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Bank Exposure and Sensitivity to the Real Estate Market. Evidence from Cyprus during 2006-2012

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**Neapolis University Pafos
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Bank Exposure and Sensitivity to the Real Estate Market

Evidence from Cyprus during 2006-2012

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Abstract

Banking firms have recently been shifting significantly larger portions of their loan portfolios into real estate. This has caused concern about the continuing economic health of Cyprus banks, since changes in real estate market potentially have a significant impact on bank values and profitability. This scenario is especially critical during real estate crises, when bank losses tend to increase dramatically, placing the entire financial system at risk of collapse, as it was the case in the recent international subprime crisis. Many of the problems in the Cyprus banking sector are home-grown and relate to overexpansion in the property market as consequence of banks' poor risk management practices. Furthermore, the financial sector in Cyprus seems to be vulnerable because of its size relative to that of the domestic economy. The handling of problems in the sector has been complicated by the sensitivity of collateral valuations to property prices, and banks have used certain gaps in the supervisory framework to delay the recognition of loan losses, thus leading to significant underprovisioning. The results point out that the three major banks in Cyprus (The Bank of Cyprus, Laiki Bank and Hellenic Bank) have high exposure to the local real estate market. Having estimated how big the shortfall between property values and their collateral is, this study show that a further decline in property values will begin to result in bank's credit risk and loan restructuring. Conclusion is drawn that there is a positive relation between bank stock returns and real estate market after controlling for general market conditions and interest rates.

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The author wishes to express his love and gratitude to his beloved families; for their understanding, through the duration of his studies.

Declaration

I declare that the work contained in this dissertation is my own original work and that no part has been plagiarised from any source whatever. Where work and ideas have been taken or adapted from other authors, this has been properly cited and referenced.

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Chapter 1

1.1 Introduction

Banks holding large loan portfolios have high exposure, directly or indirectly, to the real estate sector. Lausberg (2004) and Lou Well (2005), suggest the existence of a high concentration of activities and assets of the real estate sector by banks in the U.S., Germany and some Asian countries.

Bank's exposure to the real estate market can be developed either by financing in the real estate industry or by investing in properties. Bank lending has been closely correlated with property prices. From a theoretical perspective, there exists potentially a two-way causality between bank lending and property prices. On the one hand, property prices may influence both demand and the availability of bank credit via various wealth effects. This is mainly related to the role of asymmetric information in credit markets which gives rise to moral hazard or adverse selection problems (see e.g. Bernanke and Gertler, 1989, Kiyotaki and Moore, 1997 and Bernanke, Gertler and Gilchrist, 1998). As a result, the borrowing capacity and credit demand of households and firms are affected by changes in prices of properties, which are often used as collateral for bank lending. Furthermore, property prices affect banks' capital position and thus lending capacity, both directly through valuations of their holdings of real estate assets and indirectly via changes in non-performing loans. The latter may rise as falling property prices affect the solvency and, potentially, the willingness to repay of households and corporate borrowers. On the other hand, credit conditions may also affect asset valuations, as increases in credit availability may expand the demand for a (temporarily) fixed supply of properties.

Property (also known as real estate) is one of the main investments assets. Thus, investors in property, particularly financial institutions (banks), have to take into account the characteristics of the various assets classes and the linkages among them. Data to analyse the property investment market are much more limited than in the share and bond markets. Therefore, the main focus is on the consideration of property in a portfolio perspective rather than at individual building level.

The default risk of a property investment is depends on the quality of tenant in the same way the default of risk of a bond depends on the issuer. It has traditionally been argued that the

property has a more secure income than shares as rent has to be paid, even if the company occupying the building is making a loss, while there is no such obligation to pay a dividend to holders of shares. Further, if the occupier goes bankrupt, it is possible to find another tenant, whereas if a company goes bankrupt, the shareholders lose part or all of their money.

Property, like shares, has no maturity and is traded on a secondary market. According to Hoesli M. and Macgregor (2000), capital value of property may rise and fall in both nominal and real terms depending on actual cash flows, on future expectations of growth and inflation, and on the discount rate.

Under the standards asset pricing model, the price of real estate depends on the discounted present value of its expected rents. Supply in the real estate market is relatively inelastic given the long construction lags and the fixed supply of land. Consequently, rents are typically seen as largely demand driven, depending on variables such as real GDP, and anticipated real interest rates, which captures the cost of borrowing. Other relevant variables include real estate taxes and mortgage interest rate deductibility, the regulatory framework for the real estate market such as zoning and building code restrictions, tenancy and lease laws, etc. In the meantime, it is generally accepted that, as prices move further and further away from their fundamental value, more and more investors would eventually move to sell their properties. As this process gathers momentum, prices may drop dramatically.

Additionally, price in property market is not determined by the interaction of many sellers and many buyers for a homogeneous investment in a central market, such as share in a company or a gift of a particular issue, to produce market clearing price. Price, therefore, is the product of negotiation between the seller and one or more buyers for unique properties in local markets.

The performance of real estate reflects property market performance. On the other hand, the performance of stock market in the economy reflects underlying corporate performance. Based on Liow K.H publication (2004), for financial institutions, property is both a factor of production and an asset. In good times, corporate growth in profitability (with higher share prices) leads to corporate expansion which further leads to rising rental level given increased demand and short-run supply inelasticity. Rising rents lead to higher capital values in the property markets and hence raise net asset values anticipated in the stock prices. In a recession, the reverse process happens. However, in the longer term, rising rents and capital values of real estate might increase the cost of capital of the companies. Coupled with other

possible speculative development activities and bank lending on real estate, one likely scenario is that higher returns to real estate are associated with low (negative) returns to the corporate sector and vice versa. Hence, real estate and stock markets can be related both in long-term and short-run in different manners.

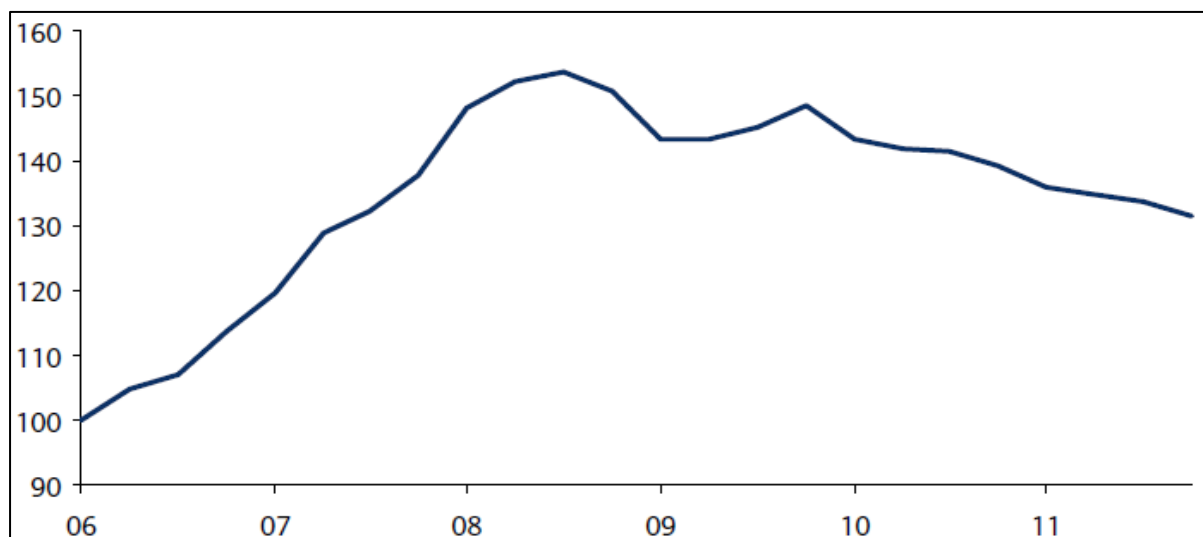
1.2 Evidence from Cyprus during 2006-2012

The experiences of Cyprus during 2006-2012 offer a useful case study of the nexus between bank exposure, property prices and economic activity for a number of reasons.

First, easy credit access in Cyprus Banks resulted in rapid credit growth and then to a real estate bubble. According to data released by the Central Bank of Cyprus (2012), residential property prices surged 53.7% between Q1 06 and Q3 08. At end-2011, Cyprus house prices were 14.5% down on their Q3 2008 peak (-20.5% in real terms). This year the housing market is expected to suffer yet more, due to the ongoing recession.

Figure 1

Residential Property Price index



Period 2006-2012

Source: Central Bank of Cyprus 2012

According to Department of Lands and Surveys (2012), sales continue to decline in all districts, despite government efforts to provide more consumer protection for homebuyers. Domestic sales reduced 13% from April 2011 to April 2012.

Nowadays, high interest rates on housing loans and strict lending criteria make access to credit even more difficult. More specifically, according to Residential Property Price Index published by Central Bank of Cyprus (2012), the interest rate on housing loans increased to 5,4% in the first quarter of 2012, compared to 5% in the first quarter of 2011. In addition, in February 2012, the average lending rate for loans up to 1 year increased to 6.76%.

In parallel with the increase in interest rates, the lending criteria for housing loans, as published in the CBC Bank Lending Survey (2012), were tightened during the first quarter of 2012.

