's fund raising activities (i.e. bond issuances). This in turn made investors' funds available for the business sector's funding-needs. In addition, the economic boom in the market in these years contributed to the growth of the capital market since it led to a higher supply of funds (higher income led to high savings and investments) and to higher demand for funds.

Although the growth in non-banks was a result of all three reasons above, it was mostly the reforms since 2003 which contributed the most while changing the 'face' of the financial sector as it was until then. The reforms were successful in achieving their goals of improving the competition and mitigating the conflict of interest routed within the banking system; the trade and liquidity within capital markets were improved and sophisticated financial instruments were created. In particular the availability of funds - from non-banks -to the business sector rose. Thus non-banks accounted for 49% of total credit in 2008, a share that is closer to the western standards (e.g. US 79% and EU 47% in 2005).

Specifically, the growth in non-banks' credit according to each sub-sector: the credit from provident funds and insurance institutes rose due to the **Bachar reform**, which led to a rise in the funds managed by these institutes and eased their terms of investments in the capital markets (i.e. they were no longer subject to the regulatory requirements of the banks); the credit from pension funds rose due to the '**Pension Reform**' which diverted these funds to invest in capital markets (rather than in government bonds); the private sector contributed to credit growth due to economic boom (direct investments); and the foreign sector as a result of the **tax reform** that eased the costs of investments (foreign investors were also attracted to the local market because of the high monetary rate since 2005).

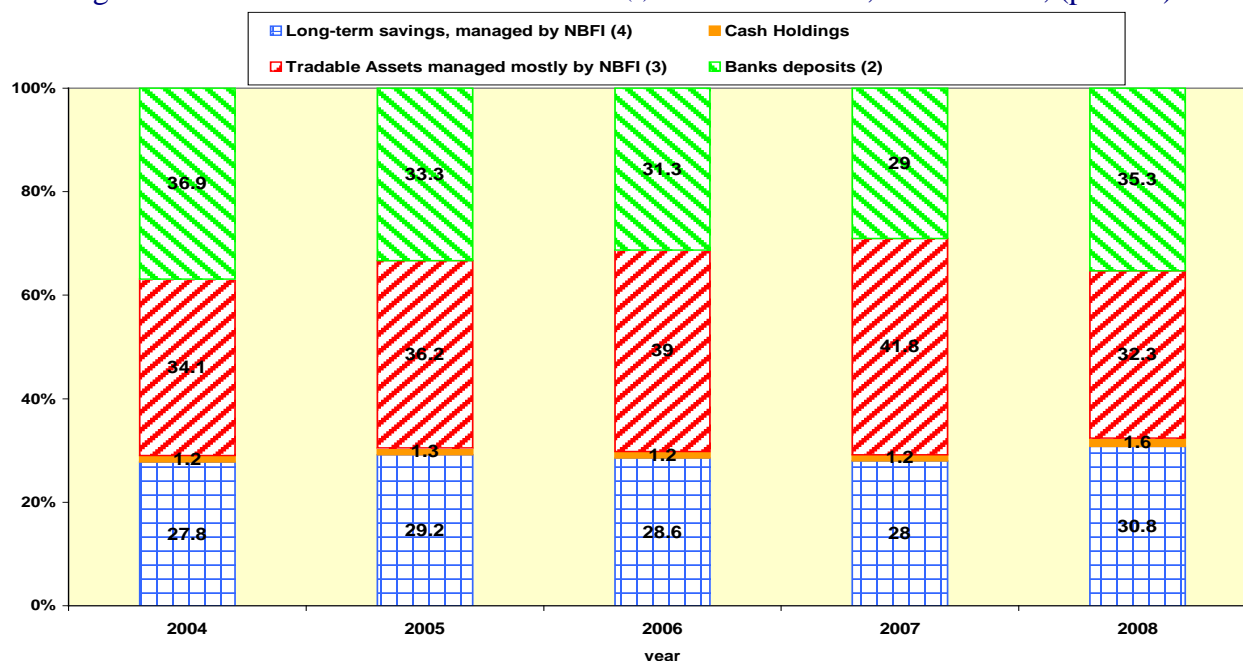
Several outstanding features of the growth of non-banks markets

The evolution of the public's assets-portfolio in those years is shown in figure 2.6. Two major changes occurred in the portfolio: the weight of public assets held in banks declined, and the weight of tradable assets (managed by NBFI) rose.

These changes reflect the Bachar reform's main action that transferred the public assets (long term savings) from the banks to NBFI. However it also reflects that a very large share of the public assets was diverted to capital markets (i.e. bonds and shares in Israel and abroad) under the management of NBFI.

These developments in the public portfolio contributed to its diversification and thus to a reduction in the associated risks. But it also exposed the public's savings to credit risks and markets risks (domestic and abroad). Moreover, as discussed in the next chapter, much of these investments in capital markets were in non-ranked bonds, in other words, NBFI risk management was inadequate.

Figure 2.6: The Distribution of the Public's (1) Assets-Portfolio, 2004 – 2008, (percent)



(1) Exclude the government, BoI and banking institutes.

(2) Commercial banks and mortgage banks.

(3) Include shares, tradable bonds and short term bill – private and governmental; and residents' investments abroad.

(4) Long term savings managed by NBFI (include provident funds and compensations, study funds, pension funds and life insurance)

Source: (BoI/BS, 2009, pp 27-29).

Debt oriented growth.

Most of the growth in funds raised outside the banks was extended from NBFI in bonds (rather than equity or loans), such that between 2004 and 2007, for every shekel raised in

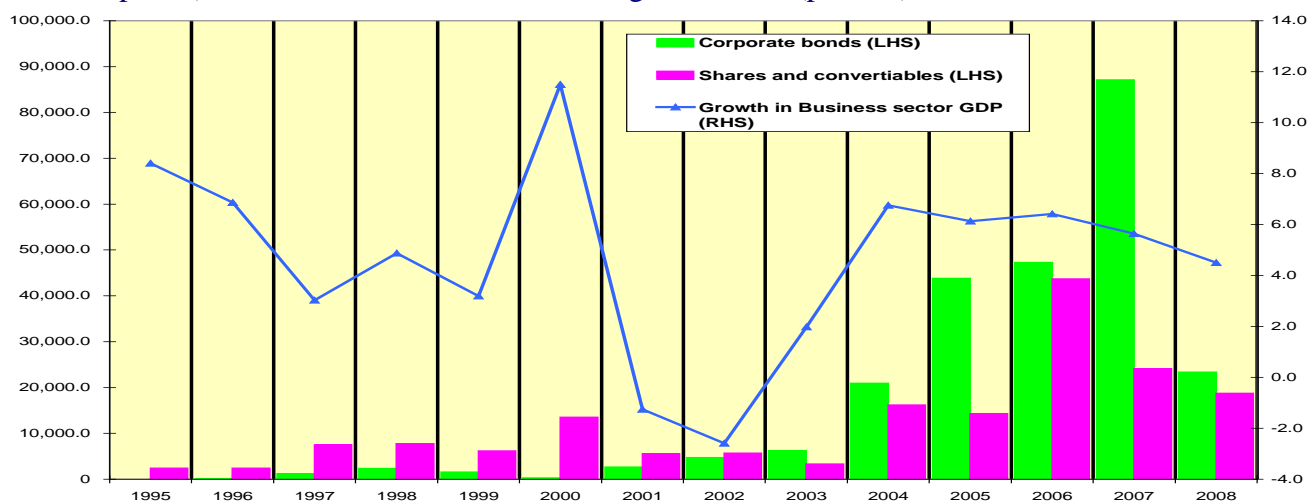
shares - 1.9 shekels were raised in bonds (see figure 2.7). The fact that bonds' raising grew faster than equity is also exhibited in the NBF's credit-portfolio: in 2004, shares and bonds each accounted for 18% of the portfolio, by 2007 shares accounted for 25% of the portfolio, whereas bonds accounted 36%.

This accelerated growth levels of the bond market resulted in high bonds-debt to GDP ratios, which grew from 9% in 2001 to 30% in 2007. This ratio was much higher than in other developed economies (in 2007): 20-25% in the US; 15% in Japan and 10% in Canada and in most of Europe. Moreover the growing debts of the business sector resulted in high leverage of 110%, the bulk of which was raised through bonds (since banks' credit declined in this period).

The implied redemptions of bonds in upcoming years amounts to NIS 6 billion in 2008 doubled to NIS 12 billion in 2009 and will rise up to NIS 60 billion in 2010⁴¹.

The implication of such high ratios is that during a slowdown in income (i.e. as GDP declines) the default risks will materialize and are expected to mature fast, thus adversely affecting the debtors (the firms), the creditors (the public) and the intermediators (NBF).

Figure 2.7: Fund Raising in the Stock Market, by type of security (NIS million, at current prices) and GDP of the Business sector growth rates (percent), 1995 - 2008



Source: (CBS/SAI, 2010, tables 17.8, 14.1 and 14.2)

The last feature of the growth of non-bank markets has to do with the **type of firms** that borrowed from these channels, through the bonds market.

⁴¹ Sources: (Hachmon, Zilberman and Arbel, 2009), (*The Marker: "The Bonds Market in Israel Grew Too Fast"*, Z.E. Eckstein, interview by Arlozorov M., November 3, 2009) and (*The Marker: "Contingency Plan for Resolving the Credit Crunch and the Liquidity Problems in the Capital Markets"*, article by Pertz Sami, October 19, 2008).

Zilberberg and Ruthenberg (2008) analyze the characteristics of three types of public firms⁴²: firms that issued 'high quality' bonds, i.e. yield-to-maturity was below the yield to maturity of BBB bonds; firms that issued 'low quality' bonds (above BBB) and firms that did not issued bonds i.e. relied only on bank credit (number of firms: 55, 17, and 76 respectively). They find that 'high quality' bonds were issued by the largest firms, valued as least risky and were the most profitable⁴³. The 'low quality' bonds were issued by firms that were the smallest, the riskiest and the least profitable. And the firms in between (i.e. medium-sized, with medium levels of risk and profits) were firms who didn't issue bonds⁴⁴.

They further find that among the different industries, firms within the construction and real-estate industry are most likely to issue bonds, with 36% of total issuance taken through the period. Other industries: service, maintenance and manufacture industries had issued 16%, 20% and 17% respectively; the rest (9%) was mainly issued by electronics and IT firms.

Their conclusions from these findings were:

1. The quality of banks' credit portfolio through the period was affected by two factors that worked in opposite directions: it was adversely affected from the growth in bonds' raising (since the 'best' firms turned to the bonds market for credit⁴⁵. And it was positively affected from a better diversification (lending to different borrowers and different industries) since the biggest costumers and specific industries (real-estate) turned to other funding sources, banks were able to extend credit to their other consumers. The total affect on the risk embodied of the banks' credit portfolio was nonetheless found to be **positive** (as discussed also at the beginning of this chapter).

⁴² Their sample included 159 non-financial public firms, which were included in banks' 'credit exposure reports' (i.e. these firms have been ranked for credit quality by banks).

⁴³ The risk level of firms was measured through five different indicators, two of which: 'credit ranking' (defined by the authors based on banks' ranking grades) and 'fluctuations in profits' were statistically significant at 5%. The other three indicators: the 'financial leverage', 'existence of doubtful debts' and 'finance coverage' (defined as the cost of finance- usually the interest rate - divided by total income) were insignificant at 10%. Firms' profitability was measure by four ratios, one of which - the 'return to assets' (ROA) ratio -was statistically significant. The other three: 'return to sales' ratio, liquidity ratio, and 'firms capital multiplier' (defined as market value divided by book value), were found to be statistically insignificant at the 10%.

⁴⁴ This empirical finding was justified theoretically due to monitoring and moral hazard considerations: Firms have two alternatives for fund raising: issue bonds or attain bank credit. The latter is more expensive – thus less profitable, but it is also monitored and thus reduces a firm's possibility to take risky projects (which in particular reduces the firm's insolvency risks). The paper assumes firms' credit ranking declines if they become insolvent. They find that firms with a high credit rank will benefit more from issuing bonds (rather than staying at the bank) since their high rank will be a good enough incentive to avoid risky projects. Similarly but for other reason will decide low-quality firms, in this case their rank is too low to act as incentive to stay with the bank/monitored option - compare to the gain from cheaper borrowing in the non-banks channel). The medium-ranked firms will benefit mostly from staying in the bank since their rank is too low to disincentive them from taking risky projects (if they went to bonds market i.e. were not monitored) but it is high enough to benefit from banks' monitoring (that keeps that from insolvencies).

⁴⁵ Although there have been low-quality firms which issued bonds, their weight was smaller than the high quality firms that issued bonds (17 compared to 55 firms), thus the dominant effect was from the leaving of the 'high-quality' firms.

2. Predictions for recessions: the authors predicted that during recessions, only the best performing firms will continue to attain funds through bonds issuance, whereas the rest – 'medium' and 'low' firms - will turn to banks.

2.2.3. Small and Medium size Entities⁴⁶ (SME)

Some numbers (for 2007): SME in Israel accounts for 99.3% (about 400,000) of total businesses; it employs 55% of the working force sector (compare to two thirds in developed countries)⁴⁷. The SME's production accounts for 40% of the total production in the business sector. These production levels are quite low given the sector's share of the working force (55%). This reflects the high centralization levels of the Israeli market i.e. that production activity is centralized in big firms, and underutilization of the SME sector (i.e. that producing levels in the sector are lower than their full potential).

Opening a SME in Israel in 2007 means there is a 40% chance to close it in the first two years and up to 80% chance to close within 5 years - compared to 50% in the general market (i.e. including all sized firms). These ratios are relatively high in the international scale, for example in Finland closing rates in the first two years are 29% and in Sweden rates are only 12%.

Around 75% of SME are within the trade and services industry; 10% are in the construction and infrastructure industries and the rest are in tourism, agriculture and manufacturing.

SME are typically more sensitive to macroeconomic fluctuations either because, for example, they are the marginal producers in the industry or because their size enables them to be more flexible to changes, thus react to shocks faster than large businesses. Since the number of businesses in this sector is large and since these businesses are widely spread this sector has a large effect on employment. These qualities of SME' flexibility are what make this sector so important for economic growth (KRIC, January 2007, pp 2-3).

The SME sector is 'known' for having fund limitations as documented in much empirical literature. In Israel the fund limitations of SME are reflected in the banking system as well as the non-bank sector. In the banking system SME account for 5% of total credit to the business sector. Moreover, findings suggests that banks were systematically discriminating SME, by

⁴⁶ The non-formal definition of small to medium sized business in Israel is a business that 90% or more of its ownership is private; has up to \$20 million in its yearly sales; and employs up to 100 workers.

⁴⁷ Sources: (CBS/SAI, April 2010, tables 18.3 and 12.20); and (Knesset Research and Information Center [KRIC]: "SME in Israel and in Developed Countries", January 2007)

raising their price of credit and their collateral requirements compared to large businesses, so that the chances that any asset (fixed, deposits, securities and such) will serve as collateral is smaller for SME than for larger businesses⁴⁸. Banks' discrimination of SME reflects the perceived creditworthiness of this sector, i.e. that SME are risky and their economic benefit from lending to them is low. This perception was tested empirically in Israel and was proven to be incorrect: SME which were extended credit tended to have growth rates that were higher than the average market rate (Tavor and Sorani, 2007, pp 9-14).

SME also have limited access to banks' substitutes, i.e. to non-bank markets. Whether it is because of the high costs of credit in these markets e.g. of publishing prospectus (as described also in chart 1.1.) or because of the high thresholds needed in capital markets (i.e. meeting the minimum capital requirements for issuing tradable securities). The discussion in the previous subsection may suggest that small firms have had higher costs of issuing bonds than large firms, as it was mostly small firms that issued low-ranked bonds – defined as bonds with high yield-to-maturity (i.e. price). Since these findings applied for firms that were small and least profitable and riskiest, it is not meant to say that only size mattered for the price of bonds; however if the last two features correlate with a firm's size, it might still suggest that small firms paid more.

This last point in particular suggests that banks' attitude toward SME is particularly crucial in Israel where the market is centralized and the banks' market power is high (since it means higher costs of credit with no substitutes).

Overall, it seems that SME funding limitation did not improve in the last few years i.e. since the execution of the reforms discussed above. This is indicated from companies surveys, (BoI: The Companies Surveys: 2009 4th quarter [BoI/CS], 2010, pp 7 – 19) which shows that since 2005, the funding limitation of large firms had declined continuously, whereas for medium firms it declined moderately and only as of 2006, for small firms these limitations did not improve (and during 2005 it rose, see figure 3.3B). SME' funding limitation are also indicated from the 'Gini' index for the centralization level of banks' credit, by borrower size, which only

⁴⁸ the discriminations of banks toward SME is indicated from systematic differences in the percent of assts (value or price) that can serve as collateral, for example: 'liquid deposits' for large firms 98%-100% serve as collateral, whereas for SME it is between 90% and 95% - up to 10% discrimination in liquid assets!, the discrimination is indicated from other assets: securities - up to 60% discrimination; fixed assets – up to 50%; cash flow – up to 40% discrimination (SME can hardly attain credit based on their business activities, whereas large firms can use their cash flow for 40% of collateral. (Tavor and Sorani, 2007, pg 6-8)

declined slightly in 2005 but rose back in 2006 and 2007⁴⁹. This in turn reflects a failure of the structural reforms, in attaining credit growth to the market as a whole.

This last discussion motivates categorizing SME as 'low-quality' borrowers in Israel.

Moreover, the attitude toward SME in 'good times' (i.e. 2003-2007) may reflect on what will be the attitude when times are bad. In other words, this discussion embodies a rationale for 'Flight to Quality' of banks from SME during the global financial crisis.