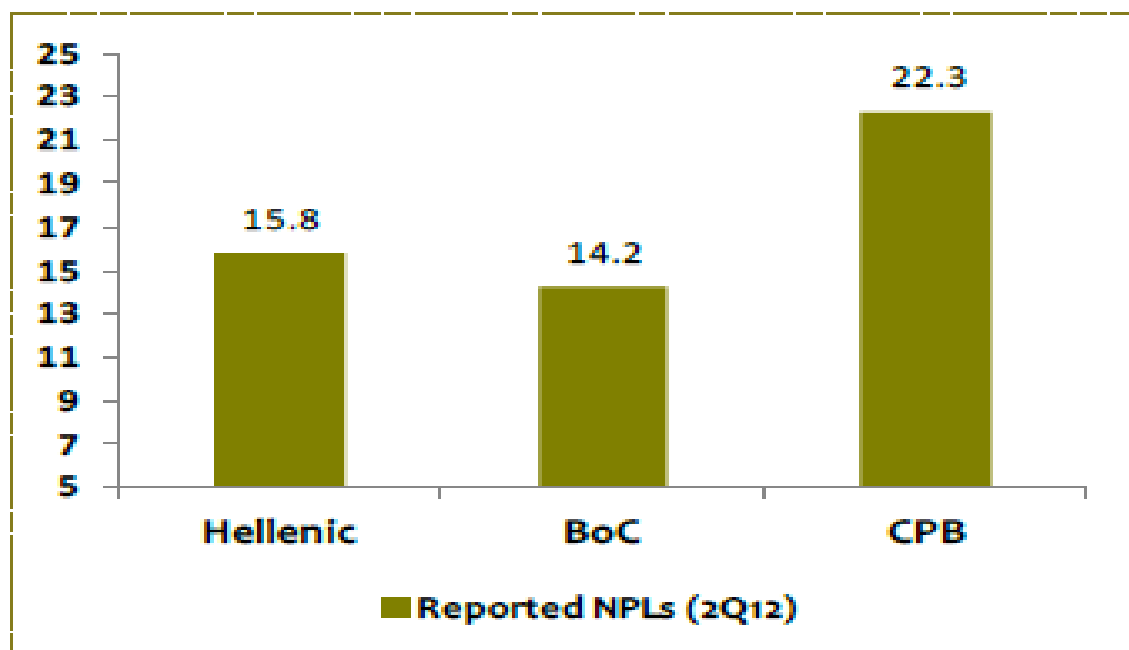
Second, historically, Cyprus's banking sector has considered being oversized relative to the economy. Further, Cyprus Banking System is recently posed risks on the back of its low capitalisation, asset quality and profitability. The landscape is dominated by the three largest banks (The Bank of Cyprus, Laiki Bank and Hellenic Bank) with a total market share (as a percentage of total assets) of approximately 60% (according to Central Bank of Cyprus, Annual Report 2011).

Third, the banking sector recently experienced severe capital shortfalls as a consequence of banks' exposure to the real estate sector. Based on a publication about Cyprus: *PSI can be avoided with future ESM intervention prepared by the Corporate and Investment Banking division of Barclays Bank PLC* (2012), 47% of all loans to non-Monetary Financial Institutions in Cyprus are directed to the real estate sector (c.EUR22.9bn).

Of this, 22.1% are to the construction sector (c.EUR5bn), 22% to real estate activities, and 55% to mortgages (EUR12.7bn). The risk profiles of these categories are completely different. Commercial real estate is by far the riskiest segment in banks' portfolios. The Non Performing Loans (NPL) ratio for this sector reached 28% in September 2010 from 2.0% in September 2008 and is likely to have increased further more recently due to the intensifying economic recession.

While there are no available data for the NPL ratio in the residential real estate loans, it is believed that should be considerably lower, yet above other euro area economies. In fact, the overall NPL ratio at the three largest banks in Cyprus is well above 10%.

Figure 2

NPLs in the residential real estate loans – Major Cypriot Banks

Source: Bank's Financial Presentations. (Q2-2012)

The question that arises is how a loan becomes non-performing. The answer "it depends" would apply to Cyprus - non performing loans under the Cyprus Central Bank's definition are all loans for which the borrower is not paying their loan interest for more than 90 days and which are not sufficiently covered by collateral. Thus, if someone has a 100,000 loan on his property and he is not paying it, but the property is worth/valued at 150,000 then the property is termed as being "performing". The result of course is that non -performing loans are under reported - they currently stand at circa 12-14%, even if the actual number of loans going more than 90 days without interest being paid could be more than 25%.

From the European Commission and International Monetary Fund (IMF) perspective, a non-performing loan is a loan that has not been serviced in 90 days but is fully secure. This would immediately raise the amount needed for the banks' recapitalisation. There are also the loans backed by shares and property, whose current values are lower than when the agreement was made. Former President George Vasiliou (2012) says if provisions are made for all of these, several more billions would be needed and "you are simply making sure that Cyprus would never recover."

Fourth, financial indicators suggest that banks' balance sheets and profitability were affected by the downturn in economic activity and the collapse in property prices. These include an increase in the mortgage delinquency rate and in classified loans, and declines in bank profitability. The three major banks in Cyprus have been particularly hard hit. The international experience suggests that falling property prices often played a central role in triggering banking crises (IMF, 2000). In particular, it is frequently argued that financial deregulation and growing competition induced banks to become increasingly engaged in mortgage financing. As a result, the banking sector played an "accelerator" role in the run-up of property prices, but was also exposed to the disruptive impact of the subsequent price decline.

The results suggest that banks holding large loan portfolios have high exposure, directly or indirectly, to the real estate sector. This raises the question of how banks management responded to the large exposure in the real estate sector during the last years.

A dramatic drop in real estate prices tends to result in greater awareness by banks of the perceived risks of real estate loans. For these reasons, it is very likely that a significant decrease in bank's equity will occur. Added to this, supervisors and regulators react to this scenario of reduced bank equity with additional requirements of solvability and more stringent rules for the risk evaluation and provisioning for bad loans of real estate assets. According to the Wall Street Journal (2012), European banks are expected to increase the volume of commercial real-estate assets they bring to market as they prepare for new European Union capital requirements. Banks are under pressure to reduce their property portfolios further under increased regulation. The so-called Basel III rules, which take effect next year, require banks to hold more capital against loans secured on commercial property. These measures result in a further reduction in the bank credit magnifying the downfall movement in real estate prices. This seems to be the mechanism of transmission between real estate market conditions and bank profitability.

Investing in properties can make the bank's asset portfolios riskier. There is a number of risk characteristics that differentiate real estate investments from alternatives such as common stock and corporate bonds. Banks, by investing in properties, could be exposed to many investment risk characteristics. According to Brueggeman W.B and Fisher J.D. (2011), one of the major property investment risks is the liquidity risk. This risk occurs when a continuous market with many buyers and sellers and frequent transactions is not available. The more

difficult an investment is to liquidate, the greater the risk that a price concession may have to be given to a buyer because the seller have to dispose of the investment quickly. Furthermore, real estate is subject to numerous regulations such as tax laws, rent control, zoning, and other restrictions imposed by government. Legislative risk results from the fact that changes in regulations can adversely affect the profitability of the investment. Managements risk is also an important element. Most real estate investments require management to keep the buildings maintained to preserve the value of the investment.

1.3 Research aim and objectives

The aim of this research is to show that when property price decreases, it brings about a reduction in bank equity, as a consequence of the reduction in the value of the real estate asset portfolios held by banks, and by the corresponding reduction of collaterals.

The objectives of this research are as follows:

1. To explore the degree of linear-correlation between bank stock returns and real estate market returns.
2. To measure the bank asset exposure to the real estate market
3. To find how big is the shortfall between property values and their collateral

The remainder of the article is organized as follows. In section 2 we present a review of the previous literature and main empirical findings. The methodology and sample are discussed in section 3. The empirical results are presented and discussed in section 4. The conclusions appear in section 5.

Chapter 2

2.1 Literature Review

The most studies looking at the importance of bank stock returns in relation to real estate values are almost completely look at the US market.

The majority of studies use a two factor risk model, which indicates that bank stocks are not influenced only from real estate market but in general from general market conditions. In instance, Flannery and James (1984) and Viale et al. (2009) found that there is a negative relation between the change in interest rates and bank returns.

In contrast, Allen, Madura and Wiant (1995) indicate that there is a positive relationship between monthly bank returns and the real estate index, the sensitivity of bank values to the real estate market has increased over time and the bank-specific sensitivity is positively related to the bank's balance sheet exposure to real estate. However, the same authors argue that the value of banks react significantly to real estate market conditions when: (1) banks have a significant exposure to the real estate sector; and (2) the exposure is significantly influenced by changes in the conditions of the real estate sector.

Studies looking the behaviour of bank share prices have tended to focus only on market risk and interest rates (see for example, Viale *et al.* 2009). However, the Asian financial crisis and more recently the subprime mortgage crisis highlighted the importance of the real estate risk.

According to Bryant C.W. (2012), in USA, the drastic increase in the number of defaults and foreclosures on subprime mortgages beginning in 2006 led to a subprime mortgage crisis. By 2008, the overall losses from subprime mortgages reached about \$250 billion. And, due to the complex repackaging of subprime mortgages into investments, this crisis in the housing market contributed to a financial meltdown in 2008 that contributed to a national economic disaster.

Herring and Wachter (1999) and Lu and So (2005) state that, before these crises, there was a tendency for over-investment in the real estate sector due to the high returns associated with this type of investment, potentially driving the occurrence of speculative bubbles in real estate prices in the vast majority of these markets. Furthermore, the increase in real estate

prices tends also to bring about an increase in the value of collaterals, resulting in a perceived lower risk by the lender. For these reasons, the increase in real estate prices tends to produce increasing bank credit granting, which in turn, leads to new further rises in real estate prices.

The coincidence of cycles in bank credit and property prices have been widely documented in policy oriented literature (IMF, 2000 and BIS, 2001). However, little formal empirical research has focussed on the interaction between the two. Most studies rely on a single equation set-up, focussing on bank lending or property prices. Goodhart (1995) finds that property prices significantly affect credit growth in the UK but not in the US. Borio and Lowe (2002) show that the deviation of aggregate asset prices from their long-run trend, combined with a similarly defined credit gap, is a useful indicator of the likelihood of financial distress in industrialised countries. Collyns and Senhadji (2002) find that credit growth has a significant contemporaneous effect on residential property prices in a number of Asian economies.

2.2 Studies show a greater sensitivity in Small Banks

The level of sensitivity in the real estate market depends on the bank's value. Mei and Lee (1994) and Mei and Saunders (1995) found that in the US, a greater sensitivity to the real estate sector is prevalent in small banks. On the other hand, large banks are perceived as safer because, ultimately, they would be bailed out by governments (see O'Hara and Shaw, 1990). This may be due to the fact that small banks have less risk-analysis tools and less ability to diversify risk. Thus, with other things being equal, for different levels of real estate holdings, larger banks should have a lower sensitivity to the conditions in the real estate market.

2.3 Correlation between property and shares

For Switzerland, Hoesli and Hamelink (1997) compute correlation coefficients between Geneva apartment buildings, Zurich apartment buildings and Swiss stocks for the period 1981-91. These results suggest that the returns on apartment buildings are correlated with the returns on shares, a result which is consistent with that reported for commercial property. Thus, the correlation coefficient between property and shares is usually positive.

Chapter 3

3.1 Methodology

The literature reviewed above shows the existence of a close relationship between bank stock returns and the real estate industry. However, no direct analysis was conducted in order to test the sensitivity of banks with respect to the real estate conditions in Cyprus.

To carry out the degree of linear-correlation between bank stock returns and real estate market returns, a linear regression analysis was used.

Furthermore, it is used a quantitative analysis to measure bank asset exposure to the real estate market as well as to find the degree of shortfall between property values and their collateral.

Having in mind the Bank's exposure to the real estate sector, the hypothesis is that when property values show a downward direction (after controlling for general market conditions), it will begin to result in a number of borrowers going into negative equity since banks used the actual value of the properties as collateral to grant the various housing loans. Thus, given that the value of collateral has an impact on the value of loans and mortgages, the potential loss to bank stock returns as a result of default (credit) risk is inversely related to the value of the collateral.

The approach is to demonstrate the validity of this hypothesis, which will confirm the reasonable link between bank stock returns and real estate returns.

The data used are as follows:

- Cyprus Stock Exchange Banks Historical index, for the period 1/1/2006 to 1/7/2012.
- Cyprus Central Bank's (CCB) Residential Property Price index, for the period 2006 Q1 to 2012 Q2

According to Central Bank of Cyprus (2012) the residential property price indices for Cyprus are constructed by the Central Bank of Cyprus's Real Estate Unit (REU), which is part of the Economic Research Department, in collaboration with the member banks of the Association

of Cyprus Banks. The indices are based on property valuation data collected since 2006 by the contracted banks, which receive the relevant information from independent property surveyors in connection with mortgage transactions, such as housing loans, mortgage refinancing and mortgage collateral. The data, which are representative of the Cyprus property market, cover all the areas under the effective control of the Republic of Cyprus (Nicosia, Limassol, Larnaca, Paphos and Famagusta) and refer to residential properties (houses and apartments). The base period for all the indices is the first quarter of 2010 (i.e. 2010Q1=100).

3.2 Purpose of regression analysis

The use of linear regression analysis in this study is to develop a mathematical model to explain the variance in the dependent variable based on values of independent variables. Suppose that banking industry returns, R_a , is ‘driven by’ real estate returns, R_b . As a result, R_a is the dependent variable and R_b the independent variable.

Then, the hypothesized relationship between R_a and R_b may be written,

$$R_a = \beta_0 + \beta_1 \times R_b + e$$

Where,

β_0 parameter = a constant amount;

β_1 parameter = the effect in bank stock returns as a result of an increase in property prices, hypothesized to be positive (coefficient of the variable R_b); and

e = the “noise” term reflecting other factors that influence banking industry returns.

The data set contains observations for R_a and R_b . The noise component e is comprised of factors that are unobservable, or at least unobserved. The parameters β_0 and β_1 are also unobservable. The task of regression analysis is to produce an *estimate* of these two parameters, based upon the information contained in the data set.

To understand how the parameter estimates are generated, note that if the noise term e is ignored, the equation above for the relationship between R_a and R_b is the equation for a line, a line with an “intercept” of β_0 on the vertical axis and a “slope” of β_1 .

3.3 Quantitative analysis

Quantitative method is a research method used to collect data objectively employing structured procedures. In accordance with Naoum S. (1999), quantitative research methods are appropriate in the following situation:

- When you want to find facts about a concept, a question or an attribute.
- When you want to collect factual evidence and study the relationship between these facts, in order to test hypotheses.

(Naoum S. 2006)

Example of quantitative analysis includes ratio analysis. In this study, a loan to value (that banks used as collateral) ratio analysis is used to investigate the degree of shortfall between property values and their collateral.

Based on the data from the Cyprus Central Bank’s (CCB) Residential Property Price index, for the period 2008 Q1 – 2012 Q2, loans granted over the recent years had varying requirements in relation to property values. In particular, the maximum allowable Loan-to-Value (LTV) ratio was 80% for primary residence and 70% for a second home.

The actual value of the properties that banks used as collateral to grant the various housing loans is unknown, but the Cyprus Central Bank provides a breakdown of the amount of housing loans outstanding per quarter. Whilst it is not certain as to the ratio between property value and loan amount, it would be reasonable to assume that most loans would be at the limit of the allowable ratio, i.e. the loan would be 80% of the value of the property. Thus, in order to calculate the hypothetical Market Value of the collateral, it is assumed that these loans are 80% of the properties’ values.

Having calculated the value of the collateral, property values have been adjusted according to the movement of house prices over the period (the ratio between loan and value may have been 80% at the time of granting the loan, but as property values have decreased, this ratio must have increased). In order to be consistent, it is used the CCB’s residential price index to

make these adjustments. Then it is recalculated the ratio between loan amount and property value in order to see how this has changed.

Additionally, to measure bank asset exposure to the real estate market, the following proxies are used: Real Estate Holdings/Equity; Real Estate Holdings/Assets; Real Estate Loans/Equity and Real Estate Loans/Assets, based on Allen *et al.* (1995). Bank's real estate holdings are obtained in the annual reports of each bank.

The procedure adopted was the following: a list of financial statements has been obtained of the most recent annual reports (2010-2011) of the three largest banks (The Bank of Cyprus, Laiki Bank and Hellenic Bank) and then foresaid proxies/ratios have been calculated.

Based on the procedure followed by Allen *et al.* (1995), the value of total asset exposure to real estate for each bank is the sum of mortgage loans ("*Real Estate Loans*") and the direct investments in real estate assets. It is worth noting that, based on Bank of Cyprus annual report (2011), the real estate assets (mortgage loans) are revalued annually by the banks using market prices by independent, professionally qualified valuers with adequate and relevant experience on the nature and the location of the property.

Chapter 4

4.1 Empirical Results

4.2 Sensitivities of Bank Returns to Real Estate

Table 1 shows the Residential Property Price Index, as given by Cyprus Central Bank, for the period 2006 Q1 to 2012 Q2.

| Year | Quarter | Residential Property Price Index | Residence by type | | Residence by type and district | | | | |
|------|---------|----------------------------------|-------------------|--------|--------------------------------|----------|---------|--------|-----------|
| | | | Flats | Houses | Nicosia | Limassol | Larnaca | Paphos | Famagusta |
| 2006 | Q1 | 69.3 | 74.6 | 66.0 | 71.7 | 64.7 | 66.2 | 84.3 | 60.3 |
| | Q2 | 72.8 | 75.3 | 71.2 | 73.1 | 67.3 | 70.4 | 86.2 | 67.6 |
| | Q3 | 74.3 | 77.9 | 72.1 | 74.5 | 71.2 | 66.5 | 85.9 | 71.7 |
| | Q4 | 79.2 | 83.3 | 76.3 | 79.5 | 72.8 | 81.7 | 86.1 | 73.8 |
| 2007 | Q1 | 83.1 | 84.5 | 82.2 | 82.8 | 75.8 | 82.3 | 88.6 | 82.9 |
| | Q2 | 89.4 | 89.1 | 89.6 | 90.1 | 82.2 | 87.9 | 90.8 | 89.2 |
| | Q3 | 92.5 | 93.8 | 91.3 | 91.2 | 88.0 | 93.2 | 93.1 | 90.6 |
| | Q4 | 95.9 | 97.5 | 94.7 | 91.0 | 91.1 | 99.3 | 98.5 | 98.7 |
| 2008 | Q1 | 103.8 | 104.4 | 103.2 | 103.0 | 99.7 | 103.6 | 99.7 | 102.9 |
| | Q2 | 106.4 | 104.6 | 107.9 | 104.3 | 103.5 | 104.9 | 99.9 | 100.6 |
| | Q3 | 106.9 | 104.4 | 108.9 | 106.9 | 103.2 | 104.3 | 102.5 | 113.4 |
| | Q4 | 105.0 | 105.8 | 104.3 | 104.4 | 106.6 | 100.0 | 102.4 | 108.9 |
| 2009 | Q1 | 99.7 | 100.9 | 98.8 | 99.7 | 95.6 | 99.4 | 103.7 | 108.3 |
| | Q2 | 99.4 | 96.8 | 101.2 | 100.8 | 93.7 | 99.3 | 104.1 | 106.0 |
| | Q3 | 100.8 | 101.0 | 100.6 | 101.1 | 96.7 | 103.4 | 102.6 | 101.1 |
| | Q4 | 102.7 | 102.1 | 103.0 | 100.2 | 101.5 | 103.0 | 101.6 | 102.3 |
| 2010 | Q1 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| | Q2 | 99.4 | 98.6 | 100.0 | 99.2 | 99.5 | 99.5 | 99.9 | 98.6 |
| | Q3 | 99.0 | 97.3 | 100.4 | 99.9 | 98.0 | 98.4 | 99.8 | 98.2 |
| | Q4 | 98.7 | 96.7 | 99.9 | 99.9 | 97.6 | 97.9 | 98.3 | 98.4 |
| 2011 | Q1 | 96.9 | 94.0 | 99.1 | 99.6 | 95.6 | 96.1 | 94.7 | 92.5 |
| | Q2 | 96.0 | 93.2 | 98.0 | 99.3 | 94.4 | 93.9 | 92.4 | 94.3 |
| | Q3 | 94.8 | 92.2 | 96.5 | 98.6 | 93.7 | 92.4 | 89.6 | 91.8 |
| | Q4 | 93.1 | 90.4 | 94.7 | 97.4 | 92.3 | 90.4 | 87.3 | 90.1 |
| 2012 | Q1 | 92.1 | 89.9 | 93.7 | 96.5 | 91.8 | 89.4 | 84.7 | 87.9 |
| | Q2 | 90.3 | 88.4 | 91.6 | 95.0 | 90.3 | 86.4 | 85.7 | 83.9 |

Market dynamics had pushed prices to a very high level. However, over the recent four years, due to the recession in the real estate market, demand and investments have been drastically reduced causing property values to show a downward trend.