Chapter 3 shows that such discrimination did occur, and it was motivated by the shutdown of non-banks financial sources.

3. The Global Financial Crisis and Israel.

The following chapter presents and discusses empirical findings on the affect of the global financial crisis on the Israeli market. This will be done in the 'spirit' of the Financial Accelerator theory. Specifically, trying to answer the three questions presented in the introduction (1) what were the effects of the global shocks on non-bank markets, and in comparison to their effects on the banking system? (2) What were the effects of the global shock on real activity? And: (3) were there indications for Flight to Quality?

This chapter is organized as follows: start with a description of the initiation of the crisis in the Israeli market (subsection 3.1). Then, continuing with describing the effects of the crisis on real activity (subsection 3.2). Next subsection 3.3 describes the effects of the crisis on the credit markets, including business-borrowers' funding limitation (3.3.1) and the turmoil in non bank markets and (3.3.2). Finally subsection 3.4 will present indicators for Flight to Quality (i.e. of lenders from business burrowers).

⁴⁹ The Gini index for the centralization level of banks' credit, by borrower size was measured on the five banks groups, (higher value of the index means higher centralization of credit extended to large borrowers): the index was at 0.891 in 2004, it declined to 0.864 in 2005 but rose back again in 2006 (0.891) and stayed in this level in 2007. The index for 2008 declined to 0.879, indicating a lower centralization level, but it was mostly due to a rise in the credit extended to private people, i.e. households and private banks.
Source: (BoI/BS, 2009, pp 115-118).

3.1 The initiation of the Crisis⁵⁰.

The Global Financial Crisis of 2007 - 2009 has been (and for some countries still is) the worst economic crisis since 1930's. It initiated in July 2007 from the Sub-prime Crisis in the US, which had infected economies around the world. In September 2008 the crisis got worsened with the collapse of the 'Lehman Brothers' investment bank. This subsection focuses on the initiation of the crisis in *Israel*.

The first global shocks that hit the Israeli market were the declines in asset values of both financial and real assets abroad. The initial decline of financial assets abroad had a 'domino effect' on local capital markets, due to high correlation between such markets, thus throughout 2008 the Tel-Aviv Stock Exchange fell by more than 40%. These developments had resulted in increasing losses for sectors that were exposed to such assets - the financial services industry (including banks and NBFi) and the Real-estate & Construction industry (REC). The losses of the financial services industry were due to high exposure to financial markets domestic and abroad (i.e. via investments in capital markets and loans to foreign banks), and in particular, to toxic financial assets (i.e. MBA). The bulk of these losses were absorbed by the NBFi (see also subsection 3.3.2). The REC industry was hit due to high extent of investments in real-estate abroad, mostly within the US and east Europe (see also subsection 3.4.2).

Throughout 2008, as the Global Crisis got worsened the global trade declined, thus there was a slowdown in domestic real activity: GDP growth stopped (see figure 3.1.) and the country's 'state of the economy' index declined, expressing the contraction in activities such as production, employment, imports and exports (see figures 3.1, 2.1, and chart 2.1). The extent of these contractions was triggered from Israel's high level of openness, as discussed in chapter 2.

The contraction in real activity led to a rise in the public debt and in the government deficit due to their implied cut backs in taxes (see figure 2.2).

In particular, the developments throughout 2008 led to deterioration in the net-worth of economic agents – of lenders, (business) borrowers and financial institutes. The extent of which varied across these sectors (as will be discussed in subsections 3.2 and 3.3). This in turn led to withdrawals of public savings (mostly from NBFi), to sharp declines in securities' market value and to deterioration in the credit-quality (of banks' credit as well as bonds). Thus

⁵⁰ The sources for this subsection were: (The 17th Annual Caesar Forum, July 2009, pp 8-21); (BoI/BS, 2009, pp 153-156); (KRIC: "The implication of the Global Financial Crisis on the Credit market in Israel", September 2008, pp 1-3); and (IMF/IS, 2010 pp 15-16).

there was a decline in the access to credit (mostly of NBFIs) and a rise in its costs (both by the banks and by non bank lenders, see figures 3.11 and 3.7 respectively).

3.2. The Financial Accelerator: findings and reasoning

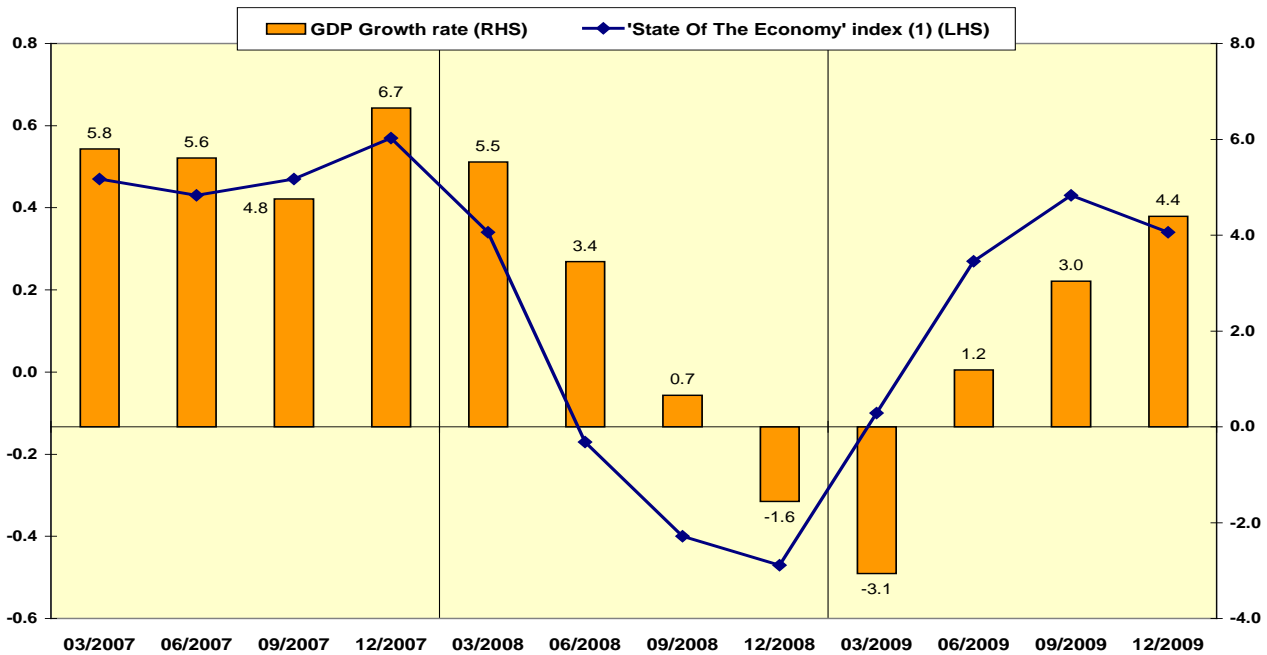
The main theoretical implication of a 'Financial Accelerator' scenario is its excess effect on production (output): in the case of an adverse shock, the contraction in activity will start earlier, last longer and will be in higher numbers - compared to when the Financial Accelerator mechanism is absent (the 'baseline case'). Again, this is because when credit market frictions are present, the deterioration in agents' financial health adversely affects the accessibility of credit: its price will rise, and its supply will decline. This then forces further contractions in agents' activities – borrowing and production. Thus the effects of the shock on real activity will be propagated and amplified.

3.2.1. The effect of the global shocks on real activity

Findings on the effects of the global shocks on real activity, between 2007 to 2009 show that the implied excess decline in GDP **did not happen** in Israel: the contraction in GDP has been modest and the persistence of which was short: GDP growth had stopped (became negative) for merely two quarters – as of the last quarter of 2008, and it has been growing since the second quarter of 2009 (see figure 3.1). Accordingly in 2009, GDP growth was **positive** with a rate of 0.7% – in contrast with the initial negative predictions given by the BoI and by the IMF (of -1.5% and – 1.7% respectively). These predictions have been updated upward throughout 2009, to 0% by BoI (on September) and to - 0.1% by the IMF (on October). Moreover, the predictions for 2010 have also grown from 0.1% to 3.5% by the BoI, and from 0.3% to 3.2% by the IMF. (BoI data, 2010); and (IMF: World Economic Outlook [WEO], April 2009, October 2009 and April 2010).

The recovery in the market was also exhibited in other areas such as employment, import, and export - as indicated from the rise in the 'state of the economy' index since the trough of the last quarter of 2008. Although the recovery in 2009 was not complete and activity has not yet returned to its pre-crisis levels, these steady improvements in real activity indicate that the trough of the crisis had passed and its implied damages are being healed.

Figure 3.1: GDP-Growth (2) and The 'State of the Economy' index (1), 2007-2009.



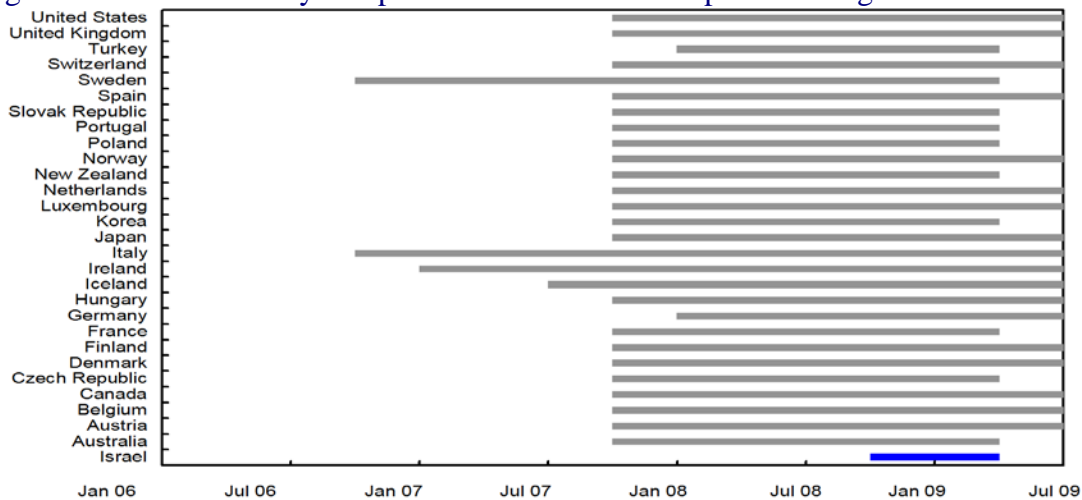
(1) The 'State of the Economy' index is synthetic cyclical indicator for real economic activity. It is calculated from the monthly changes in seven components including: production, imports, exports, trade and services revenue; the number of employee posts in the business sector. For a fuller explanation of the index see BoI's website: ([link: http://www.bankisrael.gov.il/deptdata/mehkar/indeng.htm](http://www.bankisrael.gov.il/deptdata/mehkar/indeng.htm)).

(2) The percent change of GDP (constant prices, seasonally adjusted): current quarter compare to its former.

Source: BoI data, February 2010.

This view is further supported in a cross-country comparison on the evolution of real GDP throughout the crisis ('from peak to trough'), which indicates that the decline of GDP growth rates was the mildest and the shortest – last to fall below trend and one of the first to stage a recovery – relative to other developed countries (see figure 3.2.). In other words: "Israel has had a good 'great recession' [...] This is a passage through the Great Recession that many would envy" (IMF/IS, 2010, pp 11)

Figure 3.2: Cross-Country comparison: Real GDP 'from peak to trough'



Source: the figure is copied from IMF/IS, 2010, pp 34, figure 4.

In particular, these findings suggest that a financial accelerator mechanism has not been fully active in Israel. The next subsection discusses the reasons for that.

3.2.2. Reasoning: "Why was output in Israel so resilient through the global crisis?"⁵¹

The resilience of the Israeli market throughout the global financial crisis was attributed to several factors, including:

1. Strong policy reactions aimed to prevent the financial distress and renew growth, these include monetary expansionary actions including sharp reduction of the monetary rate and purchases of government bonds - aimed to stimulate consumption and investment in private securities (i.e. reduce the price of capital and raise the price of government bonds thus discourage investments in government bonds and bank deposits). In addition, BoI had purchased US\$ as of March 2008 (in order to prevent the currency appreciation thus to help exporting). Fiscal expansion was activated as of January 2009, which included reduction of income and corporate taxes, raising the government expenditures and activating a two-year fiscal budget to cope with the market's uncertainty on future fiscal operations (and thus encourage real activities). And a rescue plan was executed in January 2009. The plan included a 'pension protection program aimed to reduce the public's losses and uncertainty from the crisis. And a 'capital market program' aimed to help the recovery of the financial sector (that was draining due to the turmoil in the capital markets, see subsection 3.3), these included: establishing investment funds to aid the bonds market (which enabled refinancing of solvent firms); establishing a procedure for bond rescheduling; credit guarantees for SME and capital guarantees for the banking system⁵².

The policy actions were published and explained in the media, which helped in the transmission of these stabilization actions. In particular, the execution of these actions benefited from the credible reputation the authorities had attained before the crisis (as discussed in 2.1). These policy actions were appraised in IMF/IS (2010, pp 12) to be with appropriate extent and timing.

2. Market's features. The crisis had affected economies around the world with a contraction in real activities, mostly noted: a decline in GDP, external trade, employment and fixed

⁵¹ This subsection is based on (IMF/IS, 2010, pp 47-59) the head line is quoted from pp 47 in the report. .

⁵² For a full description of the policy actions taken see (IMF/IS, 2010, pp 11-14 and pp 75 onwards).

investments. However these effects have been buffered thanks to several key features in the Israeli economy such as high saving rate of the public, which helped to smooth consumption. There were no 'bubble prices' in the housing market before the crisis. Thus the sharp fall of asset prices seen in other economies was avoided in Israel. In fact asset prices had grown throughout 2008-2009, which contributed to agents' financial position at that time. Another feature that helped the economy was that a high share of investment-goods and consumer-durables are imported in Israel. Thus the heavy losses experienced by these markets (due to a reduction in the demand for them) did not affect the Israeli exporting sector.

The market's initial features implied that Israel's level of exposure to the global shock was low relative to other economies. Moreover, much of these features were found to act as buffers to the effect of the global financial shock on domestic GDP (i.e. having these feature have been associated with a lessened effect on GDP due to the crisis shocks⁵³).

3. Resilient banking system⁵⁴. Although the crisis led to a rise in banks' exposure to risks, in particular credit risks, the banking system kept resilience, and was in good condition throughout the crisis, especially when compared to banking system in other countries: none of the Israeli banks went bankrupted, or were nationalized or rescued by the government. The banks' good performance through the crisis was a result of high regulation, traditional lending activities and low exposure to toxic assets. All of which helped buffering the adverse effects of the crisis. Specifically, a closer look in the different financial risks banks were subject to shows how these features helped the system: banks' credit risks grew through the period, due to a rise in the extent of credit, and to a deterioration in the credit quality (as indicated from a sharp rise in banks expenses for doubtful debts and from a rise in banks' 'problematic loans', see chart A.2). However banks reserves for credit risks grew in the years before the crisis (i.e. the growth of banks' capital adequacy as discussed in chapter 2), which buffered the realization of those risks. Moreover the extent of bad debts stayed relatively low and the centralization risks (which also affect the credit risk) had declined in 2008.

⁵³ In IMFIS (pp 56-59) the authors build an index for 'a country's level of exposure to the crisis shocks'. The index is based on a country's distribution to different sectors, and was defined as a weighted average of each sector's shock, with the weights being the share of the sector- its gross value added in a country's GDP – relative to the global average share. They ran a regression analyses which shows that (1) a low level of exposure to the crisis shock is correlated with a lower fall in GDP. (2) Features such as housing boom and decline in external trade were found as contributing to a decline in output; and (3) a country with large high-tech sector (i.e. high gross value-added to GDP), the effect of a decline in external trade on output is minimal. Thus these results indicate that Israel's exposure to the shocks was one of the lowest in a cross country comparison. Moreover the decline in external trade was buffered since Israel's high-tech sector accounts for a high share of GDP.

⁵⁴ Sources: (IMF/IS, 2010) and (BoI/BS, 2009)

The banks' 'risks from abroad' – i.e. that stems from banks' holding of foreign financial assets (equity, bonds and loans owned by Israeli banks) - were realized in 2008, thus adversely affected the quality of banks' securities-portfolio and credit-portfolio. But since the level of exposure was low and relatively safe⁵⁵, it merely resulted in a decline in profitability (with only one bank – Hapoalim - had real net losses in its securities-portfolio). In this relation, the banks' supervision authority played a key role as banks were instructed to sell their toxic holdings already in 2007 – at the beginning of the crisis in US.

Banks' liquidity risks remained low through the crisis since banks' funds sources are based mainly on deposits, rather than wholesale funds - bonds and equity - which lost value through the period.

The strong regulation and banks' cautious lending may have contributed to the absence of bubble prices in the housing sector mentioned above, since "sub-prime" lending was not feasible and banks' exposure to borrowers as well as specific sectors was limited (as discussed in subsection 2.2.1).

4. The structural reforms that were executed before the crisis contributed to the market's resilience since perfecting the financial markets had benefited to the diversification levels of the public's assets-portfolio and the banks' credit-portfolio. Of particular interest is the Bachar reform, through its main action of moving banks' control of provident funds, this reform minimized much of the risks banks were subject to otherwise, such as centralization risks, credit risks (since the growth of banks substitutes contributed to the quality of banks' credit portfolio), and to market risks (since banks were no longer holding of provident funds, banks' exposure to capital markets – domestic and abroad- declined). In other words, the Bachar reform helped isolating the banks from the global financial shocks.