Table 2 presents the summary of the Cyprus Stock Exchange banks index. In particular, the Banks index CSE daily and quarterly returns for the period 2006 Q1 to 2012 Q2, as well as the residential property quarterly returns.

| Daily Returns | Year | Quarter | Banks stock | Residential Property |
|---------------|------|---------|--------------|----------------------|
| | 2006 | Q1 | 0.006130045 | n/a |
| 0.018749 | | Q2 | 0.002117133 | 0.048257221 |
| 0.001323 | | Q3 | 0.000830867 | 0.020376892 |
| 0.023369 | | Q4 | 0.004706119 | 0.064392335 |
| 0.009199 | 2007 | Q1 | 0.001254902 | 0.048075752 |
| -0.01554 | | Q2 | 0.001914197 | 0.073513409 |
| 0.022373 | | Q3 | 0.000662951 | 0.033285928 |
| -0.00987 | | Q4 | -0.000390479 | 0.03685891 |
| 0.005662 | 2008 | Q1 | -0.008855186 | 0.07839587 |
| 0.009982 | | Q2 | -0.000520649 | 0.025033914 |
| 0.024175 | | Q3 | -0.004740009 | 0.005217043 |
| 0.023111 | | Q4 | -0.011077836 | -0.0186414 |
| 0.003854 | 2009 | Q1 | -0.002833753 | -0.05185175 |
| 0.012828 | | Q2 | 0.007636543 | -0.00238401 |
| 0.004195 | | Q3 | 0.004186824 | 0.013387261 |
| 0.011483 | | Q4 | -0.001974336 | 0.018718207 |
| 0.037354 | 2010 | Q1 | -0.001053964 | -0.02637426 |
| -0.00445 | | Q2 | -0.005810029 | -0.00603404 |
| -0.01248 | | Q3 | 0.002524524 | -0.00368136 |
| 0.043512 | | Q4 | -0.002702141 | -0.00358715 |
| 0.021629 | 2011 | Q1 | -0.001312315 | -0.01813732 |
| -0.01554 | | Q2 | -0.003887666 | -0.00905345 |
| -0.03274 | | Q3 | -0.008518865 | -0.0130702 |
| 0.003516 | | Q4 | -0.007368441 | -0.01827536 |
| 0.002053 | 2012 | Q1 | -0.003054451 | -0.01007982 |
| 0.007701 | | Q2 | -0.01068434 | -0.01978146 |

Using RATS Econometrics Software

Table 3 Linear regression analysis results

| Regression Analysis | |
|--|----------------|
| Adj. R² | |
| <u>Total Period 2006-2012</u> | |
| R² = 13% of the movement of bank stock returns was due to real estate market | |
| β_0 parameter | = -0.002503353 |
| β_1 parameter | = 0.051532239 |
| Standard Error | = 0.0046 |
| <u>Period 2006-2007</u> | |
| R² = 43% of the movement of bank stock returns was due to real estate market | |
| β_0 parameter | = -0.001149985 |
| β_1 parameter | = 0.057425981 |
| Standard Error | = 0.0014 |
| <u>Period 2006-2008</u> | |
| R² = 20% of the movement of bank stock returns was due to real estate market | |
| β_0 parameter | = -0.004080714 |
| β_1 parameter | = 0.074234332 |
| Standard Error | = 0.0046 |
| <u>Period 2009-2012</u> | |
| R² = 12% of the movement of bank stock returns was due to real estate market | |
| β_0 parameter | = -0.001398541 |
| β_1 parameter | = 0.1016801 |
| Standard Error | = 0.0048 |

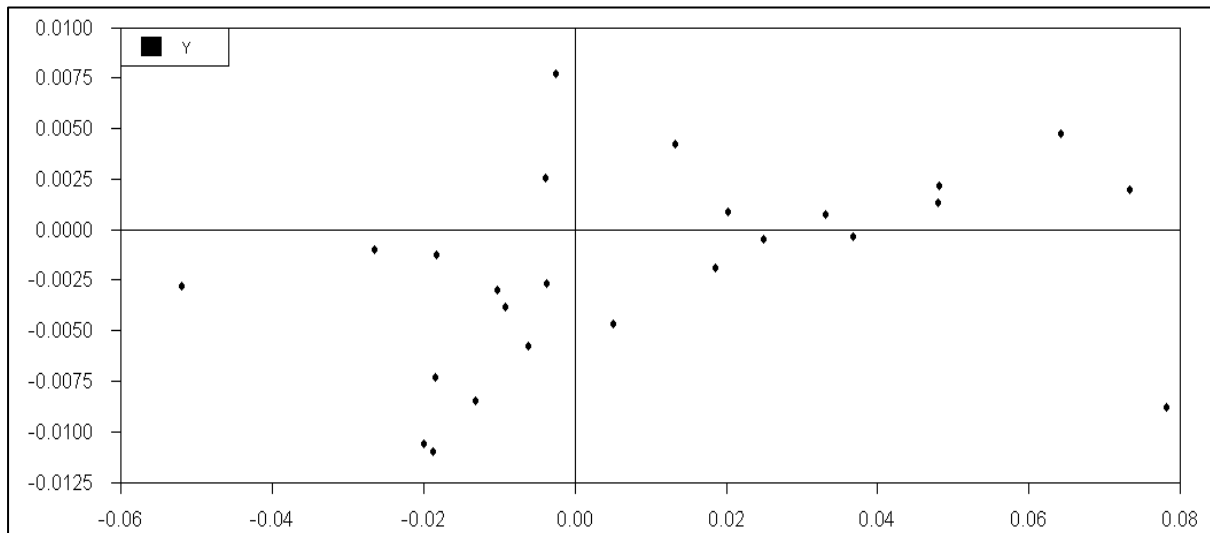
Tables 3 show the R² as defined by equation above. The estimated regressions for the different time periods aim to test the robustness of the results over different periods of time.

The standard error of the estimate represents the square root of the sum of the squared regression residuals divided by the degrees of freedom.

As mentioned above, easy credit access in Cyprus Banks resulted in rapid credit growth and to a real estate bubble. This is especially happened during the period 2006-2007 where most real estate loans were given to borrowers. The above Table 3 reports the results for R^2 from 2006 to 2012. An important concluding remark is that the degree of linear-correlation of variables was higher when real estate prices followed an upward trend during the period 2006-2008. Therefore, the higher exposure to real estate market leads to higher sensitivity in the equity of banks. On the other hand, during the period 2008-2012, the borrowing capacity and credit demand of households and firms are affected by changes in prices of properties, and for that reason the degree of linear-correlation of variables was lower.

Figure 3

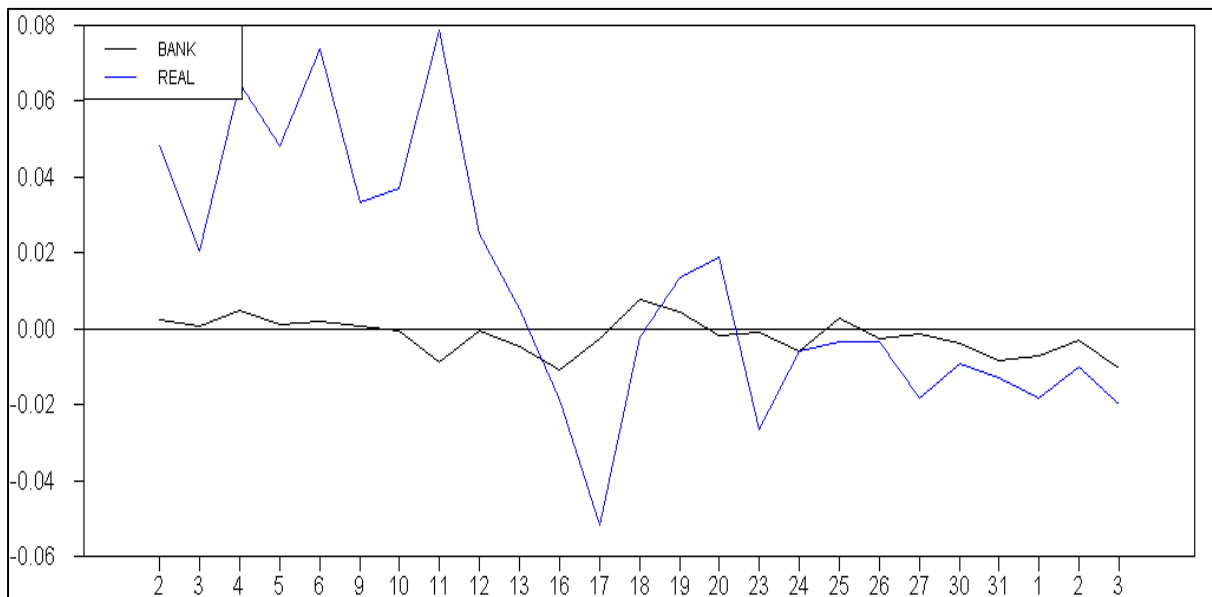
Two-dimensional diagram – Dependent variable



The above figure presents all the individuals of the dependent variable. The information presented in a two-dimensional diagram, conventionally termed a “scatter” diagram. Each point in the diagram represents an individual.

Figure 4

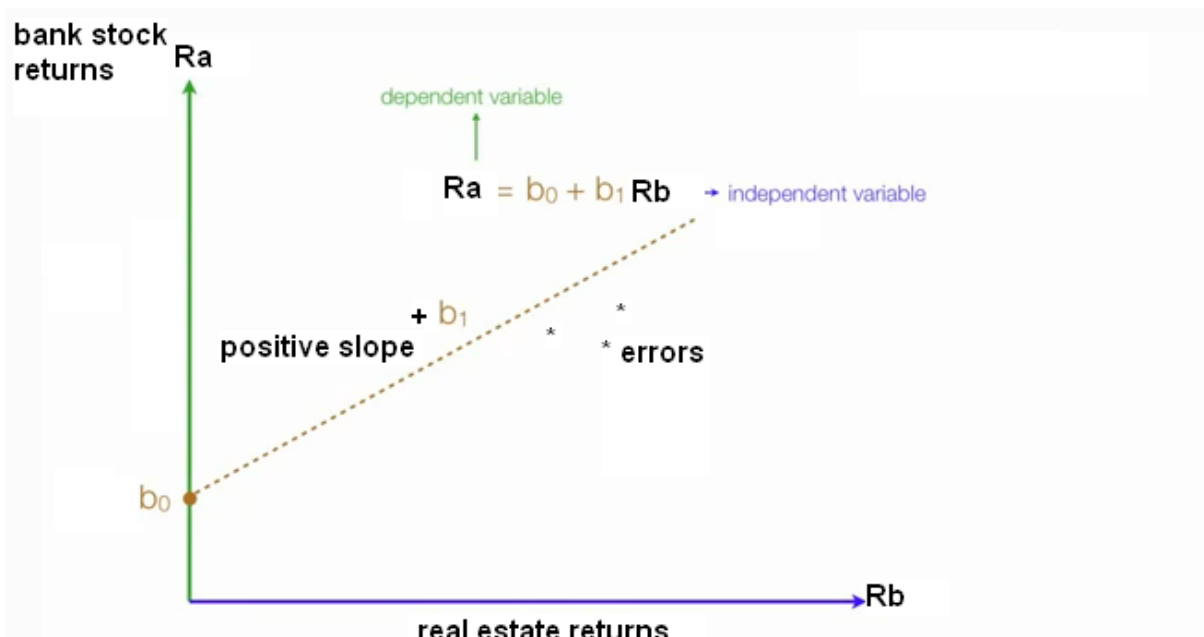
Degree of linear-correlation between bank stock returns and real estate market returns



The above graph (Rats) presents a positive relationship between Bank and Real estate returns. From Figure 4 it can be seen that the real estate market recession has been reflected to bank stock returns.

Figure 5

Independent and dependent variable move in the same direction



The above Figure 5 shows that independent and dependent variable move in the same direction. Therefore, as property market shows an upward direction, bank stock return should go up. The slope of the line is β_1 and β_0 is the intercept (the value of R_a when $R_b = 0$). The results show that for period 2006-2012, β_1 still always positive. The first point to note is that the higher percentage in terms of the positive correlation between bank stock returns and real estate returns was in 2006-2008 by approximately 7%.

In this case, bank's managements, could control, manipulate or change the independent variable in order to minimize the errors and the difference between the estimated and actual value. The point is to minimize the errors and make them as small as possible. In achieving this, bank's managements should minimize the exposure to the real estate market.

In summary, the results presented suggest that Cyprus banks had a great sensitivity to real estate market risk since real estate and stock market are positively correlated.

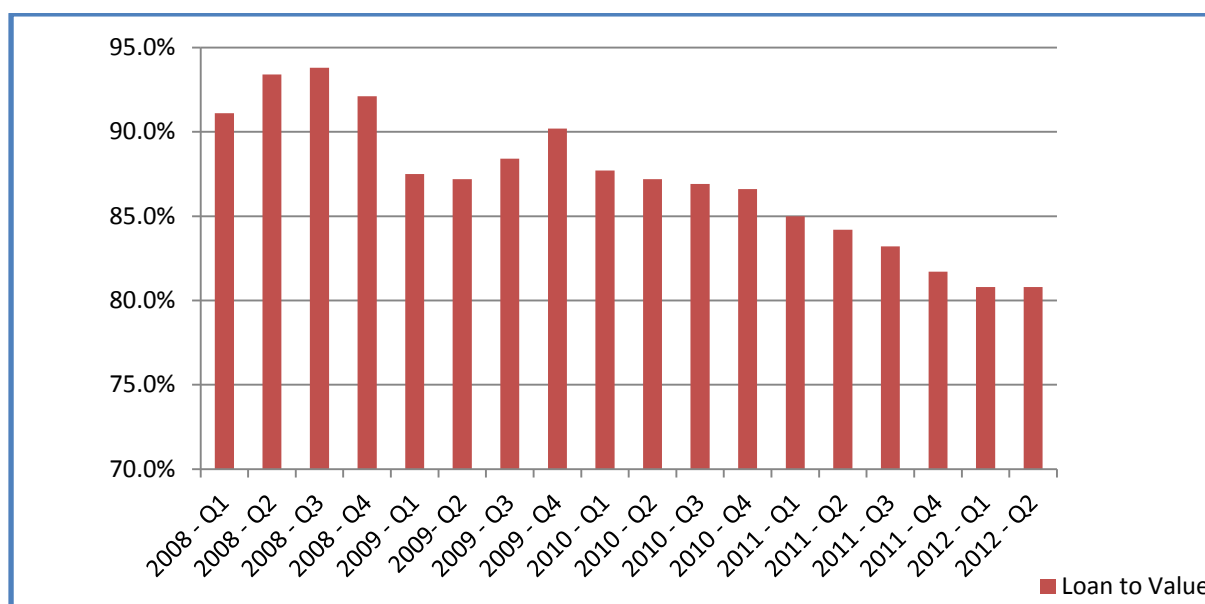
4.3 The degree of shortfall between property values and their collateral

Table 4

Price decreases based on Cyprus Central Bank Data (2012)

| | Property Value (Based on CCB property price index) | Loan amount (80% of property value) | Variation from current property prices | Collateral to Value (CTV) (Based on current prices) |
|-----------|--|---|--|--|
| 2008 - Q1 | 100.0 | 80.0 | -12,2% | 91,1% |
| 2008 - Q2 | 102.5 | 82.0 | -14,3% | 93,4% |
| 2008 - Q3 | 103.0 | 82.4 | -14,7% | 93,8% |
| 2008 - Q4 | 101.2 | 80.9 | -13,2% | 92,1% |
| 2009 - Q1 | 96.1 | 76.8 | -8,5% | 87,5% |
| 2009 - Q2 | 95.8 | 76.6 | -8,3% | 87,2% |
| 2009 - Q3 | 97.1 | 77.7 | -9,5% | 88,4% |
| 2009 - Q4 | 98.9 | 79.2 | -11,2% | 90,2% |
| 2010 - Q1 | 96.3 | 77.1 | -8,8% | 87,7% |
| 2010 - Q2 | 95.8 | 76.6 | -8,3% | 87,2% |
| 2010 - Q3 | 95.4 | 76.3 | -7,9% | 86,9% |
| 2010 - Q4 | 95.1 | 76.1 | -7,6% | 86,6% |
| 2011 - Q1 | 93.4 | 74.7 | -5,9% | 85,0% |
| 2011 - Q2 | 92.5 | 74.0 | -5,0% | 84,2% |
| 2011 - Q3 | 91.3 | 73.1 | -3,8% | 83,2% |
| 2011 - Q4 | 89.7 | 71.8 | -2,1% | 81,7% |
| 2012 - Q1 | 88.7 | 71.0 | -1,0% | 80,8% |
| 2012 - Q2 | 87.8 | 70.3 | 0,0% | 80,8% |

Figure 6

Loan to Value Ratio 2008-2012

As shown in the above table, the Loan (that banks used as collateral) to Value Ratio for loans granted in 2008 is above 90% and almost all other loans are circa 85-90% of property values.

As noted, a decline of more than 5% in property values will begin to result in a number of borrowers going into negative equity. This has significant implications both to them, as they will be paying off a loan that is bigger than the value of their residence, and to the bank, as its exposure to potential losses will increase. Furthermore, it reduces the bank's options if loan default does occur, as the potential income from the asset will not be enough to repay the outstanding loan. Thus, banks will be forced to offload the distressed property and increasing their need for capital.

It has been mentioned before that, property prices affect banks' capital position and thus lending capacity, both directly through valuations of their holdings of real estate assets and indirectly via changes in non-performing loans. In the meantime, because of changes in the methodology for calculating the non-performing loans and provisions for possible future losses, the problem in Cyprus banks could become more and more complicated. This would immediately raise the amount needed for the banks' recapitalisation.