Last but no least:

5. Timing. The crisis 'caught' the Israeli market in its 'best state ever': after five years of economic growth (that nonetheless avoided 'bubble prices') and after the executions of the structural reforms, both of which strengthen the economy and cushioned the adverse effects of the global crisis.

In particular, in 'Financial Accelerator' terminology i.e. the 'Non-Linearity of the Cycle' inference, suggest here that the economic boom and strong fundamentals acted as buffers to plausible financial accelerator effects. Because, as explained in 1.2, economic booms positively affect agents' financial health, which imply that the conflict of interests between

⁵⁵ 95% of the banks' credit extension to foreign factors was to 'investment ranked' financial institutes, i.e. BBB to AAA and banks' holdings of toxic assets were minimal.

lenders and borrowers is lessened. And thus the mechanism of the financial accelerator will be muted.

Although the Israeli market managed the crisis relatively well and the recession lasted only for a short period, it was not unscarred. As mentioned at the beginning of this chapter, Israel was adversely affected from the contraction of global trade, and from the decline in the value of real and financial assets. These led to a contraction in real activity, including production, employment, and demand for domestic goods and services.

In particular interest (for this paper) are the adverse developments within the credit markets, this is the objective of the following subsection.

3.3 The Effects of the Global shocks on the Credit Markets

The effects of the crisis on the credit markets varied across sectors: as discussed above, banks kept resilience through the crisis; however business borrowers were experiencing funding limitation and in the non-banks markets, all financial activities – lending, borrowing and refinancing – declined sharply throughout 2008. These adverse developments are described in the following two subsections.

3.3.1: The Demand Side of the Financial Sector (Business Borrowers)

Companies' Surveys: as an exposition, figures 3.3 below presents firms' limitations in executing economic activities throughout the crisis, as evident in surveys taken in the last quarter of 2009 (BoI/CS, 2010, pp 7-19).

In these surveys firms were asked to rank the severity of three types of limitation – demand limitation, supply limitation and funding limitation – in interfering to their economic activities⁵⁶. The ranks were between '0' = 'no limitation' to '4' = 'very severe limitation'. The figures show the average results according to industry (3.3A) and according to firms' size (3.3B).

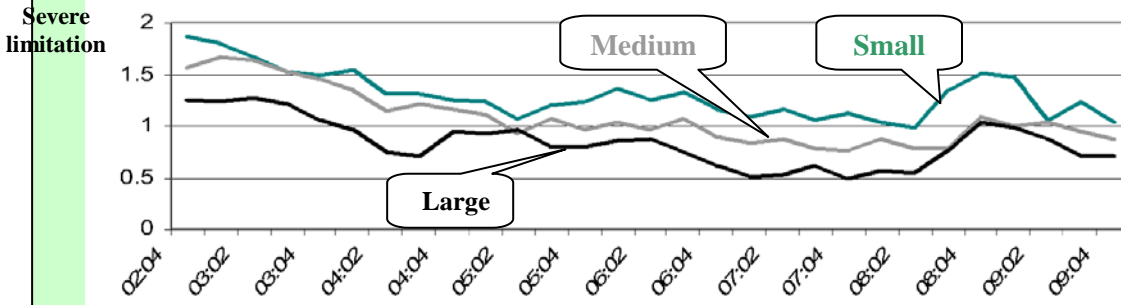
⁵⁶ The '**Demand Limitations**' includes: foreign orders; domestic orders; the financial situation and the security situation in Israel; the financial situation abroad; and increase in the competition. The '**Supply Limitations**' included: lack of equipment and machinery; and lack of skilled workers.

Figure 3.3: The Companies Surveys.

3.3A. The severity of various limitations to the execution of economic activity, by industry, from 2007 Q3 to 2009 Q4. (1)



3.3B. The Severity of the Funding limitation by business's size, 2002 – 2009



(1) The answers run from 0 to 4, so that: 0=no limitation; 1=slight; 2=moderate; 3=severe and 4=very severe limitation.

The survey included 600-700 firms (amount changes along the report due to changes in the number of firms answered for each type of questions); from which 243 were large firms, 184 medium and 128 small firms

Source: ([BoI/CS], 2010, pp 7- 19). Figure 3.7B was copied from pp 7 (figure 9b)

Three conclusions stem from these surveys⁵⁷: First, the Funding limitation accounted as the most severe limitation to the flow of economic activity – more than the demand limitation and from supply limitations. This is the case for all industries, but for the real-estate and construction industry; in this industry it was mostly the demand which held back the activity until the end of 2008; since the first quarter of 2009 the funding limitation became the worst limitation, but evidently it a result of a decline in the severity of the demand limitation, rather than a rise in the severity of the funding limitation, (see figure 3.3B).

The second conclusion that stems from these surveys is that the funding limitation 'peaked' between the end of 2008 and the start of 2009 - which was also the peak of the crisis in the market (and in non-bank markets, as discussed in the next subsection). This limitation had declined as of the second quarter of 2009 in all industries - but the transportation and communication industry (there the severity fluctuated throughout 2009: 1.2, 1, 1.1 in Q2 to Q4 respectively).

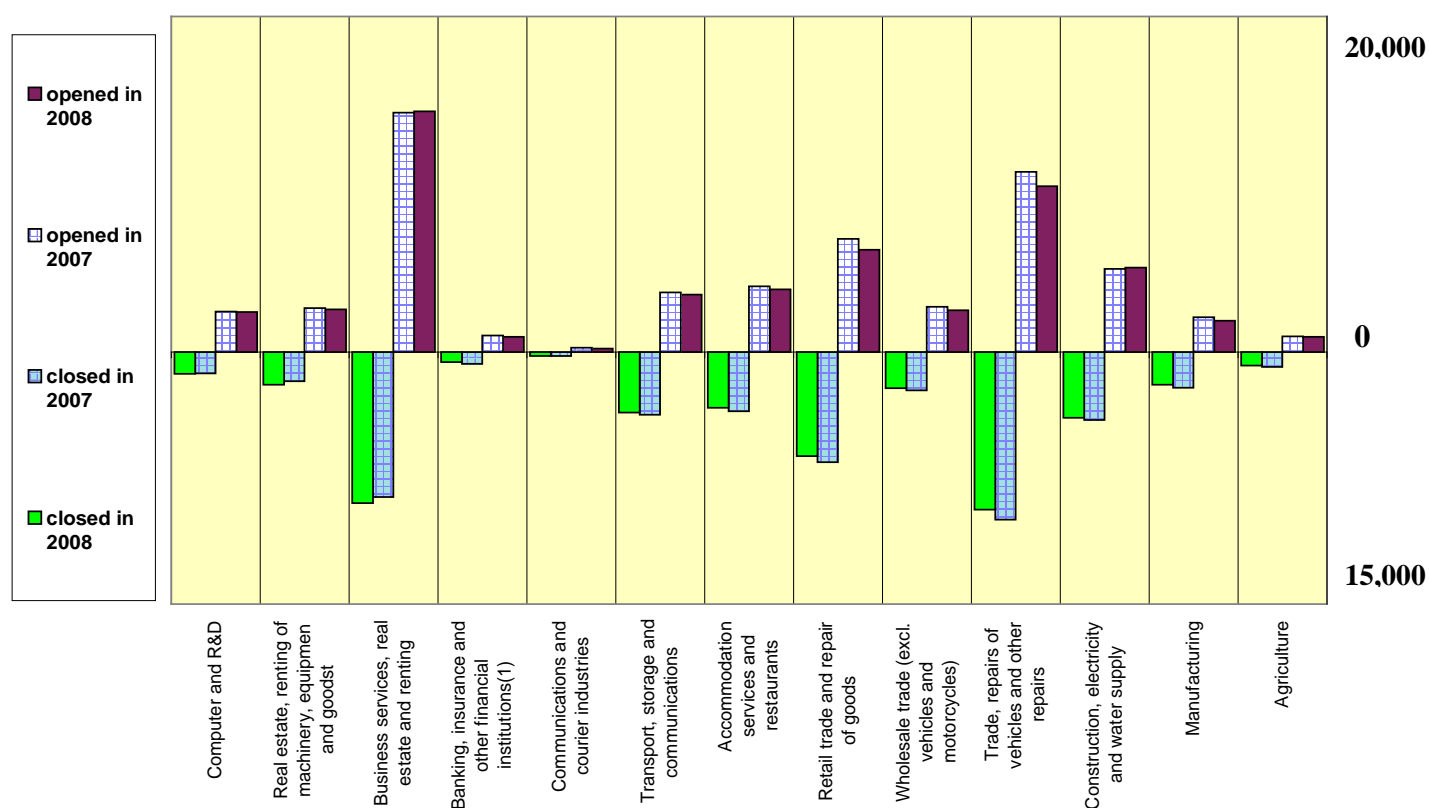
Lastly, these surveys show that all firms – small medium and large - reported higher funding limitation as of the second half of 2008 so that large and medium firms had reported similar severity of limitations (i.e. sharp growth for large firms) and for small firms this limitation was evidently the highest. As of the second half of 2009 the severity of this limitation has continuously declined for large firms and medium sized firms; for small firms the severity has been growing (see figure 3.3B).

'Out of business': The next indicator from the demand side reports the number of businesses opened and closed in 2007 and in 2008 (figure 3.4). The data shows that in total, during 2008 the amount of businesses opened was lower than in 2007 (47,819 compare to 48,812). This was the case for all business sectors as the figure shows. In addition, the data shows that fewer businesses were closed in 2008 than in 2007 (37,144 compare to 38,086 in 2007). This was the case within several business sectors (e.g. retail trade and manufacturing) whereas in other sectors it was not i.e. more businesses were closed in 2008 than in 2007 (e.g. Business Services and the Real-estate and construction industries).

These findings, that fewer businesses were closed throughout 2008 compared to 2007- in spite of the crisis, is most probably the result of the common lag between GDP and employment (the data for 2009 was not available at the time this paper was written).

⁵⁷ See also (BoI/CS, 2010)

Figure 3.4: The Number of businesses opened and closed in 2007 Vs 2008, by fields (1)



(1) The data was published according to fields of activities - rather than industries. Here I presented selected fields. A full chart is found in (CBS/SAI, 2009, chart 18/4. Link: <http://www.cbs.gov.il/reader>)

Insolvencies in numbers: by September 2009, 45 firms that issued 80 series of bonds had entered arrangements of creditors – worth NIS 14 billion. The market value of these debts is about NIS 5 billion – the difference (NIS 9 billion) expresses the losses to the public thus far. The bulk of the firms that entered arrangements in 2009 were non-ranked firms (78%) or firms from the real-estate and construction industry (45%). Moreover, in 2010, redemption of debts is evaluated to be NIS 25 billion, (twice the amount in 2009) from which about 10% are predicted to enter arrangements of creditors⁵⁸.

⁵⁸ Source: ISA data as published in a newspaper article (*'The Globes'*: "Arrangements of Creditors: 9 billion have already evaporated", Levi A. and Avishar I., September 18, 2009).

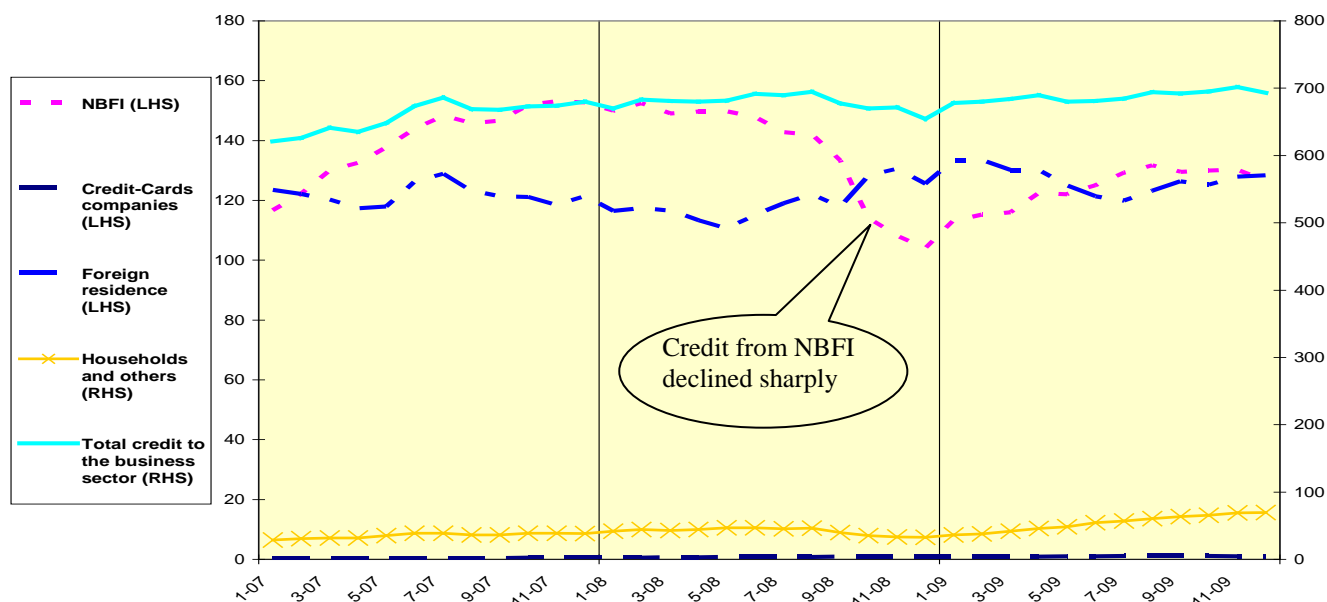
3.3.2. The turmoil in non-banks markets

The 'turmoil' in non-banks was the worst effect the Israeli market had experienced through the global crisis (see e.g. IMF/IS (2010); BoI/BS (2009)). It had evolved throughout 2008 and peaked in September – October that year, with the collapse of the Lehman Brothers investment bank. At the heart of this turmoil were the bonds market⁵⁹ and the NBFBI sector. Indeed, throughout 2008 there have been sharp declines in bond issuances, the extent of bonds' insolvencies rose and there was a contraction in the scope of funds intermediated by NBFBI (i.e. their credit extensions declined and savings withdrawals rose). Moreover, through this year the spread rates on bonds in the primary markets rose in all ranking classes (i.e. the yield-to-maturity demanded from bonds issuers) and there were declines of bonds indexes in the secondary market (i.e. the market value of existing bonds, see figure 3.7).

The recovery in these markets began as of the first quarter of 2009 (see figures 3.5, 3.6 and 3.7)

It should be noted that this adverse episode in the Israeli financial sector was different from other economies, as it sourced within non-bank markets, rather than the banking system (as occurred in e.g. Iceland, Ireland and the US).

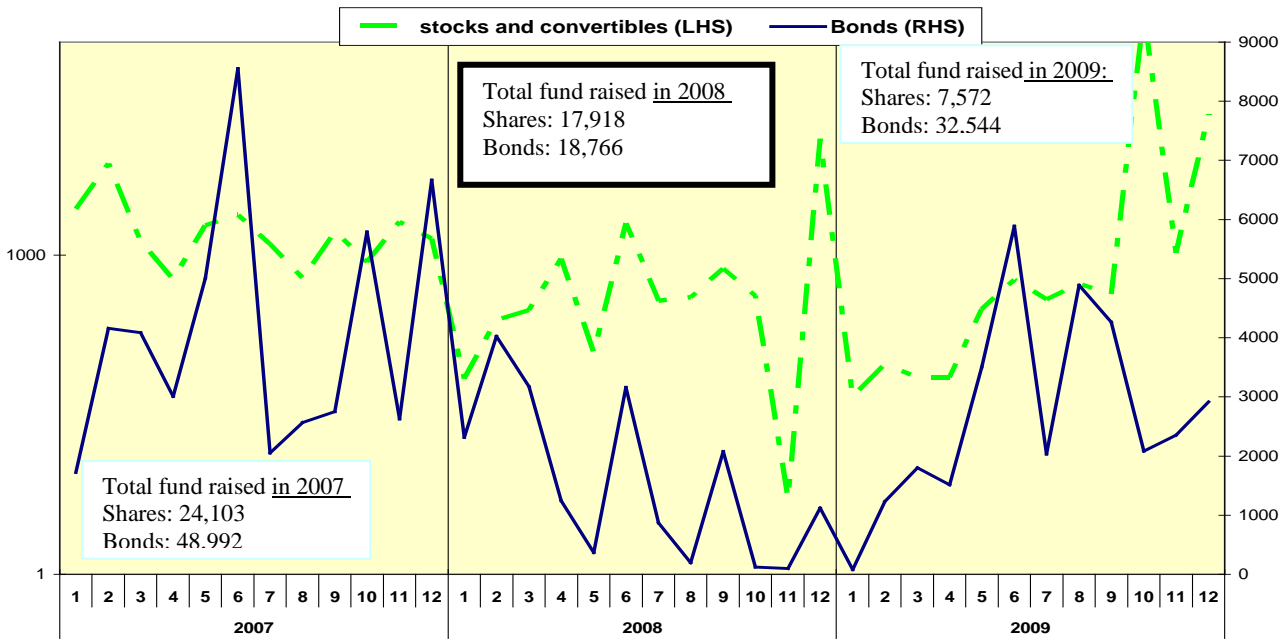
Figure 3.5: Credit extensions from Non-Banks sources, 2007 – 2009.



Source: BoI Data, table 2.