4.4 Bank asset exposure to the real estate market

Table 5: Banks financial analysis 2010

| Year 2010 | | | | | |
|-----------------------|-------------|---------------------|---------------|--------------------------|-----------------------------|
| | | Total Assets | Equity | Real Estate Loans | Real Estate Holdings |
| | <u>Note</u> | Billions | Billions | Billions | Billions |
| Bank of Cyprus | | € 42,636,568 | € 2,639,698 | € 3,866,022 | € 418,781 |
| Laiki Bank | | € 42,580,486 | € 3,641,374 | € 4,586,561 | € 42,410 |
| Hellenic Bank | | € 8,236,725 | € 534,264 | € 1,339,234 | € 115,218 |

Table 6: Banks financial analysis 2011

| Year 2011 | | | | | |
|-----------------------|-------------|---------------------|---------------|--------------------------|-----------------------------|
| | | Total Assets | Equity | Real Estate Loans | Real Estate Holdings |
| | <u>Note</u> | Billions | Billions | Billions | Billions |
| Bank of Cyprus | | € 37,474,195 | € 2,342,705 | € 3,074,077 | € 473,188 |
| Laiki Bank | | € 33,761,978 | € 600,558 | € 4,365,136 | € 46,698 |
| Hellenic Bank | | € 8,278,976 | € 434,198 | € 1,442,417 | € 112,509 |

The growth in real estate loans was driven by the strong market demand for both commercial and residential properties, official data showed.

With respect to the total assets of listed banks, Bank of Cyprus and Laiki Bank have the highest bank assets, real estate loans and equity. On other hand, in regards to the real estate holding, Hellenic Bank and Bank of Cyprus have the higher exposure. The first point to note is that Laiki Bank equity experienced a dramatic decrease from 2010 to 2011 by 3.6 billion to 600 million respectively.

Figure 7

Banks real estate loans 2010

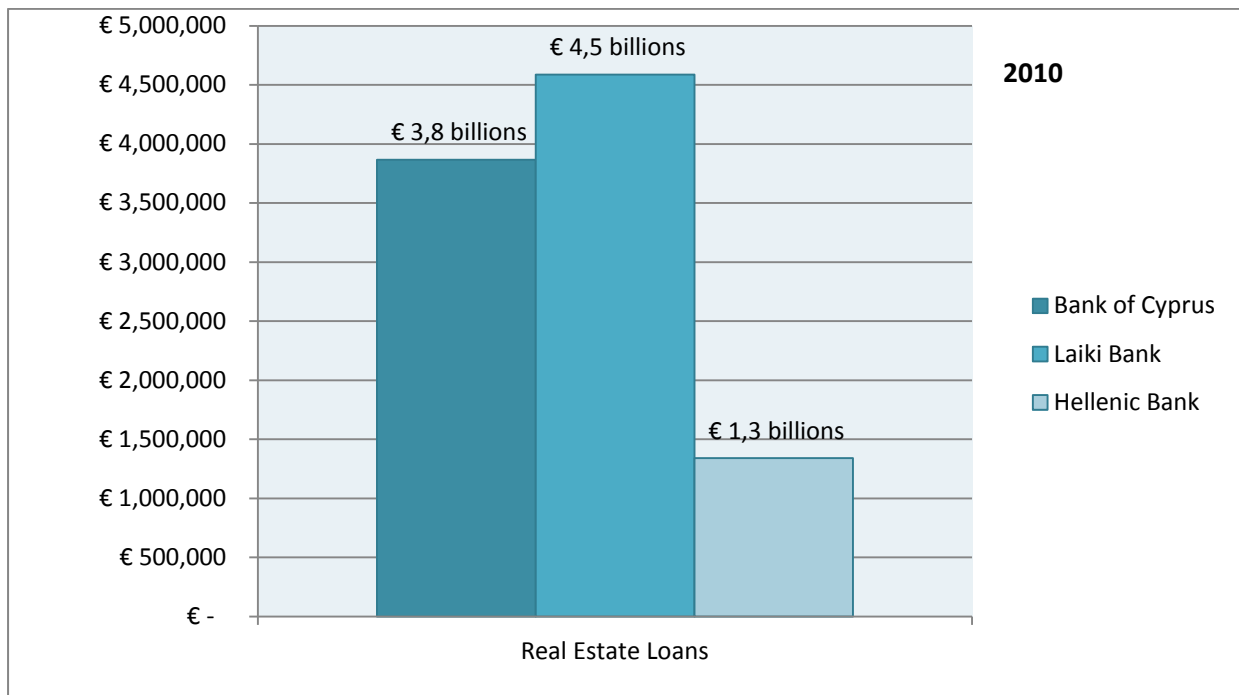


Figure 8

Banks real estate loans 2011

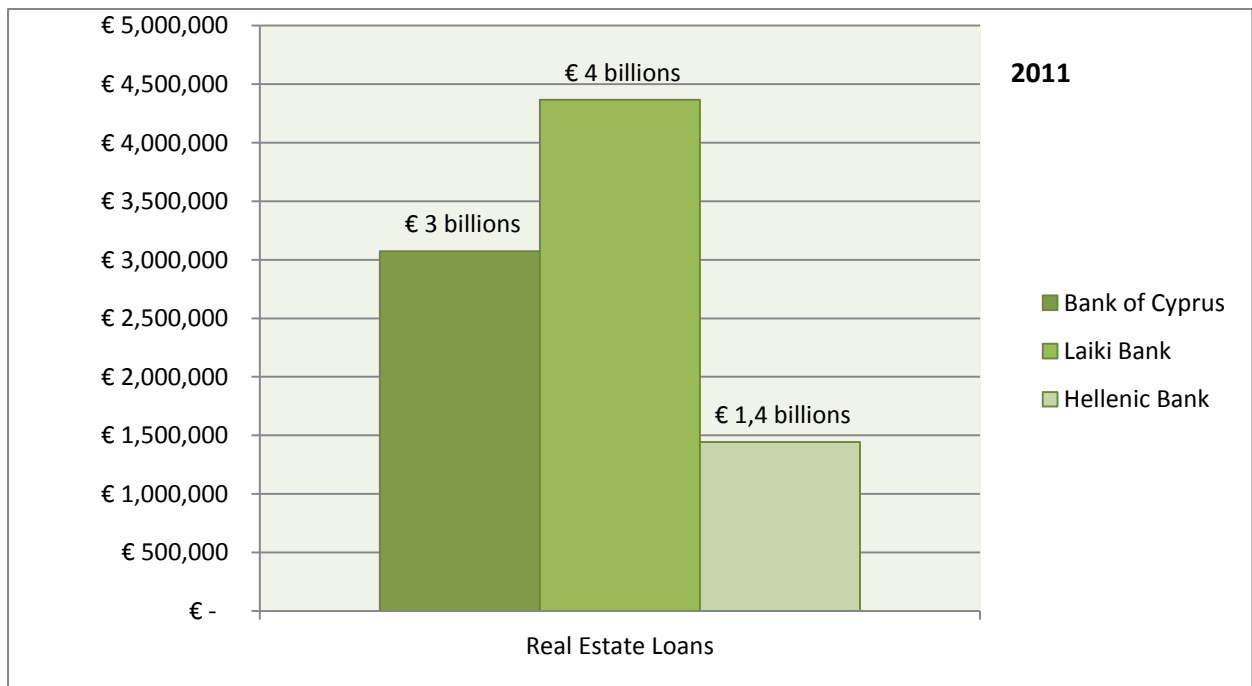


Table 7: Financial ratio analysis 2010

| Year 2010 | | | | |
|---------------------------------|----------------------------|----------------------------|-------------------------|-------------------------|
| FINANCIAL RATIO ANALYSIS | | | | |
| | Real E. Holdings to Equity | Real E. Holdings to Assets | Real E. Loans to Equity | Real E. Loans to Assets |
| Bank of Cyprus | 16% | 1% | 146% | 9% |
| Laiki Bank | 1% | 0% | 126% | 11% |
| Hellenic Bank | 22% | 1% | 251% | 16% |

Table 8: Financial ratio analysis 2011

| Year 2011 | | | | |
|---------------------------------|----------------------------|----------------------------|-------------------------|-------------------------|
| FINANCIAL RATIO ANALYSIS | | | | |
| | Real E. Holdings to Equity | Real E. Holdings to Assets | Real E. Loans to Equity | Real E. Loans to Assets |
| Bank of Cyprus | 20% | 1% | 131% | 8% |
| Laiki Bank | 8% | 0% | 727% | 13% |
| Hellenic Bank | 26% | 1% | 332% | 17% |

As shown in the above table, with respect to the Real E. Loans to Equity, all banks show a ratio above 100%. It is worth noting that Real E. Loans to Equity for Laiki Bank ranges at very high levels. In addition, having in mind Real Estate Loans and Real Estate Assets to total assets and equity overall, it is noted that the higher exposure to real estate is for the Hellenic Bank. Whilst there is no substantial difference between listed banks with respect to relative exposure to the real estate market, it is believed that real estate loans/assets, for each bank, can be considered to be oversized relative to their total assets.

Chapter 5

5.1 Conclusions

Given the weight of real estate assets on the balance sheets of banks, one of the objectives of this study is to assess if bank stock returns are systematically affected by the real estate market returns. The results show the existence of a positive and statistically significant relationship between bank stock returns and real estate market returns. The results further show that an average percentage of 20% of the movement of bank stock returns, for the period 2006-2012, was due to real estate market. The results indicate that banks (see Hellenic Bank) with greater relative asset balance sheet exposure to the real estate sector tend to be more sensitive to real estate market returns.

While the values of real estate loans and mortgages held by commercial banks are often exposed to interest-rate risk, they are also exposed to default risk. As considered in the literature, default risk is, at least in part, a function of changes in real estate value. As collateral values decrease, the probability of incurring a default is high.

This study has also concluded that when property values decline of more than 5% (it seems obvious) it will begin to result in a number of borrowers going into negative equity since banks used the actual value of the properties as collateral to grant the various housing loans. This has significant implications to banks and borrowers. On the one hand, borrowers should pay off a loan that is bigger than the market value of their property, and on the other hand, bank loans will go into default, as the potential income from the asset will not be enough to repay the outstanding loan.

The results point out that the three major banks in Cyprus have high exposure to real estate market relative to their equity/total assets. The highest exposure to Real Estate Loans to Total Assets is with Hellenic Bank. However, Laiki bank has the highest percentage of Non Performing Loans. To this end, banks' real estate exposure will continue to pressure their balance sheets, making it harder to lend and compressing their earnings. Lower profits obviously mean lower stock prices.

In summary, the above results suggest that regulators, bank managers and investors should consider the sensitivity of banks to the real estate market, just as they consider bank exposure to interest-rate risk. Bank managers may consider the creation of hedging techniques in order to secure real estate exposure in the same manner as they sometimes use derivative securities to protect their assets from interest-rate risk. Additionally, banks should include real estate market risk when they estimate the cost of capital while assessing the NPL of bank investments or in asset pricing models to evaluate bank performance. Similarly, when investors forecasting bank values it is highly recommended to use forecast real estate market values along with general stock market and interest-rate trends.

5.2. Limitations of the study

Major limitations of this research were availability of sources. As statistical tests normally require a larger sample size of data, a major limitation of this research was availability of data and the small number of considerable banks in Cyprus. Therefore, to find a trend and a meaningful relationship, the study should have involved more banks at different size and degree of asset exposure. In addition, since the Cyprus Central Bank provides only residential property indices, it is unavoidable that in this study, certain degree of subjectivity can be found. It would be better if it was done with commercial property values as well, since banks hold a large amount of commercial properties.

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Appendices

Financial Statements

Bank of Cyprus

| Bank of Cyprus Group Interim Consolidated Balance Sheet as at 30 June 2012 | | | | |
|--|-------|-------------------|-----------------------------------|-----------------------------------|
| | | 30 June 2012 | 31 December 2011 (restated) | 31 December 2010 (restated) |
| | Notes | €000 | €000 | €000 |
| Assets | | | | |
| Cash and balances with central banks | | 2,238,384 | 1,375,047 | 2,241,825 |
| Placements with banks | | 2,260,579 | 2,627,831 | 5,264,628 |
| Reverse repurchase agreements | | - | 215,936 | 120,166 |
| Investments | 10 | 2,727,295 | 2,629,124 | 4,307,558 |
| Investments pledged as collateral | 10 | 986,801 | 938,070 | 1,038,036 |
| Derivative financial assets | | 126,610 | 193,734 | 76,278 |
| Loans and advances to customers | 11 | 26,460,177 | 27,366,917 | 27,725,451 |
| Life insurance business assets attributable to policyholders | | 500,885 | 504,579 | 561,695 |
| Property and equipment | | 478,258 | 473,188 | 418,781 |
| Intangible assets | | 475,110 | 472,510 | 479,058 |
| Other assets | 12 | 873,896 | 674,439 | 399,287 |
| Investment in associates | | 2,764 | 2,820 | 3,805 |
| Total assets | | 37,130,759 | 37,474,195 | 42,636,568 |
| Liabilities | | | | |
| Obligations to central banks and amounts due to banks | | 4,552,036 | 3,065,756 | 3,706,975 |
| Repurchase agreements | | 784,134 | 785,993 | 913,109 |
| Derivative financial liabilities | | 165,240 | 488,111 | 240,412 |
| Customer deposits | | 28,193,204 | 29,654,498 | 32,952,567 |
| Insurance liabilities | | 605,467 | 611,264 | 658,309 |
| Debt securities in issue | 13 | 34,157 | 49,791 | 83,957 |
| Other liabilities | 14 | 342,153 | 347,697 | 419,295 |
| Subordinated loan stock | 15 | 129,061 | 128,380 | 930,942 |
| Total liabilities | | 34,805,452 | 35,131,490 | 39,905,566 |
| Equity | | | | |
| Share capital | 16 | 1,795,141 | 899,528 | 894,948 |
| Share premium | | 858,711 | 1,164,903 | 1,159,819 |
| Convertible Enhanced Capital Securities | 17 | 430,256 | 862,233 | - |
| Revaluation and other reserves | | (29,922) | 2,585 | (186,677) |
| (Accumulated losses)/retained earnings | | (809,909) | (670,988) | 771,608 |
| Equity attributable to the owners of the Company | | 2,244,277 | 2,258,261 | 2,639,698 |
| Non-controlling interests | | 81,030 | 84,444 | 91,304 |
| Total equity | | 2,325,307 | 2,342,705 | 2,731,002 |
| Total liabilities and equity | | 37,130,759 | 37,474,195 | 42,636,568 |

A. Artemis
E. Xenophontos
Y. Kypril
Chr. Hadjimitsis

Chairman
Vice Chairman
Group Chief Executive Officer
Senior Group General Manager

41. Risk management – Credit risk (continued)**Collateral and other credit enhancements (continued)***Other instruments financial*

Collateral held as security for financial assets other than loans and advances is determined by the nature of the instrument. Debt securities and other eligible bills are generally unsecured with the exception of asset-backed securities and similar instruments, which are secured by pools of financial assets. In addition, some debt securities are government guaranteed.

The Group has chosen the ISDA Master Agreement for documenting its derivatives activity. It provides the contractual framework within which dealing activity across a full range of over-the-counter (OTC) products is conducted and contractually binds both parties to apply close-out netting across all outstanding transactions covered by an agreement, if either party defaults. In some cases the parties execute a Credit Support Annex (CSA) in conjunction with the ISDA Master Agreement. Under a CSA, collateral is passed between the parties in order to mitigate the market contingent counterparty risk inherent in the open positions.

Settlement risk arises in any situation where a payment in cash or securities is made in the expectation of a corresponding receipt in cash or securities. Daily settlement limits are established for each counterparty. Settlement risk is mitigated when transactions are effected via established payment systems or on a delivery upon payment basis.

146**Concentrations of loans and advances**

| | 2010 €000 | 2009 €000 |
|---|-------------------|-------------------|
| By economic activity | | |
| Trade | 3,617,046 | 3,333,752 |
| Manufacturing | 1,755,320 | 1,545,488 |
| Hotels and catering | 2,297,776 | 2,121,002 |
| Construction | 2,747,557 | 2,462,311 |
| Real estate | 3,866,022 | 3,331,556 |
| Private individuals | 8,591,300 | 8,797,667 |
| Professional and other services | 4,065,604 | 3,075,706 |
| Other sectors | 1,944,316 | 1,848,656 |
| | 28,885,850 | 26,508,048 |
| By geographical area | | |
| Cyprus | 13,882,064 | 12,753,230 |
| Greece | 10,154,385 | 9,780,263 |
| Russia | 1,887,215 | 1,400,405 |
| United Kingdom | 1,076,814 | 1,063,252 |
| Australia | 1,011,560 | 618,420 |
| Romania | 624,673 | 677,591 |
| Ukraine | 248,230 | 205,887 |
| | 28,885,850 | 26,508,048 |
| By customer sector | | |
| Corporate | 11,915,470 | 10,756,105 |
| Small and medium-sized enterprises (SMEs) | 7,684,854 | 7,123,008 |
| Retail | | |
| - housing | 5,573,178 | 4,000,559 |
| - credit cards | 399,742 | 346,715 |
| - consumer and other | 3,312,606 | 3,280,671 |
| | 28,885,850 | 26,508,048 |

Hellenic bank

HELLENIC BANK PUBLIC COMPANY LIMITED
STATEMENT OF FINANCIAL POSITION
 at 31 December 2011

| | Note | 2011 €'000 | 2010 €'000 |
|---|------|------------------|------------------|
| Assets | | | |
| Cash and balances with Central Banks | 15 | 218.803 | 143.533 |
| Placements with other banks | 16 | 1.611.322 | 1.218.486 |
| Loans and advances to customers | 17 | 4.985.031 | 4.888.580 |
| Debt securities | 18 | 1.154.755 | 1.716.345 |
| Equity securities | 20 | 13.252 | 24.713 |
| Investments in subsidiary companies | 21 | 91.241 | 91.241 |
| Amounts due from subsidiary companies | | 5.731 | 7.808 |
| Property, plant and equipment | 22 | 91.839 | 93.985 |
| Intangible assets | 23 | 4.034 | 4.670 |
| Tax receivable | | 3.955 | -- |
| Deferred tax asset | 24 | 21.483 | 19.080 |
| Other assets | 25 | 73.876 | 42.392 |
| Total assets | | 8.275.322 | 8.250.833 |
| Liabilities | | | |
| Deposits by banks | 26 | 74.302 | 158.761 |
| Customer deposits and other customer accounts | 27 | 7.103.985 | 6.853.656 |
| Amounts due to subsidiary companies | | 48.336 | 66.507 |
| Tax payable | | 7.669 | 10.253 |
| Deferred tax liability | 28 | 31.221 | 19.648 |
| Other liabilities | 29 | 244.439 | 243.701 |
| | | 7.509.952 | 7.352.526 |
| Loan capital | 30 | 321.502 | 356.700 |
| Equity | | | |
| Share capital | 31 | 132.448 | 132.442 |
| Reserves | | 311.420 | 409.165 |
| Total equity | | 443.868 | 541.607 |
| Total liabilities and equity | | 8.275.322 | 8.250.833 |
| Contingent liabilities and commitments | 33 | 1.191.960 | 1.430.422 |

The financial statements have been approved by the Board of Directors on 30 March 2012.