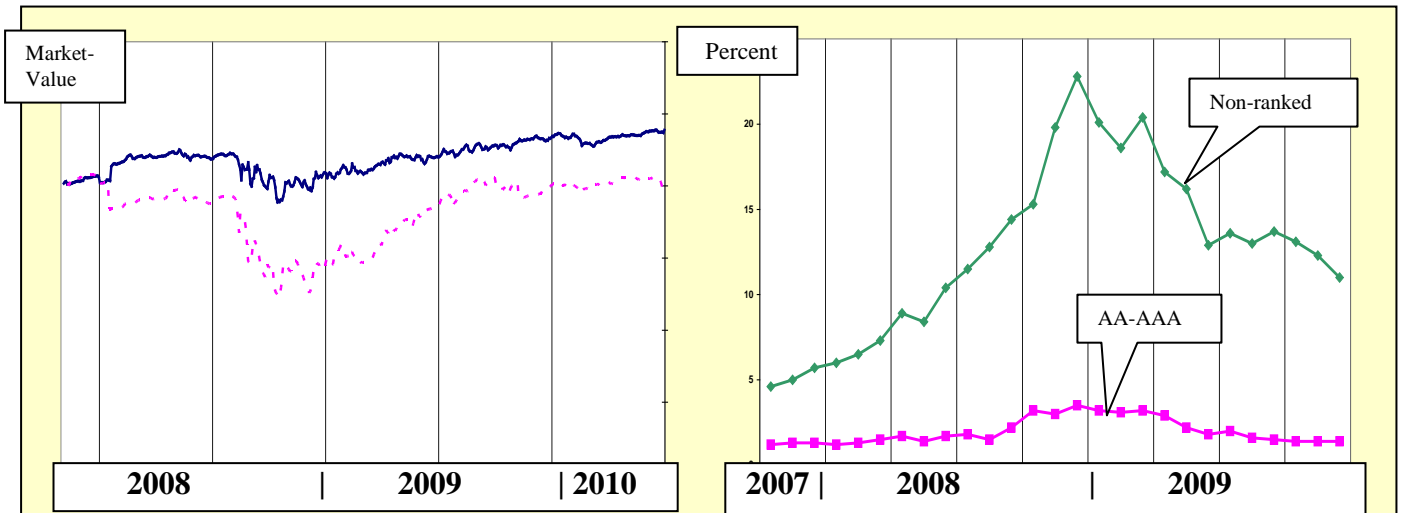
⁵⁹ In the spirit of other reports on the crisis in Israel, this paper does not focus on the declines in the stock markets since they were similar to declines in other economies and were more a result of the global shocks (due to correlation of shares indexes). In addition, the heart of the crisis was within the bonds market in Israel.

Figure 3.6: Fund Raising from the Bourse, shares & convertible (1) and bonds 2007- 2009 (NIS million, current prices).



(1) Data include issues and private allocations – domestic and abroad; convertible bonds (that are not registered on the stocks exchange); exclude realization of warrants by subsidiary companies.
 (2) Exclude private issuances and allocation for subsidiary.
 Source: Tel-Aviv Stock Exchange [TASE], January 2010

Figure 3.7: The cost of non-bank credit: the Market Value of Existing Bonds(1), 2008 – 2010 (3.7A) & The Cost of new Bonds(2), October 2007-2009 (3.7B)



3.7A. Tel-bond20 & Tel-bond40 (broken line), 2008-2010

(1) The Tel-bond 20 (40) index measure the market value of the 20 (40) bonds with the highest value (in NIS billion)

Source: TASE data, March 2010.

3.7B. The Spread rates, by rank, 2007-2009

(2) The spread rate were measured by the wedge between the average yield on private bonds (exclude the real-estate industry; CPI indexed, with above one year duration) and government bonds "Galil"(of 7-20 years duration).

Source: BoI: The Inflation Reports [BoI/IR] (quarterly publications) data was taken from a sequence of the BoI/IR reports - starting from 2007:3rd quarter, until 2009:4th quarter.

The chain of events that led to the turmoil in the capital markets involved all the players in these markets - the lenders (the public), the intermediators (NBFI), and the borrowers (businesses):

Borrowers: The decline in profitability (due to downward in the demand for domestic goods) and the decline in assets value led to a decline in firms' net worth, and in particular to a liquidity limitation. This immediately affected firms' ability to carry payments of existing debts and increased the risk for insolvencies. Thus the market value of existing debts declined and the yield-to-maturity demanded for new debts rose. The rise in the yields were affected by firms' perceived creditworthiness such that high ranked firms (AA-AAA) had a smaller effect than lower-ranked firms (A and below, see figure 3.7B).

The rise of spread rates in turn led to stagflation in the primary market, where bond issuances declined through the year until in the last quarter it stopped completely, since with such high spreads it was not worthwhile to raise new funds. Recycling old debts in that market was thus impossible. The stagflation in the primary market signaled economic distress which led to further declines in the bonds indexes.

The investors (lenders) experienced growing losses on their investments throughout 2008 and at the peak of the crisis the public's assets portfolio lost up to 11.2% within two months (from September to November 2008). Thus, investors, encouraged by the deepening of the crisis, withdrew their savings from NBFI throughout 2008, and diverted these funds to less risky channels – bank-deposits or portfolios with low exposure to the capital market. The extent of the withdrawals at the peak of the crisis had a daily average of NIS 170-190 million (Y.A Antabi, The Commissioner on the Capital Markets, personal communication, December 29, 2008). Savings' withdrawals were mostly from provident funds and study trusts, since these were highly invested in bonds and shares.

NBFI (the intermediators), in order to meet these vast withdrawals, had to sell their financial holdings and limit their credit supply (figure 3.5). NBFI's need for liquidity had created risks of **moral hazards** since assets (and portfolios) were evaluated at that time on the basis of their level of liquidity (i.e. liquid assets such as short-term debts were perceived as being most worthy), thus investment- managers had an incentive to materialize assets based on their maturity - even if these assets were not affected from the crisis, e.g. had a low exposure to toxic assets. This feedback resulted in further cash-ins of savings (of bonds before their redemption date).

The cash-ins of securities by NBFIs in turn led to a flooding in the supply of securities in the market, thus to further reductions in their market value, which caused further losses in public's portfolio and to the firms.

The NBFIs experienced heavy losses since the eruption of the crisis, at first because they were heavily invested in foreign and local capital markets. And later, as the crisis worsened, and funds sources declined (due to the public's withdrawals), their credit portfolio shrank and its value declined which caused a decline in their profits.

Thus credit extensions from NBFIs declined sharply (through bonds and shares, figure 3.5) and the costs of non-bank credit rose (as reflected from the yield to maturity demanded in the primary markets, figure 3.7B).

The decline in fund raising from non-bank markets led to a rise in the demand for banks' credit. But since banks' credit and non-banks credit are not perfect substitutes - because of differences in regulations, in its costs and in the access, (as discussed in chapter 2) - the rise in the demand for banks' credit had led specific sectors in the market to be denied credit (as will be discussed in 3.4).

3.3.2.1. Reasons behinds the turmoil in the non-bank markets:

In an ex-post perspective, the turmoil in the non banks markets was analyzed widely by policy makers as well as by economists. Several features of the non-bank markets were found to account as driving forces in this economic 'fiasco', they include:

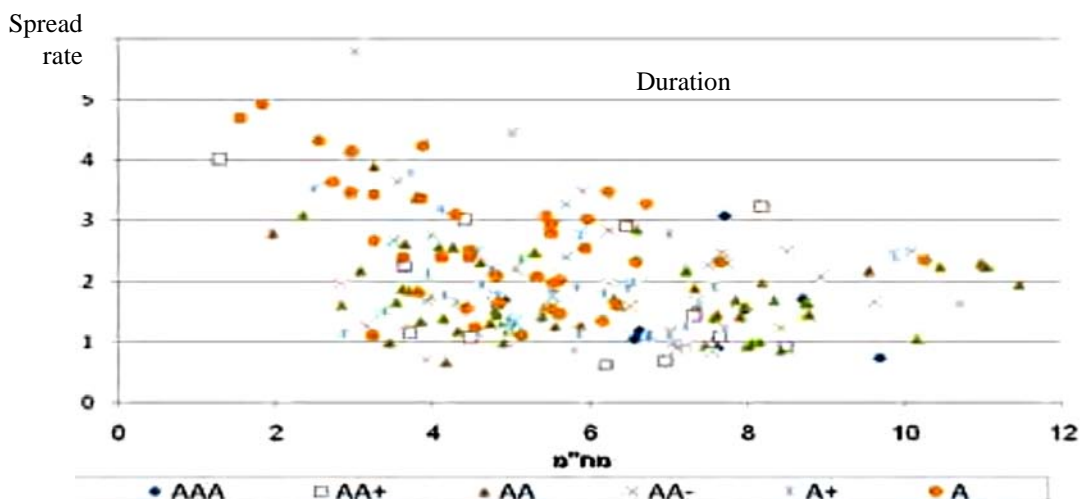
Unexpected growth rates: Non-bank markets (particularly the bonds market) grew rapidly and faster than expected within just a few years, from having been rudimentary up until then. Thus the various players in the credit markets - the institutes, the regulators and the public - had to adjust quickly to the new situation, while being confronted with an economic crisis. In particular NBFIs were adjusting to new fields of expertise and to managing funds in high scales; banks were adjusting to the decrease in their fund sources and the rise of competitive pressure; regulators adjusting to varying extent of responsibilities, supervision and enforcement; and the public to the new investment instruments that were more risky and less informative.

The confidence levels in these markets were accordingly not yet established and were low compared to the experienced and solid banking system. This was expressed throughout the crisis, as the public fled from those markets to the banks, in rates that may have reflected panic rather than based on real economic developments.

Moreover, these markets had low experience in dealing with economic crises, in particular with debt failures (which rose through the crisis), in contrast to the experienced banking system and to capital markets in other countries. There was thus a lot of room for mistakes during the global crisis, and so these economic entities were 'learning by doing'.

'Bubble' prices in the bonds market: the fast growth of non-banks was expressed in the growing demand for securities in 2003-2007. This in turn had encouraged bond issuances, and in particular, low-ranked bonds (A-and-below). Moreover, as lenders were competing on borrowers' (i.e. that the competition in these markets was diverted in favor of borrowers, as discussed next), their lending activities may have led to an undervaluation of the risks in these bonds. This is indicated from the behavior of the spread rates before and during the crisis: before the crisis, 2005-2007 the spreads between AAA-AA bonds **coincided** with the spread rates of A-and-below bonds (i.e. the yields-to-maturity on firms from different ranking classes – low and high – were similar, as shown in figure 3.8). In addition during the crisis the spread of AA-AAA bonds rose only moderately whereas for A-and-below bonds it rose sharply as shown from figure 3.7B. These findings may suggest that low-ranked bonds were misevaluated before the crisis (i.e. the yield-to-maturity was too low) relative to the risk, in other words, there were bubble prices in the bonds market (Zilberman and Gor-Grashgorn, 2009, pp 15-18).

Figure 3.8: Spread Rates of firms from different ranking, before the crisis 2005-2007.



Source: copied from Zilberman and Gor-Grashgorn, 2009, pp 17, figure 12.

Problems that stem from the new structure: the structural reforms described earlier, while improving some aspects of the financial system, had nonetheless adverse implications on the non-banks markets most notable were agency problems and market frictions that were revealed throughout the crisis⁶⁰, these problems include:

1. The type of competition that was created in the non-banks market involved many lending institutes with little cooperation between them, thus the borrowers (firms issuing bonds) held the 'power' in the negotiation process⁶¹. This affected the terms of bonds' issuing, so that bonds were extended although they were unsecured, did not have of hypothecation agreements, and without covenants and other financial standards which are meant to align the interest of the debtor with creditors.

In particular, NBFİ – as being the main purchasers of bonds - did not properly protect the public's funds they managed, by exposing them to low-ranked bonds and unsecured portfolios hence to insolvency risks. Thus NBFİ were blamed for "abandoning the public's money [...] and recklessness management" Parliament's member C.S Shama (personal communication, December 15, 2009). And more descriptively "the non-banks credit is conducted like in the wild west" Parliament's member S. Y. Yachimovich (personal communication, December 16, 2009).

2. Control and Centralization: the level of centralization, as indicated by the market share of financial institutes, show that the high market share of the five biggest banks in holdings of long-term savings declined before the crisis (from 50% in 2004 to 11% in 2007). However, the market share of the five biggest insurance-groups had grown in that period: from 28% in 2004 to 55% in 2007. This indicates that the objective to reduce the banks' dominant rule in long-term savings (of the Bachar reform) resulted in the substitution of this dominance to the insurance sector⁶²

⁶⁰ This section is partially based on (BoI: Annual Report for 2007 [BoI/AR], 2008, pp 134-139). And it is partially based on the findings and discussion over the Hodack committee. The committee was appointed in May 2009 by the capital market commissioner; its objective was to analyze the turmoil in the bond market, see (MoF: Hodack Committee Report, September 2009, pp 9-28) and (*The Marker*: "Hodack committee for regularization of the bond market", by Arlozorov, M., June 22, 2009).

⁶¹ In contrast to the banking system where high centralization levels stems from few lenders and many borrowers, which accordingly imply a high market power in favor of the banks. See also chapter 2.

⁶² For a full discussion see (Capital Markets, Insurance and Saving Division publications: the Capital Market's Commissioner Annual Report for 2007, 2008, pp 52 – 60).

3. Moral hazard of NBFIs: The combination of high competition and higher frequency of reporting may have encouraged NBFIs to take investments with higher yield, and thus with more risks. This point is reflected in high rates of issuances by firms ranked below A (i.e. such firms were encouraged by NBFIs to issue bonds due to their demand for them).

4. Many of the issuances were done without the signature of an underwriting institute.

Moreover, underwriters companies were small investment institutes that took no responsibility on the issuance and were not obliged to invest in these bonds after the issuance (in contrast to underwriters in US and other western countries)⁶³

On the other hand, NBFIs and banks (through their subsidiaries) that are involved in underwriting activities, had a conflict of interest between successful issuance and full disclosure: if an issuing firm also had a 'risky-debt' for such a financial institute (i.e. the debt's default risks grew due to bad investment for example), the institute's interest in the redemption of the debt would coincide with the institute's obligation to fully disclose the firm's financial health. Such conflicts of interests would then reduce the creditability of (some) bonds' disclosures.

5. The public were not fully informed on their new investment options nor the risk embodied in these investments, thus there was a high chance for losses to the public, especially as their investments were managed by institutes that doesn't carry the weight of those risks (unlike the banks)⁶⁴.

6. Ranking agencies This is a blame being put on the ranking agencies that are not as strict as they should be (such as high posts for the public) as well as the banks for the fact that the insurance conflict of interest (since ranking agencies provide the firms) in managing funds in such high extent (in particular, the NBFIs had the most on these ranking agencies, just extending the credit, without responsibility) (see also BoI/AR-2008, pp. 126-127) also found in other countries). In Israel the excess reliance on ranking agencies was partly because NBFIs wanted to save the costs of

⁶³ In the US for example, underwriters are large investment banks, responsible to the firms' examination before and after the issuance, and are invested in the bonds after issued.

⁶⁴ see also: BoI/AR- 2007, 135-139

professional experts and partly because the NBFIs substituted the banks' expertise to the ranking agencies' expertise⁶⁵.

Insufficient regulation and enforcement: the financial markets are being supervised by four different supervision authorities: banks are supervised by the BoI; NBFIs are supervised by the Finance Office through the Capital Market Commissioner, from which there is a delegation to the insurance supervisor and the capital market supervisor (responsible for provident funds and study trusts). The stock exchange is supervised by the Israeli Securities Authority (ISA). In addition the 'Israel Antitrust Authority' supervises the competition in the market.

Thus when the crisis started this structure of 'multiple' supervision authorities, in addition to the fact that the markets had to adjust to the changes quickly and the coordination between the regulators was not yet established, made the regulatory authorities less than prepared for the crisis.

In particular, the regulation on NBFIs was "weak and insufficient compared to the regulation on the banking system" (BoI/AR, 2007, pp138), partly because of insufficient requirements from NBFIs and partly because of a lack of enforcement. One example for insufficient requirement is that of NBFIs' lack of a limitation on 'lending by industry' (which is limited to 20% in the banking system). This enabled the real-estate industry (for example) to raise funds that accounted for 30% of the total funds raised from NBFIs (via bonds, in 2007)⁶⁶. As a result the bonds market was highly centralized. Another example of weaker regulation on the NBFIs show that credit was given to finance firms rather than specific projects (as is the case in banks' lending), thus credit raised in those markets was accounted for firms' owner-capital and was used to raise more credit abroad⁶⁷

The weak regulation and its enforcement may have led to an 'Arbitrage of regulation' i.e. that firms preferred to raise funds through non-banks rather than banks due to the slack regulation there. Thus firms that were not 'creditworthy' for banks, managed to attain credit through non-banks (IMF/IS, 2010, pp 82-83).

⁶⁵ Before the reforms, financial institutes (e.g. provident funds) that were held by banks, have been suspected of misusing the banks' database in order to evaluate their potential borrowers. Thus after the reforms, as these institutes no longer have access to banks' data (nor did they have the adequate experience for valuation), it seems that the institutes relied mostly on the expertise of ranking agencies (Zilberman and Gor-Grashgorn, 2009).

⁶⁶ The distribution of capital raised through bonds, by industry show five main industries: real-estate: 31%; manufacturing: 23%; investment and holdings: 19% financial sector: 15% (2007).(CBS, 2010)

⁶⁷ (*The Marker*): "The Bonds Market in Israel Grew Too Fast", Z.E. Eckstein, interview by Arlozorov M., November 3, 2009)

In particular, the discussion thus far put in light the weakening of non-bank markets compared to the strength of the banking system throughout the crisis⁶⁸. These differences reflect features within each sector at the eve of the crisis: on the one hand the banking system was experienced, engaged in sensible lending, and was highly regulated. Whereas non-bank markets were still growing, highly leveraged and with insufficient regulation and enforcement. Moreover, these two sectors differ in the scale and type of their market frictions: the centralized and 'powerful' banking system versus the non-banks where the borrowers (issuers of bonds) account as the 'powerful' party. And, most importantly, the agency problems within the banking system were mitigated before the crisis as a result of the Bachar reform (2005), through its main action: to transfer the control of provident funds and trust units from the banks to NBFI. At the same time the agency problems within non banks were 'flourishing', as described above. In other words: "the Bachar Reform Saved the Market from the Financial Crisis, but did only Half the Job", G.R. Rolnik (personal communication '*The Marker*': "*The Bachar Reform Saved the Market from the Financial Crisis, but did only Half the Job*", by Rolnik, G., May 7, 2009).

In particular, in the context of the **Financial Accelerator**, the fact that the global shock to the Israeli market led to such adverse endogenous changes within the non-bank markets – whereas the effects on the banking system were mild – may thus be explained in the 'spirit' of the financial accelerator, since a great deal of these differences stem from the severe agency problems within the non-bank markets.

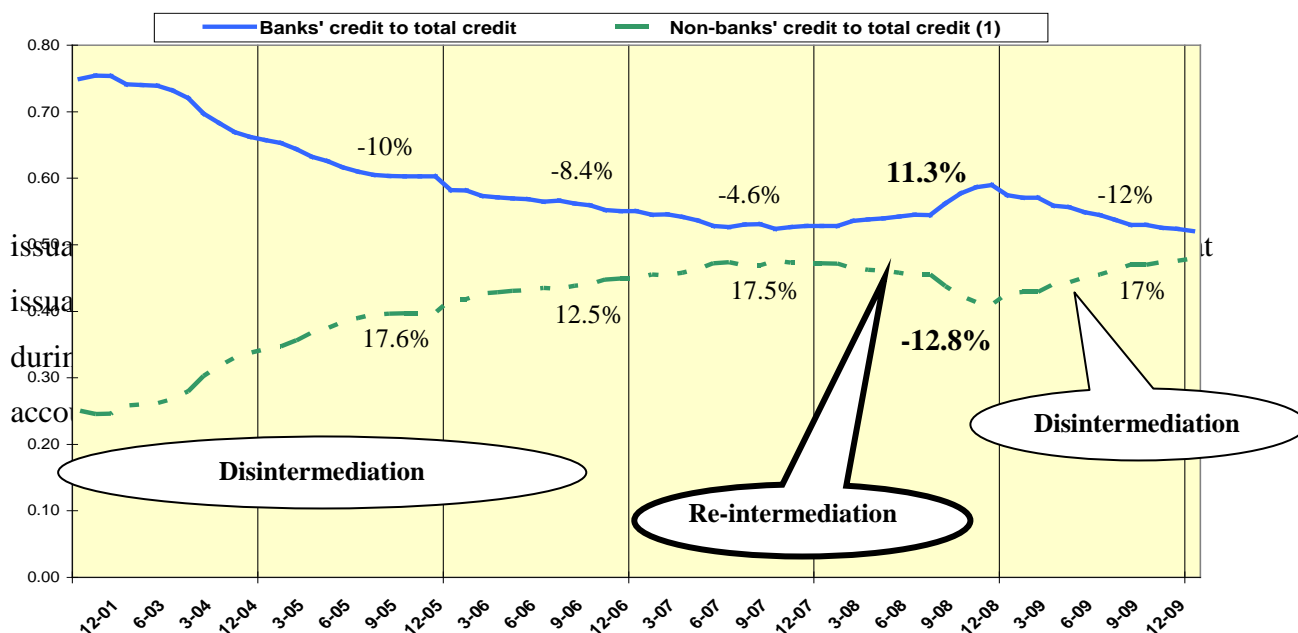
3.3.2.2. Re-intermediation throughout 2008

Throughout 2008, as the crisis got worse and non-banks' lending shrank, the extent of banks' credit to the business sector grew significantly: from NIS 355.6 billion in the last quarter of 2007 it rose up to NIS 389 billion in the last quarter of 2008 - a yearly growth of 11.3%. This was the highest growth ratio of banks' credit in years (i.e. since the last recession in 2001-2002), as credit demand was mainly satisfied by non-bank sources (i.e. disintermediation in the market until 2007, see figure 3.9). Thus after years of contractions in banks' weight in the public's credit portfolio, their weight rose: from 52% in 2007 to 57% in 2008. Similar Re-intermediation was also exhibited at the previous recession of 2001-2002, where banks' credit rose by

⁶⁸ See e.g. (Zilberman and Gor-Grashgorn, 2009, pp 16-17) and (IMF/IS, 2010, pp 26-30 and pp 71-83).

12.3% during the second half of 2001 – a rate that was much higher than the first half of 2001 (of 3%).

Figure 3.9: The contribution of each sector to businesses' credit: the share of banks' credit in total credit Vs the share of non-banks' credit (1) to total credit, 2001-2009.



(1) Non-banks credit include credit from NBFIs, credit-card companies, foreign residences, government, households and financial and businesses firms.

Source: BoI data, April 2010, table 2.

The 're-intermediation' was also exhibited in the public's financial assets, namely that public assets moved from non-bank market towards the banking system throughout 2008, particularly since September - when the crisis got worse. As a result the weight of banks' deposits in the public's asset portfolio rose sharply from 29% in 2007 to 35.3% in 2008, and the share of tradable assets (managed by NBFIs) declined from 41.8% to 32.3% (see figure 2.6). The decline in the tradable part of the portfolio reflects the public's vast withdrawals from NBFIs (discussed above).

The Re-intermediation in 2008 was to a large extent the result of the turmoil in non-banks ('Substitution Effect'): the dry-out of non-banks funding sources led businesses that were depended on these funding sources to substitute their demand for credit to the banking system. This 'substitution effect' during economic downturn have been supported empirically within the Israeli market (Ruthenberg and Hecht, 2006, as referred by BoI/BS, 2009, pp 28-30): findings on past business cycles in Israel indicate a strictly negative link between the elasticity of demand for banks' credit and issuances of securities (i.e. when bonds issuances declines, the demand for banks' credit rise).

There were other factors working to increase the demand for banks' intermediation, these include: a 'Substitution effect' of foreign funding sources due to liquidity crises abroad (though this effect worked in lesser extent than the substitution of non-banks)⁶⁹; an 'inverse' Income Effect': when GDP **declines** the demand for bank credit is expected to **increase** since firms will need more funds in order to finance the contraction in their working capital (due to a decline in activity)⁷⁰; and a decline in the risk appetite of investors, as usually happens during times of uncertainty, which makes the safer financial channels – banks and government bonds - more attractive. For comparison, in the previous recession of 2001-2002 public assets were also diverted to the banks in the last half of 2001– after several quarters of decline in the extent of deposits. Thus as banks' funding sources (deposits) grew, they were able to extend more credit.

The Re-intermediation of 2008 was not a long-term trend, and as happened in the previous recession (where banks' credit declined by 1% in the first half of 2002) – this trend was relaxed as of 2009 (see figure 3.9). In particular, since non-bank markets were recovering, credit extensions from these channels renewed and amounted to a growth rate of 17% during 2009. At the same time the extensions of banks' credit began to decline, and amounted to a negative growth rate of 12% in that year (as figure 3.9 shows). In addition, the rate of the public's extractions from NBFIs declined as of the first half of 2009. In other words, the market's Re-intermediation of 2008 had turned back to the Disintermediation trend of before the crisis.

The decline in banks' credit in 2009 has been attributed by the authorities to lowered **demand** for it, rather than supply limitation in the banking system (i.e. that the supply of credit was cartelized due to a liquidity crunch, for example⁷¹). This conclusion stems from a combination of three reasons: first, (some) firms were able to substitute back to the reviving non-banks markets. Second, the price of banks' credit declined as of 2009 thus was less limiting for businesses to borrow (see figure 3.11). And third business surveys suggest that the severity of their funding limitations declined in this period for all industries (as shown in figure 3.3A).

⁶⁹ Foreign funds to the business sector are obtained through issuances of bonds and shares abroad and buybacks – 'tradable credit' and through foreign banks – 'non-tradable credit'. throughout 2008 the extensions of non-tradable credit declined to one fourth of its amount in 2007, while tradable credit rose - up to 3 times of its amount before the crisis (the share of both types of credit from total credit rose in 2008, but that is also because total credit declined). Data is taken from (BoI/BS, 2009, pp 28).

⁷⁰ The prediction here of an 'inverse income effects' was found relevant for the Israeli market during economic downturns: i.e. the demand for banks' credit rise when GDP rises as well as when GDP declines, though to a lesser extent (i.e. there is a downward rigidity in banks' credit extensions to the business sector). (Ruthenberg and Hecht (2006), as referred by (BoI/BS, 2009, pp 28-30)).

⁷¹ See also (BoI/IR 2009:1st quarter, 2009, pp 17); and (IMF/IS, 2009, pp 27).

To sum up, the source of credit to the business sector varied throughout the crisis: in 2008 credit was mainly extended from the banking system; and in 2009 it was extended from non-banks. As discussed, this variation in credit-sources in those years was triggered from the turmoil in non-banks markets that lasted until 2009.

In particular interest (for this paper) is lenders' attitude toward borrowers from different creditworthiness classes, in other words were there indications for a **Flight to Quality**. This is the objective of the next (and last) subsection.

3.4. The 'Flight to Quality': Reasoning and Findings.

According to the 'Flight To Quality' (FTQ) lenders' attitude toward low-quality borrowers compared to higher quality borrowers should differ when credit market friction are present because, as explained in chapter 1, low quality borrower embodies unattractive risks and accordingly more costs than high quality borrowers. This subsection describes the reasoning for FTQ in the case of the Israeli market through the crisis (in 3.4.1) and then addresses the empirical findings (in subsection 3.4.2).

3.4.1 Reasoning for FTQ

Non-banks' lending activities – their ways and extent - were affected from the drain they were experiencing as well as the uncertainties stemming from the global crisis. In addition lending to public firms was affected from ISA's new regulation on corporations' reports which state that as of 2008 the financial reports of public corporation will evaluate assets according to their economic value, rather than their price at purchase (ISA: Ref. Espousal of International Financial Reports standards [IFRS], July 2006). Given that assets' value is pro-cyclical, this new standard implies an excess decline in corporations' balance sheets (i.e. compared to without the standard). This in turn reduces corporations' perceived creditworthiness as well as their securities' value. Thus lending to corporations might be limited on the grounds of this new regulation. It should be mentioned that Israel is the first country in the world to execute this standard already in the reports for 2008.

Banks' lending activities – their ways and extent – were affected by several factors: First, as borrowers from non-banks substituted their funds' demand to the banks, the banks' pool of potential borrowers had grown and its composition changed, so that it involved a

larger share of high-quality borrowers (since it was mostly high-quality borrowers which attained funds through non-banks before the crisis, as discussed in chapter 2). Thus banks had an incentive to extend loans to its higher-quality borrowers, while discriminating low-quality borrowers, due to the excess risks and costs of the latter.

Second, in 2007, the banks' supervisor raised the capital adequacy ratio required from the banks: from 9% to 12%, to be attained by the end of 2009 (in line with Basel II)⁷². In order to meet the requirement banks had to either limit their supply of credit or raise more funds (through capital markets and or through deposits). In any case, the indirect effect of meeting this requirement was that the amount of credit available for the private sector declined. In particular, this gave the banks an incentive to extend loans to less risky borrowers, i.e. borrowers with low default risks, since banks' risky loans reduce their capital adequacy⁷³. Moreover, the crisis led to deterioration in banks' balance sheet, which adversely affected their creditworthiness. As indicated from the growth in the banks' spread rates: from 0.6 in 2006 it was tripled to 1.9 in 2008, and from the decline in the 'Market to Book' ratio: from 1.2 in 2007 to 0.6 in 2008 – below 1 – which reflects that the investors perceive the banks' book-value as overestimated compared to its market-value (see chart 3.1). This deterioration in the banks' balance sheets was a result of rising expenses due to doubtful debts and in the share of problematic borrowers (from total balance credit, see chart 3.1). In particular, these shifts in banks' credit-risk had adversely affected banks' current capital adequacy (i.e. without the additional capital requirement)⁷⁴.

Chart 3.1: Capital Adequacy, Banks' Quality and Credit Quality in the Banking System, 2001-2008

		2001	2002	2003	2004	2005	2006	2007	2008
Banks' capital:	Capital adequacy (Percent)	9.38	9.90	10.32	10.73	10.67	10.82	10.96	11.22
	Equity capital to total assets (percent)	4.88	4.88	5.30	5.46	5.57	5.87	6.09	5.70
Banks' quality:	Market to Book Ratio (MV/BV) (1)	0.8	0.6	0.8	1.0	1.4	1.3	1.2	0.6
	The average spread rates between banks bonds and government bonds.	0.8	0.8	0.7	0.8	0.7	0.6	1.1	1.9
Banks' credit	The ratio of yearly expenses due to the provision to	0.58	0.93	0.78	0.61	0.45	0.33	0.17	0.47

⁷²For a review of Basel II and the associated financial requirements see (*Basel II: International Convergence of Capital Measurement and Capital Standards: A Revised Framework*, November 2005)

⁷³ The main index for assessing banks' capital adequacy is the ratio of equity to risk weighted assets. The denominator of this ratio rises when banks' share of risky assets grow, thus a rise in problematic loans lead to a decline in the capital adequacy.

⁷⁴ See footnote 71.

quality:	doubtful debts in total credit risk, multiplied by 100								
	The share of no-income credit in the total credit (percent)	1.7	2.5	2.6	2.5	2.3	2	1.5	1.5
	The share of problematic borrowers in total balance credit (percent)	8.8	10.1	10.5	10.6	9.5	8.4	6.2	7.0

(1) The MV/BV ratio expresses the correlation level between the market value of banks' stocks capital - according to investors ('the economic value') and the accounting value in the books. When this ratio is higher than one it indicates that investors evaluate the bank more than its balance value – i.e. it is worthy to invest in banks' securities since their potential is not realized; and vice versa (when this ratio is below one).

Source: (BoI/BS, 2009, pp 100 (chart C-1))

Of particular interest (for this paper), this chain of events – a stricter monetary requirement that reduces banks' available capital, and thus banks' financial health – resembles to the **'Bank-Lending channel'** discussed in chapter 1. Which theoretically speaking, could have resulted in a credit crunch and amplification of the crisis, because when it is costly and difficult for *lending institutes* to attain a sufficient amount of new funds, lending activities contract and thus affected borrowers are forced to slow down their spending activities. However as noted earlier, banks' credit extensions did not halt in that period nor did the real activity resulted in 'excess declines'. In other words, the theoretical prediction of the 'Bank-Lending Channel' has not been realized.

The reasons why such scenario was avoided could be (could have been) because banks' capital requirement was refined with a government guarantee (of NIS 6 - 12 billion, i.e. it rose to 12 in April 2009), for bank's issues of deferred notes to be classified as Tier II capital (i.e. these funds will be accounted for capital adequacy). However, the banks did not use these funds and preferred to raise capital independently (mostly by issuing bonds, from profits and from public deposits)⁷⁵.

Other factors that might have affected the banks' lending decisions:

⁷⁵ See also (IMFIS, 2010, pp 12).

Sub-channel due to banks' level of optimism. In Zilberfarb et al. (2005) the authors find empirical evidence in the Israeli market suggesting a negative link between the banks' optimism level and the credit-risk they extend - as measured by the height of securities charged against these loans. Put differently, when times are good and banks' optimism levels are high, banks tend to overestimate securities' value and thus give loans more easily than they should (i.e. securities' value should be evaluated according to their expected value in 'bad' times). The article then concludes that with these settings, adverse shocks will be amplified – through a financial accelerator sub-channel: since relevant firms will not be able to repay their debts and thus reduce their activities, which in turn will affect other firms in business with them and of course, the banks. Another implication of this finding might be that this sub-channel works the opposite when times are bad: low optimism lead banks to lend in a more strict matter. The combination of these two implications will thus adversely affect potential borrowers, particularly those with less equity (i.e. smaller amount or lower value of assets that can serve as collaterals).

Political unrest: In September 2008 the former prime minister had resigned, leading to new elections in April 2009. In addition, the government's budget for 2009 had not been approved thus far by the Knesset.

These events had two implications on the market – beyond the uncertainty it adds⁷⁶. First, since the elections coincided with the discussion for the 2009-government budget, the budget had been delayed to July 2009, and so the budget for the first half of 2009 was set to be 1/12 of the budget for 2008. As a result the potential of the stabilization policy was smaller: the execution of an expansionary fiscal policy is problematic in the immediate-term since any change/expansion in the budget will require the approval of the Knesset, which added unnecessary difficulties and cumbersomeness (in particular, since the budget for 2008 was not designed for such stabilization activities, it does not cover them). Thus throughout 2008 the only stabilizing activities the market had at its disposal was monetary. The government's rescue plan for the market was executed in January 2009, whereas in other countries a rescue plan was executed in September 2008 - right after 'Lehman Brothers' collapsed (for example in US, UK, Euro area and Russia).

⁷⁶ E.g. the uncertainty from the future budget and the type of rescue plan that will be taken- in the most critical months of the crisis. For example the public fear of loosing their savings since there is no deposit insurance fixed in the Israeli law. Historically government practices did compensate and rescued financial institutes (and the deposits within them), so experience does give hope for such rescue. But given the high losses the public had experienced since the beginning of the crisis, and that these losses stemmed from NBFi practices (that is neither insured nor familiar to the public), the implied uncertainty from this political unrest is rational.

The second implication of having an election in the middle of a financial crisis is in connection to political considerations: it has been argued⁷⁷ that with upcoming elections, politicians are mostly concerned with financing their political agenda, thus they were dependent on banks for credit. Therefore the necessary political pressure on banks - to reduce the costs of credit - was silent.