17. LOANS AND ADVANCES TO CUSTOMERS

| | The Group | | The Bank | |
|---------------------------|------------------|------------------|------------------|------------------|
| | 2011 €'000 | 2010 €'000 | 2011 €'000 | 2010 €'000 |
| Manufacturing | 380.164 | 301.791 | 379.573 | 301.791 |
| Trade | 949.222 | 840.433 | 949.222 | 840.433 |
| Tourism | 332.918 | 327.918 | 332.918 | 327.918 |
| Construction | 1.442.417 | 1.339.234 | 1.442.417 | 1.339.234 |
| Personal and professional | 1.849.950 | 1.857.051 | 1.847.824 | 1.855.128 |
| Other sectors | 677.055 | 756.388 | 675.849 | 756.388 |
| | 5.631.726 | 5.422.815 | 5.627.803 | 5.420.892 |
| Provisions for impairment | (644.899) | (534.235) | (642.772) | (532.312) |
| | 4.986.827 | 4.888.580 | 4.985.031 | 4.888.580 |

Laiki Bank

CONSOLIDATED BALANCE SHEET

31 DECEMBER 2011

| | Note | 2011 € '000 | 2010 € '000 |
|--|------|-------------------|-------------------|
| Assets | | | |
| Cash and balances with Central Banks | 16 | 1.034.086 | 713.579 |
| Due from other banks | 17 | 689.569 | 4.696.112 |
| Financial assets at fair value through profit or loss | 19 | 234.505 | 229.336 |
| Advances to customers | 20 | 24.778.623 | 26.417.333 |
| Debt securities lending | 22 | 1.769.185 | 3.960.788 |
| Available-for-sale financial assets | 23 | 1.791.205 | 2.278.411 |
| Held-to-maturity financial assets | 24 | 889.455 | 1.480.046 |
| Other assets | 25 | 693.234 | 535.782 |
| Income tax assets | 26 | 59.061 | 34.056 |
| Deferred tax assets | 37 | 580.246 | 127.185 |
| Investments in associates | 27 | 115.741 | 113.600 |
| Intangible assets | 28 | 797.780 | 1.634.734 |
| Investment property | 29 | 38.056 | 68.322 |
| Property and equipment | 30 | 291.232 | 291.202 |
| Total assets | | 33.761.978 | 42.580.486 |
| Liabilities | | | |
| Due to other banks | 31 | 10.301.370 | 10.649.850 |
| Customer deposits | 32 | 20.160.804 | 25.508.361 |
| Senior debt | 33 | 376.107 | 477.637 |
| Loan capital | 34 | 1.333.727 | 1.267.931 |
| Other liabilities | 35 | 557.136 | 592.516 |
| Income tax liabilities | 36 | 14.673 | 23.203 |
| Deferred tax liabilities | 37 | 120.621 | 134.634 |
| Retirement benefit obligations | 8 | 296.982 | 284.980 |
| Total liabilities | | 33.161.420 | 38.939.112 |
| Share capital and reserves attributable to the owners of the Bank | | | |
| Share capital | 38 | 1.369.444 | 834.799 |
| Share premium | 38 | 2.334.583 | 2.252.897 |
| Reserves | 39 | (3.209.867) | 447.815 |
| | | 494.160 | 3.535.511 |
| Non-controlling interests | | 106.398 | 105.863 |
| Total equity | | 600.558 | 3.641.374 |
| Total equity and liabilities | | 33.761.978 | 42.580.486 |

CREDIT RISK (continued)

Concentration of risks of financial assets with credit exposure (continued)

(b) Industry sectors

The table below analyses the Group's main credit exposures at carrying amount, as categorised by the industry sectors in which counterparties operate.

| | Manu- facturing € '000 | Tourism € '000 | Trade € '000 | Property and construction € '000 | Personal, professional and home loans € '000 | Financial institutions € '000 | Other sectors € '000 | Total € '000 |
|---|------------------------------|-------------------|------------------|---|--|-------------------------------------|----------------------------|-------------------|
| On-balance sheet assets: | | | | | | | | |
| Balances with Central Banks (Note 15) | - | - | - | - | - | 509.059 | 3.600 | 512.659 |
| Due from other banks (Note 16) | - | - | - | - | - | 4.678.967 | 17.145 | 4.696.112 |
| Financial assets at fair value through profit or loss: | | | | | | | | |
| Debt securities (Note 18) | - | 352 | - | - | - | 7.244 | 30.008 | 37.604 |
| Derivative financial instruments with positive fair value (Note 18) | - | - | - | - | - | 76.432 | 18.187 | 94.619 |
| Advances to customers: | | | | | | | | |
| Advances to individuals | 292.16 | 64.586 | 143.104 | 116.477 | 7.613.919 | 412 | 84.904 | 8.052.618 |
| Advances to corporate entities: | | | | | | | | |
| Large corporate customers | 379.161 | 371.787 | 1.079.248 | 1.759.357 | 881.304 | 168.051 | 5.276.417 | 9.915.325 |
| Small and medium size enterprises | 721.971 | 832.811 | 1.955.026 | 2.709.862 | 1.115.524 | 64.187 | 1.050.009 | 8.449.390 |
| Debt securities lending (Note 21) | - | - | - | - | - | 2.133.001 | 1.827.787 | 3.960.788 |
| Available-for-sale financial assets – debt securities (Note 22) | 28.981 | 1.306 | 1.111 | 865 | 607 | 617.560 | 1.322.456 | 1.972.886 |
| Held-to-maturity financial assets (Note 23) | - | 152 | 826 | - | 377.614 | 795.510 | 305.944 | 1.480.046 |
| Other assets | - | - | - | - | - | 39.506 | 89.550 | 129.056 |
| Total on-balance sheet | 1.159.329 | 1.270.994 | 3.179.315 | 4.586.561 | 9.988.968 | 9.089.929 | 10.026.007 | 39.301.103 |
| Off-balance sheet items: | | | | | | | | |
| Acceptances (Note 43) | 37.863 | 2.638 | 82.497 | 20.483 | 78.144 | 129.063 | 36.400 | 387.088 |
| Guarantees (Note 43) | 39.860 | 43.085 | 107.017 | 366.328 | 138.752 | 27.700 | 590.340 | 1.313.082 |
| Amount of unutilised credit facilities (Note 43) | 9.983 | 2.243 | 27.739 | 49.481 | 62.461 | 180 | 53.494 | 205.581 |
| Total off-balance sheet | 87.706 | 47.966 | 217.253 | 436.292 | 279.357 | 156.943 | 680.234 | 1.905.751 |
| 31 December 2010 | 1.247.035 | 1.318.960 | 3.396.568 | 5.022.853 | 10.268.325 | 9.246.872 | 10.706.241 | 41.206.854 |
| 31 December 2009 | 1.223.155 | 1.096.916 | 3.315.681 | 4.774.244 | 10.179.636 | 9.389.620 | 10.613.049 | 40.592.301 |

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS

45. FINANCIAL RISK MANAGEMENT (continued)

CREDIT RISK (continued)

Concentration of risks of financial assets with credit risk (continued)

(b) Industry sectors

The table below analyses the Group's main credit exposures at carrying amount, as categorised by the industry sectors in which counterparties operate.

| | Manu- facturing € '000 | Tourism € '000 | Trade € '000 | Property and construction € '000 | Personal, professional and home loans € '000 | Financial institutions € '000 | Shipping € '000 | Other sectors € '000 | Total € '000 |
|---|------------------------------|-------------------|------------------|---|--|-------------------------------------|--------------------|----------------------------|-------------------|
| On-balance sheet assets: | | | | | | | | | |
| Balances with Central Banks (Note 16) | - | - | - | - | - | 812,809 | - | 154 | 812,963 |
| Due from other banks (Note 17) | - | - | - | - | - | 689,553 | - | 16 | 689,569 |
| Financial assets at fair value through profit or loss: | | | | | | | | | |
| Debt securities (Note 19) | - | 256 | - | - | - | 9,045 | - | 8,217 | 17,518 |
| Derivative financial instruments with positive fair value (Note 19) | - | - | 87 | - | - | 90,233 | - | 38,862 | 129,182 |
| Advances to customers: | | | | | | | | | |
| Advances to individuals | 30,869 | 46,577 | 139,417 | 88,590 | 6,949,370 | - | - | 73,349 | 7,328,172 |
| Advances to corporate entities: | | | | | | | | | |
| Large corporate customers | 326,021 | 262,943 | 1,151,549 | 1,672,038 | 1,037,838 | 345,700 | 1,919,092 | 2,719,966 | 9,435,147 |
| Small and medium size enterprises | 706,488 | 960,745 | 1,791,886 | 2,603,192 | 968,558 | 31,305 | - | 953,130 | 8,015,304 |
| Debt securities lending (Note 22) | - | - | - | - | - | 1,197,308 | - | 571,877 | 1,769,185 |
| Available-for-sale financial assets - debt securities (Note 23) | | | | | | | | | |
| Held-to-maturity financial assets (Note 24) | 27,208 | 1,198 | 1,988 | 949 | 106 | 463,443 | - | 1,047,328 | 1,542,220 |
| Other assets | 435 | - | 493 | 367 | 3 | 232,775 | - | 127,187 | 361,260 |
| Total on-balance sheet | 1,091,021 | 1,271,719 | 3,085,420 | 4,365,136 | 9,284,515 | 4,234,352 | 1,919,092 | 5,738,720 | 30,989,975 |
| Off-balance sheet items: | | | | | | | | | |
| Acceptances (Note 44) | 15,605 | - | 38,631 | 4,213 | 35,888 | 7,681 | - | 42,810 | 144,828 |
| Guarantees (Note 44) | 88,418 | 51,253 | 175,254 | 525,190 | 77,780 | 86,368 | - | 234,642 | 1,238,905 |
| Amount of unutilised credit facilities (Note 44) | 12,863 | 1,557 | 31,444 | 69,510 | 10,439 | 151 | - | 15,078 | 141,042 |
| Total off-balance sheet | 116,886 | 52,810 | 245,329 | 598,913 | 124,107 | 94,200 | - | 292,530 | 1,524,775 |
| 31 December 2011 | 1,207,907 | 1,324,529 | 3,330,749 | 4,964,049 | 9,408,622 | 4,328,552 | 1,919,092 | 6,031,250 | 32,514,750 |
| 31 December 2010 | 1,247,035 | 1,318,960 | 3,396,568 | 5,072,853 | 10,768,325 | 9,246,872 | 1,810,040 | 8,896,201 | 41,206,854 |