The government's rescue plan for the market 'could' have affected banks' lending as of 2009 (i.e. execution time). In particular, given that FTQ is expected to affect SME and or risky industries (see below) the plan affected banks' attitude to lower-quality borrowers since it included a government guarantee for SME (of NIS 2.3 billion) to encourage banks' lending to SME; in addition, the government executed several actions to aid the real-estate and construction industry (which was hit the most from the crisis). These actions included directed-credit and alleviating bureaucracy procedures in construction activities.

3.4.2. Testing for 'Flight to Quality'

The empirical discussion presented below includes several empirical tests, based on the FTQ indicators discussed in subsection 1.2. The discussion was narrowed down in accordance to the data available at the time this paper was written.

FTQ hypothesis 1: The composition of credit extensions will consist of a growing share of 'high-quality' firms and a smaller share of the 'low-quality' firms.

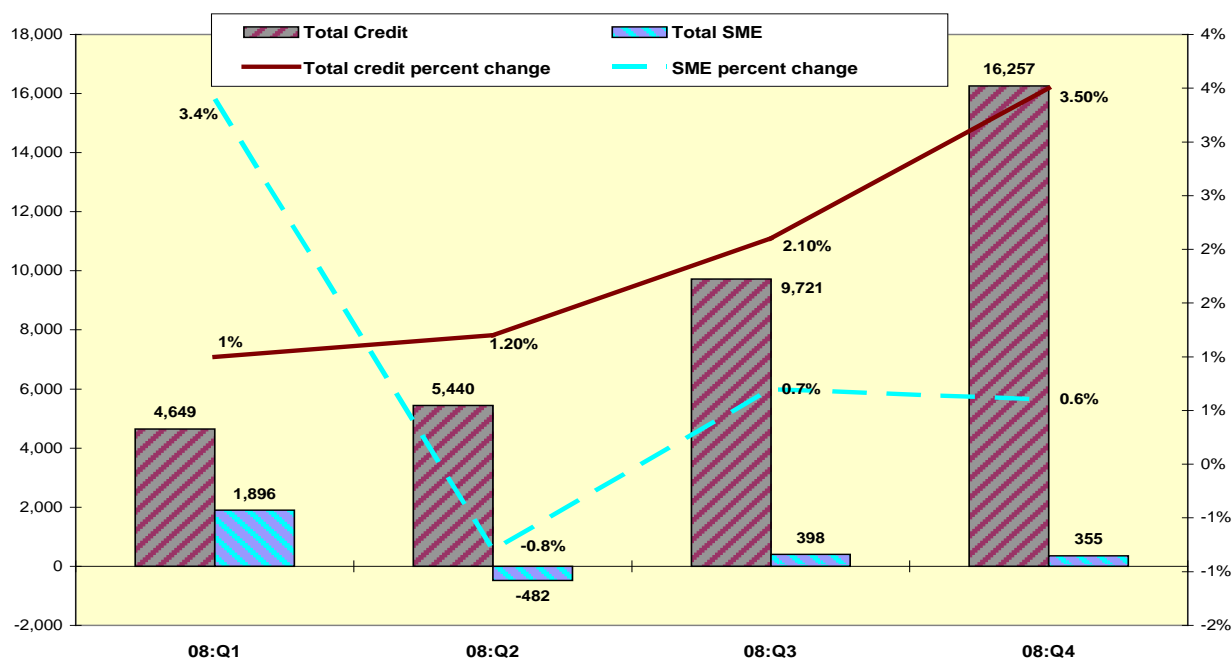
Banks' credit - according to size of firms, 2008 - 2009

In 2008, the distribution of banks' credit, by size of business, shows that most of the growth in credit extension was indeed given to large firms, whereas credit extensions to SME had stopped as of the second quarter of 2008 (see figure 3.10). In that quarter, total credit growth was NIS 5,440 million (+1.2%), whereas for SME's it **declined** (negative growth) by NIS 482 millions (-0.8%). In the following two quarters, total credit growth had accelerated to 2.1% and 3.5% (chronologically) but credit-extension to SME had grown by only 0.7% and 0.6%

⁷⁷ This discussion over the lack of political pressure on the banking system was published in two newspaper articles: The BoI Governor, S. Fisher accused the banks for not reducing the cost of credit thus not contributing to the rescue plan (*Ynet.co.il: "Fisher rebukes the banks for not contributing to the aid plan"* by Hason Y. December 23, 2008). The Governor's accusation was followed with a commentary article stating that "BoI doesn't have the authority to interfere with the spreads that the banks are charging [...] there is no substitute for the pressure that the political system, along with the media, can use against the banks to reduce the price of credit" (*Ynet.co.il: "The banks are strangling the market. What to do?"* Lavi, Z., January 1, 2009)

respectively. These findings indicate that the growth in bank credit to large firms came on the expense of SME during 2008.

Figure 3.10: Banks' credit extensions to the business sector and to SME, 2008 (1)



(1) The data for 2009 was not available at the time this paper was written.

Source: (BoI/BS, 2009, PP 24-25).

Banks' credit in 2009⁷⁸: As discussed above, from the first quarter of 2009 the re-intermediation of 2008 stopped, and, in particular, banks' credit declined. This decline was attributed to the lowered **demand** for it – a conclusion that was partly driven from the companies' surveys that indicated a relaxation in fund limitations (as reported by all industries and by large and medium sized firms). However as also indicated from these surveys (figure 3.3B), for small businesses, funding limitations were fluctuating since the peak of the crisis, declining at first but raising up again in the second quarter of 2009. Thus the conclusion above – that banks' credit declined because there was less demand for it – does not seem to apply for small businesses (which account for 50% of total businesses). In other words this may indicate FTQ of banks from small businesses also in 2009.

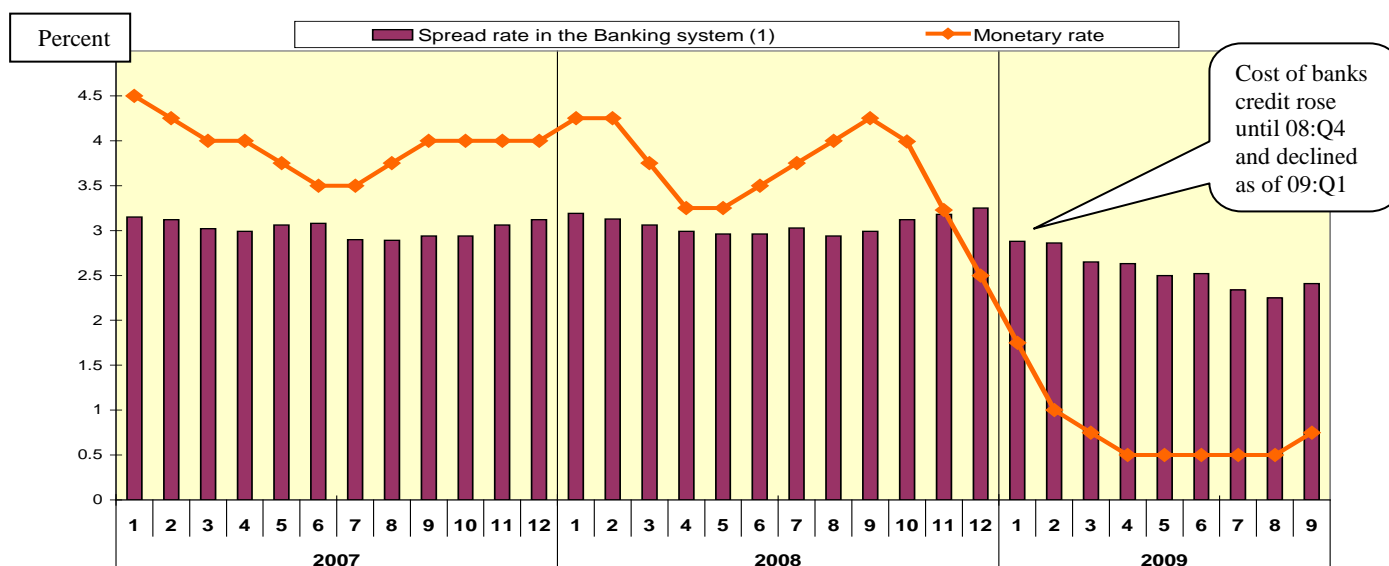
The Banks were Credit Rationing in 2008: a closer look in the **cost of funds** via banks evolved in non-uniform fashion during 2008: it fluctuated moderately during the first three quarters (it increased and then decreased) but ascended in the last quarter (figure 3.11). In 2009 it declined as of the first quarter.

⁷⁸ The data for 2009 on the distribution of credit by firm's size was not available when this paper was in print.

The rise in the interest rates charged by the banks occurred in spite of (simultaneously with) the engineered reductions in the monetary rate. This reflects a rise in the 'market power' banks had operated against the business sector, particularly in the last quarter of 2008⁷⁹.

The increase in banks' market power was a result of two factors: Demand factors: because banks' competitors – domestically (non-banks channel) and from abroad – have been drained and firms had to substitute their credit needs to the banks, banks were able to increase their costs of lending without having to bear the outcome of losing clients. In other words, the growth in banks' market power/excess cost of credit reflects the rise in banks' monopolistic power inherited in that period. Supply factors: the rise in the risk quality of borrowers (which led to a rise in the credit risk in 2008) led banks to try to mitigate those risks by keeping the interest rate at high levels.

Figure 3.11: The Monetary rate Vs Banks Yield-Spread: the interest rate on un-indexed credit minus the rate on deposits, 2007-2009.



(1) Defined as the yield on assets less cost of liabilities

Source: BoI data, March 2010, table G-1.

Taken together, throughout 2008 there has been a combination of high interest rates charged by banks, along with credit growth that was mostly extended to large businesses, leaving SME's demand for credit unmet. Thus in 2008 banks were **Credit Rationing**⁸⁰ the SME

⁷⁹ In BoI/BS (2009, pp 17-19) banks' market power is defined as $[(\text{price of credit to firms}) - (\text{cost of credit to banks})] / (\text{price of credit to firms})$. Where the price of credit is the average interest rate banks charge on non-indexed credit, and the cost of credit is the average inter-bank interest rate. Thus this ratio represents the 'market power' banks use against the private sector (i.e. the mark-up). Then the data in BoI/BS shows that the market power against businesses rose sharply in the last quarter of 2008 – by 55%.

⁸⁰ (Stiglitz and Weiss, 1981); and this paper subsection 1.1

sector. Banks' 'credit rationing' can be thought of as an equilibrium outcome of 'Flight to Quality' - given that SME are considered as high-risk borrowers.

FTQ hypothesis 2: Issuances of private placements will decline whereas issuances of tradable bonds will not (or decline less).

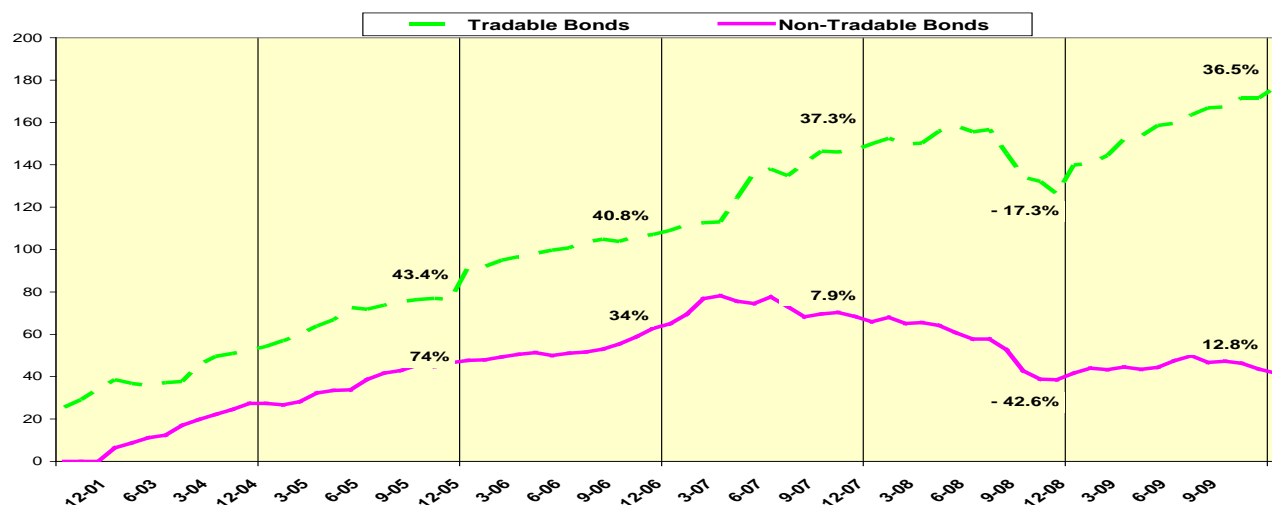
Figure 3.12 shows that there has been a decline in the credit extended to the business sector – both in tradable bonds and in non-tradable bonds. It also shows that the reduction in non-tradable bonds was much higher than it was in tradable bonds: total reduction was -41% in the former, compared to -25% in the latter.

Moreover in 2009, as capital markets revived, and credit extensions through these channels rose, the distribution of credit in tradable bonds grew steadily but it had been fluctuating in the non-tradable bonds – going up the first few months and down and up again or constant. In total, until November 2009, the percent growth in tradable bonds accumulated to 36.5%, but it was only 12.8% in non-tradable.

Given that issuers of tradable bonds are 'high-quality' firms, whereas private placements are usually issued by low-quality firms (e.g. because of the high costs from publishing prospectus); and given that all needed the funds - this indicates that lower-quality firms had an excess reduction in fund raising - compare to the higher-quality firms in 2008 and still in 2009. Thus these findings support the FTQ hypothesis.

However, data also show that banks' credit extensions to the business sector in 2008 was mostly given to firms who had issued non-tradable bonds (in December 2008): out of the total NIS 757.6 million extended to the business sector, only NIS 173.6 million (22.9%) was extended to firms that had issued bonds in December 2008 – the rest was given to firms that did not issue bonds at that time. In particular, the excess fund limitations such firms experienced in non-banks may have been facilitated through banks. (BoI/BS, 2009, pp 112, chart C-5).

Figure 3.12: Credit to the Business Sector: tradable Vs non-tradable bonds, 2001-2010 (NIS billion, current prices).



Source: BoI data, April 2010, table 2.

FTQ hypothesis 3: the external finance premium grows such that low-quality borrowers paid more than high-quality borrowers.

Non-banks⁸¹: In order to test this hypothesis, I compared the evolution of the spread rates in the bond market i.e. the difference between the yield on CPI-indexed private bonds and government bonds. Findings show an excess rise of spread rate 'lower-quality' borrowers in two cases:

Firms with different credit ranks: the spread rates for AA – AAA bonds grew modestly throughout 2008, peaking at the last quarter of 2008 and the first quarter of 2009; after which these rates declined back to their pre-crisis levels. In contrast, the spread rates on non-ranked bonds had grown since 2007 from 5% before the crisis to above 20% at the peak of the crisis; in 2009 these rates declined but they remain higher than their pre-crisis levels (see figure 3.7B). Similar development was exhibited with 'A'-bonds - though with lower ratios (see BoI/IR– 2009: 3rd quarter, 2009, pp 18-19).

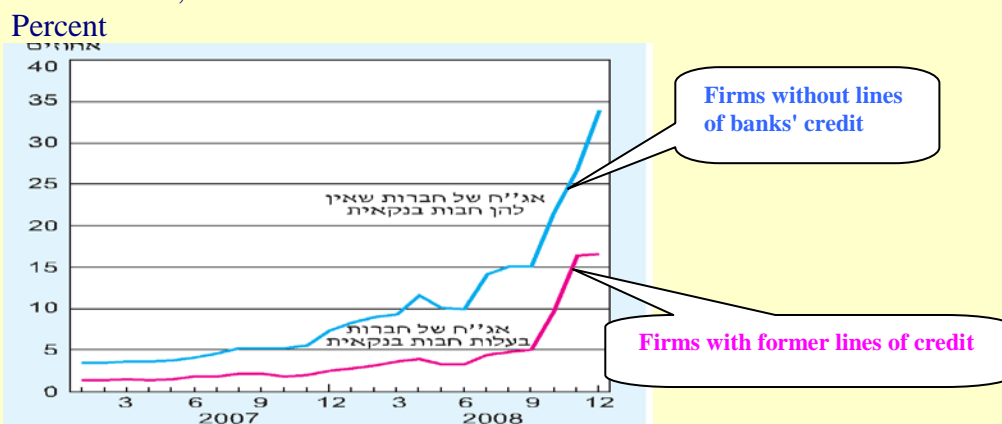
However, as discussed in subsection 3.3, this excess rise of spread rate of lower quality bonds may reflect a correction of the too-low-rate these bonds had before the crisis (i.e. correction of the bubble prices), rather than credit discrimination (i.e. FTQ).

⁸¹ Data on the costs of **banks'** credit by firms from different creditworthiness was not available at the time this paper was in print.

Firms with bank's line of credit Vs firms without: findings show that in 2008 firms with previous lines of credit had a smaller growth in their spread rates than firms without (see figure 3.13).

This difference may have occurred because firms with banks' lines of credit are subject to close supervision and cautious monitoring by the banks. This, in particular, **signals** the non-bank lenders that such firms are less risky than firms without banks lines of credit. Therefore these differences in spread rates are associated with FTQ.

Figure 3.13: Spread rates in the bonds market: firms with banks' lines of credit Vs firms without, 2007-2008



Source: the figure is copied from BoI/BS-2008, 2009, pp103 (figure C-3).

FTQ hypothesis 4: lenders' discrimination by industry.

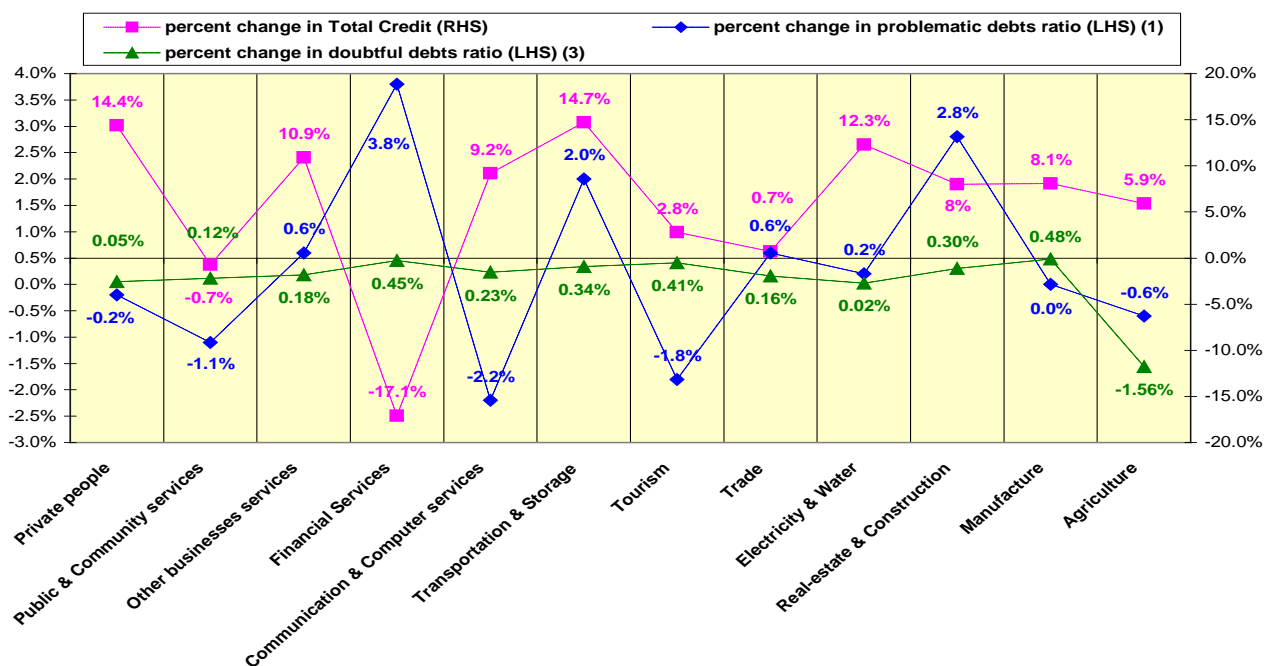
The FTQ theory implies that lenders would discriminate industries whose firms' creditworthiness declined sharply throughout the crisis. Specifically it includes industries that initially – before the crisis - had a large share of low-quality borrowers (e.g. industries whose share of SME is relatively large) or industries that were hit the strongest from the global shock (e.g. industries with high exposure to the crisis). The reasoning for this conclusion is straightforward: lenders limit their supply of credit from firms that experience **excess** decline in their net worth. Because such firms' default risks rise sharply, making them less attractive for lenders. Accordingly, lenders would discriminate such firms and at the industry level the credit supply would decline and or their cost of credit would rise.

The findings show that lenders' attitude varied across lenders: banks and non banks (i.e. the bonds market).

Banks' credit

Figure 3.14 describes the changes in default risks of banks' loans, according to each industry. An industry's default risks rise when its credit-quality deteriorates. In the figure this deterioration of an industry's credit-quality is indicated from a rise in two ratios: its 'doubtful debts ratio' – defined as the percent change in the industry's weight of doubtful debts (from total credit to the industry); and its 'problematic debts ratio' – defined as the percent change in the industry's weight of problematic debts (from total credit to the industry). Thus, in accordance to the FTQ hypothesis, I focus here on industries in which there were sharp increases in credit risks (positive and high change in the problematic debts and doubtful debts ratios). As the figure shows, this happened in two industries: the financial services industry and the Real-estate and construction (REC) industry⁸².

Figure 3.14: Banks' credit extensions and Credit quality, by industry: percent change 2007-2008 (read vertically).



(1) I defined the 'Problematic debts ratio' as the percent change in the industry's problematic weight (i.e. the share of problematic debts in the total credit balance to the industry). A rise in the ratio indicates a reduction in the industry's creditworthiness.

(2) I defined the 'Doubtful debts ratio' as the percent change in the industry's 'doubtful weight' (i.e. the share of the expenses from provision for doubtful debts in the total balance to the industry). A rise in the ratio indicates a reduction in the industry's creditworthiness.

Source: (BoI/BS, 2009, pp 111 (chart C-4)). See also appendix A2 in this paper.

In the financial services industry, firms' creditworthiness declined sharply during the crisis: the 'problematic debts ratio' rose by 3.8% and the 'doubtful debts ratio' by 0.45%. This adverse

⁸² Note that for the trade industry and the other business services industry – where most of the SME are – the changes in the credit-quality indicators were mild, accordingly I disregard these two industries (especially after the discussion in FTQ 1 above).

evolution in creditworthiness of the financial services industry reflects the turmoil in non-bank institutes, which had an adverse effect on such institutes' default rates and net worth – particularly NBFI.

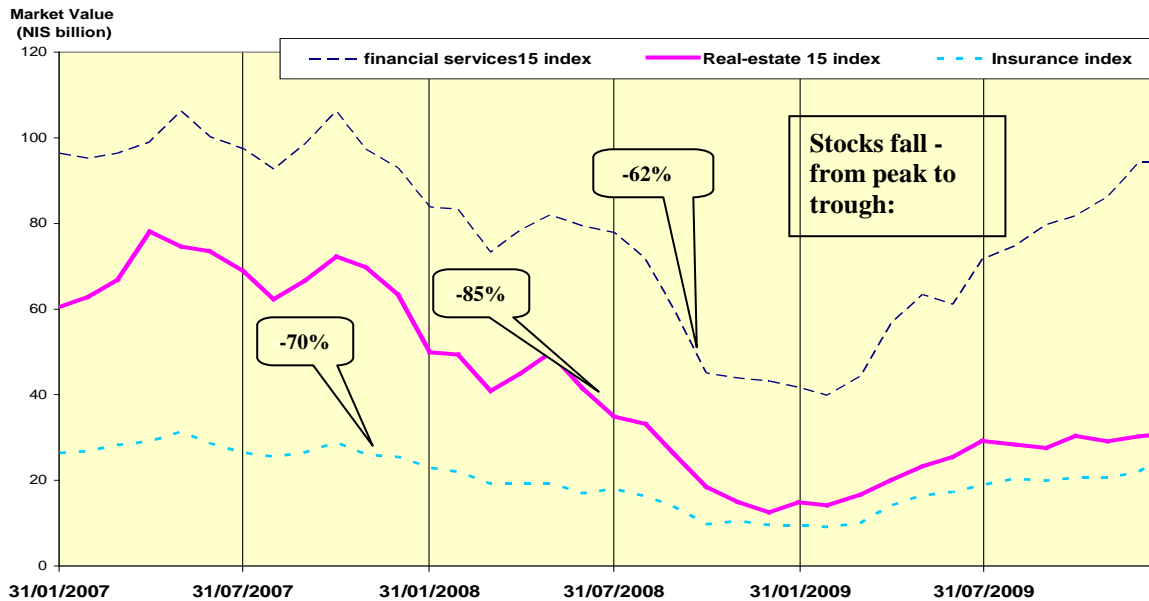
In accordance to the FTQ hypothesis, banks' credit to this industry declined: from NIS 185 million in 2007 to less than NIS 153 million in 2008 – a 17.1% reduction⁸³. Moreover the weight of this industry in the banks' credit portfolio shrank from 17.3% in 2007 to 13.7% in 2008 (see chart A.1). This development came after several years of growth in credit extension to this industry (figure 3.16).

However, in contrast to the financial services industry, the REC endowed with an increase in banks' credit extensions of up to 8% during 2008, and REC's weight in banks' credit portfolio rose from 16.4% in 2007 to 16.9% in 2008, (see chart A.1). These findings are reinforced in the companies' surveys presented in figure 3.3A, where REC firms had low funding limitations - relative to other limitations, and in contrast to all other industries.

The difference in banks' attitude toward these two industries is interesting for several reasons: first, the REC industry was hit very strongly from the crisis, as firms from this industry were heavily invested in real-estate abroad, where assets prices declined since the beginning of the crisis. Accordingly REC firms' creditworthiness declined through the crisis, as can be seen from the reduction in their stocks' market-value - of up to 85% from April 2007 to December 2008 (from peak to trough). In particular, the declines in REC' stocks were worse than in the indexes for financial services (as shown in figure 3.15). Moreover, bonds of REC firms declined sharply in the secondary market (e.g. the excess decline of Tel-bond 40 relative to Tel-bond 20 in figure 3.7A is attributed to the high weight of REC firms in the 40-index), and the yield-to-maturity on REC' bonds in the primary market rose sharply – highest among all other industries (figure 3.17).

⁸³ However the 17% decline in credit balance for this industry was biased upwards since it is governed by a realization of foreign holding, which accounts for 7% of this reduction in banks' credit (i.e. bank Hapoalim sold most of its foreign MBS and ABS holdings – which were valued NIS 3.4 billions - out of the total decline in credit of NIS 31.8 billion – this amounted to 7% out of 17.1% total reduction). The rest of the reduction (10%) was due to credit decline as well as to a decline in financial assets (the value of bonds held by banks). So although credit from banks to the financial services did shrink, the rate of which (17%) was lower (10%).

Figure 3.15: Real-estate and construction industry Vs financial services industry- Stock markets indexes: REC-15 index (1), Financial-services-15 (2) index and Insurance index (3), 2007-2009.



- (1) REC-15 index and financial services 15-index include the stocks with highest market value in each industry.
 (2) 15-financial services index is "biased upwards" due to the high weight of banks' shares in the index – of 65%. In other words it does not reflect the losses of NBFI.
 (3) The Insurance index describe the all the stocks that are included in the insurance sector.
 Source: TASE data (April 2010)

Second, REC firms perceived risk levels were high at the beginning of the crisis due to high leverage ratios (debts to assets). Excess leverages is typical for the REC industry (i.e. it is not unique to the Israeli market) since these firms engage in long-term projects with high constant costs and highly cyclical revenues (i.e. the prices of the durable assets they sell) (Zilberfarb et al. 2005, pp 103).

The high leverage in the REC industry had implications on the credit quality of these firms before the crisis, as shown in the high weight of REC's problematic debts from total problematic debts in the business sector before the crisis (see figure 3.16). In particular, this share was much higher than the share of financial services in banks' problematic debts (as the figure show).

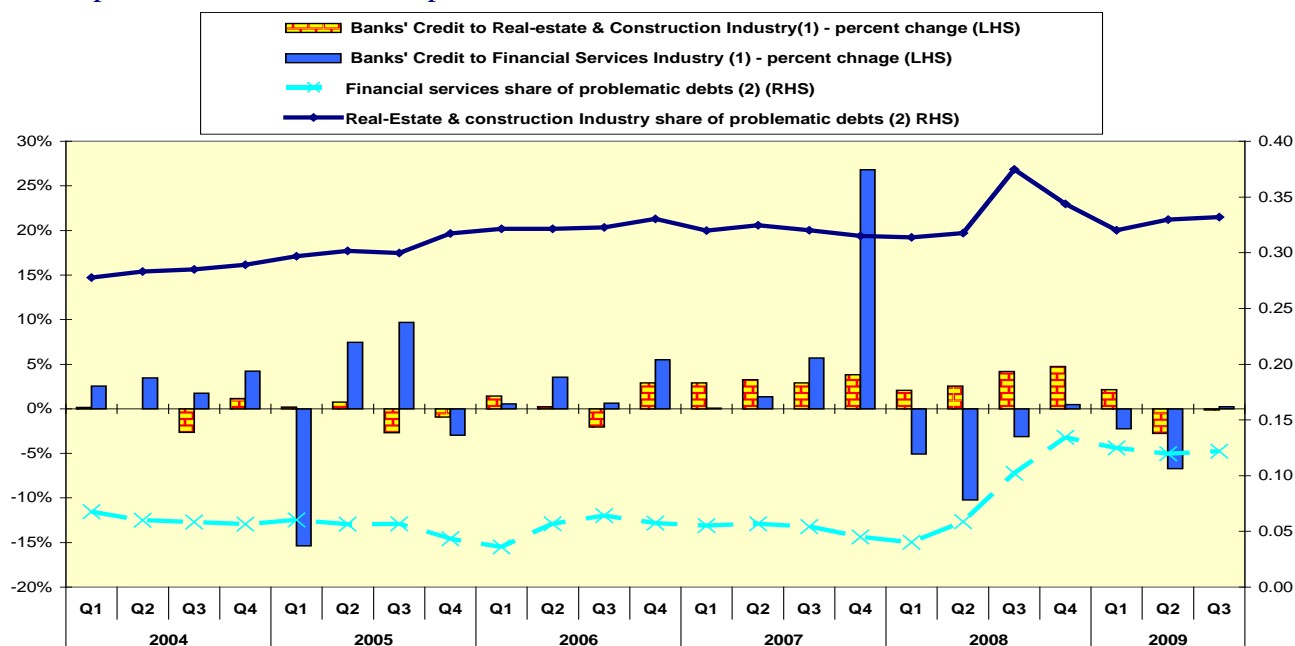
Moreover since asset prices abroad had declined throughout the crisis, REC's leverage ratios grew, and their profits declined. Both had led to further reduction in REC's firms' creditworthiness. Thus their banks' credit quality declined during the crisis (i.e. the rise in problematic and doubtful debts ratios in figure 3.14) and REC's extent of insolvencies during the crisis was very high (and the highest): out of 27 public firms that entered arrangements of

creditors from October 2008 to May 2009, 13 are firms from the REC industry, their nominal value account for 57% of the total value of insolvent debts (NIS 4,250 million)⁸⁴

According to theory⁸⁵ industries that rely mostly on external funds (highly leveraged) and on working capital as their funding sources are predicted to experience FTQ, because of the cyclicity of firms' working-capital (since profits are pro-cyclical) and because of the cyclicity of securitization (i.e. asset prices).

Third, banks' credit to this industry was stagnating in the years before the crisis, and it only revived in 2007 - as fund raising from the non-banks sources declined. In particular it means that the 'capital information' banks had on REC firms did not 'improve' before the crisis (i.e. banks' monitoring of these firms was less active before the crisis). In this connection, banks' new clients (without previous lines of credit and or active lines of credit) 'should' suffer from credit-discrimination due to lack of sufficient capital information on them. Particularly during downturns – when appetite for risks declines. Thus at the industry level, banks did not discriminate new clients from REC industry, as suggested from FTQ theory⁸⁶.

Figure 3.16: Real-estate and construction industry Vs the Financial services Industry: Banks Credit: the percent change in banks' credit to each industry and industry's weight of problematic debts in total problematic debts, 2004-2009.



(1) Balance sheet credit risk of ordinary banking corporations (on a consolidated basis).

⁸⁴ Source: (ISA: "The Credit Crisis 2007/2009: 'Private Bonds market: Arrangement of Creditors", May 2009)

⁸⁵ Romer (1996), as referred by Zilberfarb et al. (2005)

⁸⁶ Due to data limitations the data used here is aggregated at the industry level, i.e. it doesn't say anything on which REC firms received the credit – new clients or known clients. Thus it would be inappropriate to conclude whether banks' credit to REC firms support or contradict the above FTQ hypothesis. All that can be concluded then is that at the industry level, the FTQ hypothesis does not hold (i.e. REC received a bulk of banks' credit although banks credit for REC firms didn't rise in the years before the crisis).

(2) Balances of Doubtful debts ordinary banking corporations (on a consolidated basis).
Source: BoI data: tables D4.1 and D3.1; D4.3 and H16 (April 2010).

And forth, according to BoI/BS (2009, pp 112), a great share of banks' credit to this industry was extended to low ranked firms: out of NIS 190 billion given to REC, 18% (NIS 33.4 billion) went to firms who had issued tradable bonds in December 2008 – so that most of which (NIS 31.6 billions) was given to firms who'd issued bonds with an average yield of 10% and above – firms ranked A or below. This amount of credit was higher than credit extended to all other industries together (with the same rank of A or below).

In sum: the real estate industry was hit the hardest from the crisis, the riskiest, highly leveraged (from non-banks) and had not increased its banking intermediation for years - and yet REC firms had received the highest amount of credit from the banks total credit⁸⁷. So that low ranked firms received a large share of this credit (16.6%).

The rise in banks' credit was accompanied with higher securitization demanded from REC firms, which reduced the level of risk. But its effect on the quality of banks' portfolio was nonetheless negative due to higher credit risk and to centralization risks (i.e. the risks associated with a high share of credit to one industry in banks portfolio).

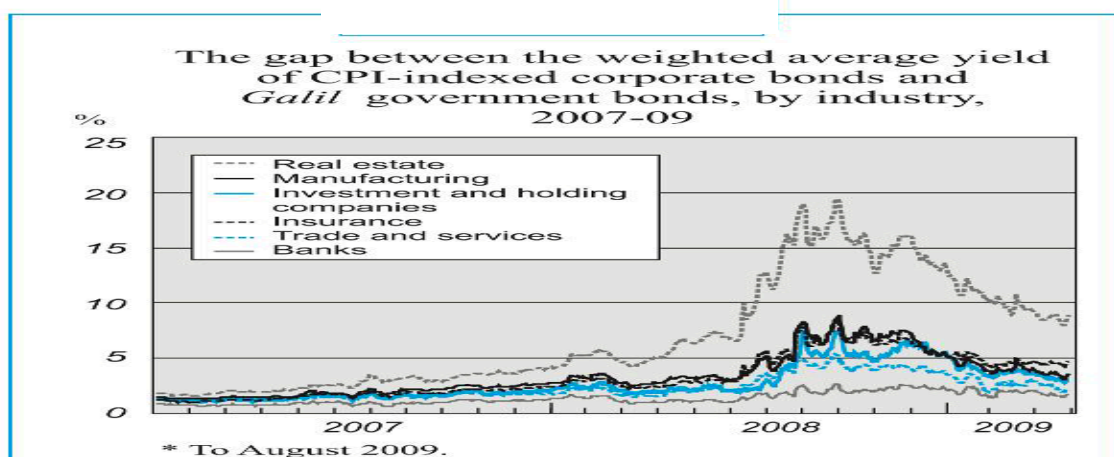
Some citations in the press suggest that most of the credit (70%) went to the six biggest groups in the REC industry. If this is the case, then banks 'generosity' to the REC industry hides the fact that they were simply discriminating SME - within this industry. In other words it supports the first FTQ hypothesis. However, official data - on the size of firms within each industry that received credit - was not available.

Non-Banks' credit

Findings show that among the industries that were hit mostly from the crisis, two of which had experienced excess growth in their spread rates compare to industries that were less damaged: the real-estate industry and the manufacturing industry (which suffered from the decline in demand, see figure 3.17). The spread rates of all industries climbed throughout 2008, and peaked in September – October that year – as the crisis got worse. The rates in the real-estate industry grew as of July 2007 – since the Sub-prime Crisis in the US had affected many of these firms directly.

⁸⁷ Exclude the 'private people' sector which is not considered as an industry, due to "its heterogeneity and because the credit extended to this group highly correlates with total credit in the market", see (BoI/BS, 2009, pp 115).

Figure 3.17: Spread rates of CPI-indexed corporate bonds, by industry, 2007-2009.



Source: the figure is copied from (BoI publications: "Recent Economic Developments [BoI/ReD]: from May until August 2009", pp 11, figure 1.14).

Finally, the following chart summarizes all the findings shown in this subsection, along with the implied conclusions and drawbacks.

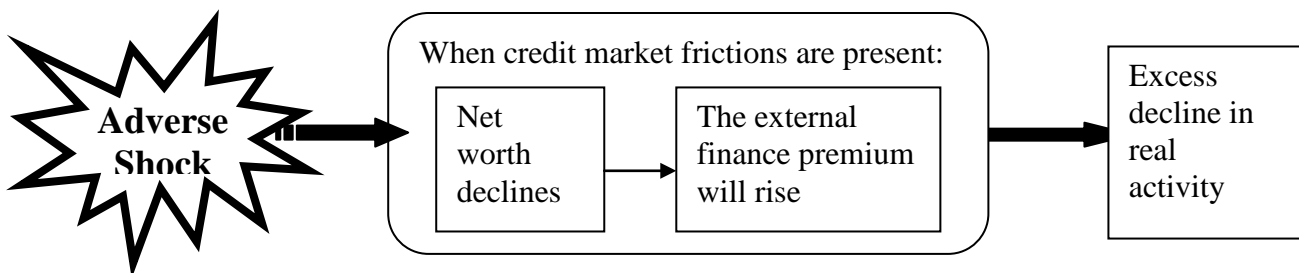
Chart 3.2: summary of the findings on the 'Flight to Quality'			
FTQ hypothesis	Findings	Conclusion/s	Drawbacks
1. The composition of credit extensions will consist of a growing share of 'high-quality' firms and a smaller share of the 'low-quality' firms.	2008: SME received less credit, whereas total credit rose	Support FTQ Credit rationing in 2008.	
	2009: total credit declined but SME's funding limitations remain high	Maybe support FTQ	No formal data
2: Issuances of private placements will decline whereas tradable bonds will not (or decline less).	Issuances of private placements were declined by more than issuances of tradable bonds	Support FTQ	The funding needs of firms that did not issue tradable bonds may have been facilitated through the banks
3. The external finance premium grows such that low-quality borrowers paid more than high-quality borrowers.	Spread rates of A and below bonds rose more than for AA-AAA bonds	Support FTQ	Maybe it was a correction of distorted prices of low-ranked bonds.
	Spread rates of firms without former lines of banks' credit rose by more than for firms with.	Support FTQ	
4: lenders would	Banks' credit to the financial services	Banks' attitude toward the	Data on the size of the firms that received

discriminate industries that in which firms' creditworthiness declined sharply throughout the crisis (i.e. were hit heavily from the crisis): the financial services industry and the real-estate and construction industry (REC).	declined; Banks' credit to the REC industry grew	financial services industry seems to supports the FTQ hypothesis whereas its attitude toward the REC industry does not.	credit within the REC industry may suggest FTQ.
	The spread rates of REC rose more than for all other industries.	Support FTQ	

4. Summary and Conclusions.

This paper's objective was to test how well the theory of the Financial Accelerator can explain the effects of the global financial crisis on the Israeli market. In order to approach this question I set out the theoretical grounds in chapter 1 and described the Israeli economy before the crisis (chapter 2) and throughout the crisis (chapter 3). This chapter reviews the findings while discussing the common line between theory and reality.

The financial accelerator theory predicts that when credit market frictions of asymmetric information are present, the effects of small shocks on real economic activity are being propagated and amplified through time. This mechanism will rise due to adverse changes within the credit markets. In other words:



Moreover, the financial accelerator theory implies that low-quality borrowers will experience the weigh of this adverse mechanism (**Flight to Quality**), and that the real effects of the financial mechanism can be buffered if the economy enjoys a good initial condition (e.g. economic boom) (**Nonlinearity of the Cycle**).

Findings on the Israeli economy before the crisis showed:

1. The Israeli market had high positive growth rates before the crisis, including high GDP, high employment rates and low public deficit. These features helped establishing strong fundamentals as well as policy makers' credibility.
2. Much of the market-frictions within the banking system were reduced in the years before the crisis. Most notable, the conflict of interests between lenders (the public) and intermediators (the banks) was mitigated; and competitive levels had improved. In addition banks' soundness index had improved, indicating the improvement in banks' credit quality and capital adequacy. These features were a result of the structural reforms executed since 2003; the economic boom in the market as well as the strong regulation on banks which contributed to healthy risk management.
3. The non-bank markets grew rapidly before the crisis, such that credit was extended mostly via NBFIs and mainly through bonds ('debt-oriented growth'). This was a result of the structural reforms executed since 2003 as well as the economic boom in those years. The development of these markets improved the competition within the financial sector and raised the availability of credit, mostly for high-quality firms. However, findings showed that this growth embodied some severe market frictions, which were not properly handled. These frictions were facilitated due to loose supervision and inadequate enforcement.
4. The improvement in competition and the credit growth in the credit sector did not benefit SME – their share of credit did not rise, and their funding limitations did not improve. In addition findings suggest that this sector was discriminated against by banks before the crisis.

Given these features of Israeli market, the objective of this paper breaks down to **three questions**: (1) what were the effects of the global shock on non-banks markets, and in comparison to its effects on the banking system? (2) What were the effects of the global shock on real activity? (3) Were there indications for Flight to Quality?

(1) What were the effects of the global shock on non-banks markets, and in compare to its effects on the banking system?

Finding showed that throughout 2008 non-bank markets experienced economic turmoil in which agents' net worth declined and their insolvencies risks grew. Thus credit extensions in these markets declined and their costs grew sharply. As of 2009 non-bank markets recovered and credit extensions revived. The banking system was resilient throughout the crisis, and supplied most of the credit in 2008 (Re-intermediation). In 2009 banks' lending declined.

These findings suggest that the **financial accelerator** mechanism was 'active' within the non-bank markets – where the severe agency problems and conflict of interests found there were driving forces to the turmoil in the non-banks markets. In particular, the relatively frictionless banking system contributed to the banks' resilience by buffering the possibility of similar financial accelerator effects.

*what would happen if? in the absence of the Bachar reform (2005), banks' exposure to capital markets would have been much higher (via provident funds and trust funds) and thus the global shock would have led to severe losses to the system and thus to a general credit crunch – as happened in other economies. Since, in the absence of the reform, the bulk of public's savings was placed at the banks, banks' heavy losses would have triggered bank-runs (in particular given that there is no deposit insurance in Israel). And so according to theory, this would amplify the initial global shock lead the market to a severe recession.

(2) What were the effects of the global shock on real activity?

Overall, the effects of the global financial shock on real activities – production, employment and consumption - were modest and the contraction in GDP lasted for merely two quarters; in particular the Israeli downturn was moderate relative to other economies. In other words, the effects of the global shock have not been amplified – as would have happened if the financial accelerator mechanism was fully active.

This is interesting given the economic turmoil experienced in non-banks: although these markets accounted for almost half of the financial intermediation in 2007, the turmoil did not lead the market to a long and deep recession – as the theory predicts.

As discussed the theoretical scenario was avoided partially because of the markets' initial good state i.e. when the crisis broke, which helped buffering the effect of the crisis ('**Nonlinearity of the cycle**'); partially because of the stabilization actions taken by the authorities – the execution of which was elevated by the credibility gained before the crisis. And partially because of the resilience of the banking system (the Re-intermediation of 2008), indeed if banks were not there to meet the business sector's fund-needs then the turmoil in non-banks may have resulted in a general credit crunch (by definition). This in turn would have adverse implications on real activity and thus deepen the recession.

(3) Were there indications for Flight to Quality?

Several findings had indicated credit-discrimination toward lower-quality borrowers, whereas other findings did not:

First, throughout 2008, banks had discriminated SME while keeping the costs of credit high (Credit rationing). This FTQ indicator was facilitated due to the turmoil in non-banks (i.e. since it expanded banks' pool of borrowers and improved its quality)

Banks' discrimination against SME may have been encouraged by the tightening of regulatory requirement (i.e. raising the capital adequacy), which affect banks' loan-able funds and thus their supply of credit – **as the credit channel predicts**. However testing whether this was an additional channel is not feasible, due to the associated identification problems.

As of the first quarter of 2009, non-banks recovered and credit extensions were renewed, simultaneously banks' credit and its cost declined. This may suggest a decline in the demand for credit, however as business surveys suggests, funding limitation were yet high for small businesses.

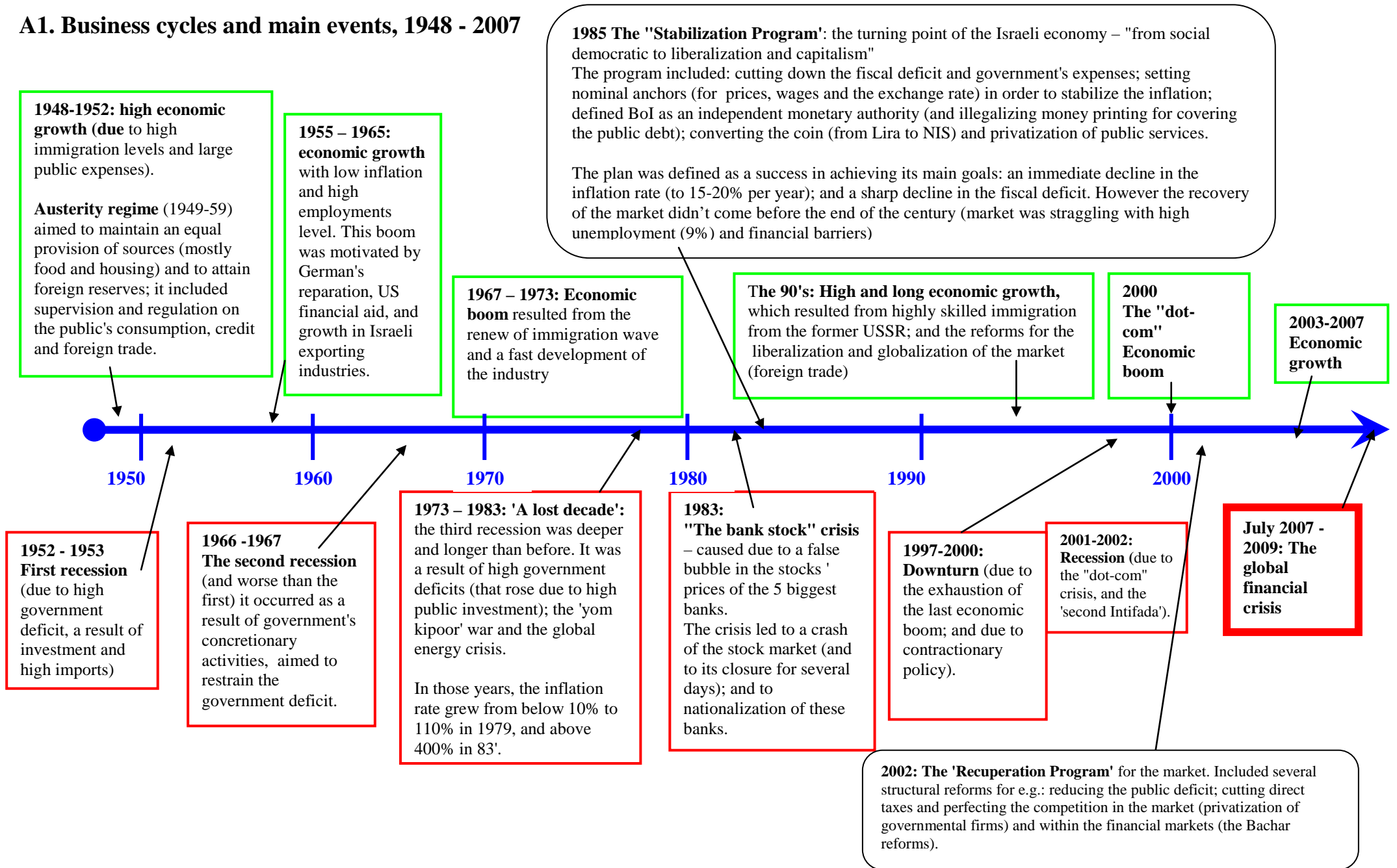
Second, finding showed excess decline in private placements relative to tradable bonds suggesting credit discrimination toward non-public firms relative to public firms.

Third, findings indicated some discrimination toward firms without established lines of bank-credit, compare to firms with established lines of credit as measure by spread rates in the bond market.

And lastly lenders' attitude toward different industries: non-banks attitude toward the REC industry support the FTQ (i.e. their excess rise in bonds' spread rates); Banks' attitude toward the financial services industry supports the FTQ hypothesis (i.e. their excess decline in credit extensions). However, banks' attitude toward the REC industry was **in contrast to several FTQ hypotheses**, namely that credit would decline more for industries that were hit the hardest from the global shock; to industries that are highly leveraged; to industries in which banks' credit extension was stagnating (before the crisis); and to the riskiest firms. Since each of these features imply lower creditworthiness. Some non-formal data suggest that a bulk of banks' credit was extended to **large** construction groups. If this is the case, then banks' attitude toward the REC industry supports the FTQ hypothesis, that banks were discriminating SME (within that industry).

Appendix

A1. Business cycles and main events, 1948 - 2007



A2: Banks' Credit Balance, by Industry, 2007-2008

The ratio between 'yearly expenses from provision to doubtful debts', to total credit balance (percent)		yearly expenses from provision to doubtful debts (NIS million)		Problematic debts (1)					the weight of the industry in total credit balance) (percent)		the change in total credit balance (percent)	Total Credit Balance (NIS million)		Industry
				The share in Total Credit Balance (percent)		percent change	Total Balance (NIS million)							
2008	2007	2008	2007	2008	2007		2008	2008	2007	2008	2007	2008	2008	2007
-1.75	-0.19	-136	-14	6.6	7.2	-3.2%	513	530	0.7	0.7	5.9%	7,775	7,345	Agriculture
0.84	0.36	1,344	526	6.1	6.1	7.5%	9,756	9,075	14.2	13.8	8.1%	159,801	147,841	Manufacture
0.59	0.29	1,119	505	10.9	8.1	44.7%	20,711	14,313	16.9	16.4	8.0%	190,017	175,946	Real-estate and Construction
0.03	0.01	4	1	0.3	0.1	187.5%	46	16	1.2	1.2	12.3%	13940	12411	Electricity and Water
0.44	0.28	407	259	3.8	3.2	19.8%	3514	2933	8.2	8.6	0.7%	92550	91909	Trade
0.27	-0.14	54	-27	18.9	20.7	-6.1%	3722	3964	1.8	1.8	2.8%	19722	19181	Tourism
0.45	0.11	110	23	5.6	3.6	77.0%	1372	774	2.2	2	14.7%	24521	21381	Transportation and Storage
0.59	0.36	140	77	7.2	9.4	-17.0%	1690	2038	2.1	2	9.2%	23597	21609	Communication and Computer services
0.44	-0.1	683	-185	5	1.2	252.0%	7739	2193	13.7	17.3	-17.1%	153910	185679	Financial Services
0.51	0.33	245	140	3.1	2.5	33.0%	1459	1096	4.2	4	10.9%	47679	43012	other services (for businesses)
0.12	0	28	-1	4.6	5.7	-19.1%	1112	1374	2.1	2.3	-0.7%	24121	24301	Public and Community services
0.28	0.23	1007	727	2.1	2.3	3.3%	7518	7281	32.6	29.9	14.4%	365852	319863	Private people
0.45	0.19	5005	2031	5.3	4.3	29.8%	59152	45587	100	100	5.0%	1123485	1070478	Total

Source: (BoI/BS, 2009, pp 111 chart C-4).

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