The Dutch system banks throughout the crisis. The Basel framework as a hampering factor on bank performance.

Author: Iwona Poblocka
University of Twente
P.O. Box 217, 7500AE Enschede
The Netherlands

ABSTRACT

This paper reviews the performance of the 4 Dutch system banks during the economic crisis. The banks were followed during the years 2005-2013 and data was collected from their annual statements. During this time the Basel 2 framework was enforced by law in the Netherlands. The paper evaluates the impact of Basel 2 on bank performance. I found that the banks were steadily increasing their Tier 1 and total capital ratios, which are under strict supervision of Basel 2. At the same time the banks have shown decreases in their performance markers, ROE and ROA. I have performed a correlation analysis on the ratios and performance markers of the banks and found that the decrease in ROE and ROA was significantly negatively correlated with the Tier 1 and total capital ratios for the RaboBank, suggesting a link with the measures taken by the banks due to the Basel 2 legislation. I conclude that indeed Basel 2 did impact performance of the Dutch system banks as 3 system banks were nationalized and 1 had a significant decrease in performance. I suggest revisions to banking supervision which include the introducing of a maximum limit to the Tier 1 and total capital ratios in order to boost ROE and ROA performance.

Supervisors:

Dr. X. Huang
Prof. Dr. R. Kabir
Dr. H. van Beusichem

Keywords

Basel framework, Basel 1, Basel 2, Banks, ROE, ROA,

1. Introduction

During the economic crisis which started in 2007 in the USA, various banks have gotten into trouble and either were bailed out or ceased to exist all together. The Dutch banking sector also suffered heavy hits. The timing of the economic crisis was uncanny, at the time a lot of big changes were going on in the Dutch banking scene, ABN AMRO was selling off most of its international assets and was about to be bought by Belgian bank Fortis (in conjunction with some other banks) in order to merge their Dutch operations with ABN AMRO. A cascade of events caused the deal to bust and for ABN AMRO to become nationalized in order to prevent them from going bankrupt in the aftermath of the failure of the Fortis deal. The other system banks in the Netherlands (ING, SNS Bank and Rabobank) also suffered under the economic crisis which by that time was in full swing. Only the Rabobank currently is not nationalized and was not bailed out with tax payers' money. People and policymakers demanded the banking sector to be disciplined and called for new measures and in response some of the most influential countries adopted stringent accords in order to prevent this from happening in the future.

The Basel Committee on Banking Supervision (BCBS) over the years has issued recommendations in relation to banking regulations. These accords are referred to as the Basel Accords and are generally implemented by the G-20 countries including Hong Kong and Singapore. Though the recommendations are not binding, most of the member states enforce the recommendations by (local) law. Originally conceptualized in 1988 and later on implemented by the Group of 10 countries (G-10) the Basel 1 accord was primarily focused on credit risk and appropriate risk weighting of assets. The superseding set of accords, Basel 2, were published by the BCBS in 2004 (and updated in the following years). Basel 2 in most countries replaced Basel 1, or in some countries banks were given a choice of following any one set of the rules. As the global financial crisis struck, some scholars and policy makers blamed the Basel 2 accord for partly causing or at least increasing the effects of the crisis. In response to the crisis the BCBS introduced Basel 3 which did not replace the first two accords but in a sense supplements them. It was intended to provide a stronger regulatory framework which had 5 key components: better quality of regulatory capital, better liquidity management and supervision, better risk management and supervision, enhanced disclosures (related to securitization, off-balance sheet exposures and trading activities) and cross border supervisory cooperation. The OECD concluded in a study that the Basel accords encourage unconventional business practices which contributed to the economic crisis, due to the fact that the accords regulated capital based on risk-weighted assets. Further criticism came when Basel 3 was announced, saying that the tighter capital requirements based on risk-weighted assets could further contribute to unconventional business practices. Other institutions and scholars have also argued that the Basel accords would make banks systemically dependent on private rating agencies (Miles, Yang, & Marcheggiano, 2013; Nicolas & Firzli, 2011; Greenspan, 2007; Koziol & Lawrenz, 2009; Memmel & Raupach, 2010).

This paper focusses on the Dutch system banks (ABN AMRO, ING, Rabobank & SNS Bank) and how they got through the recent financial crisis. The intent of the research is to compare the capital structure of the banks during and immediately after the crisis and to identify to what extent the Basel 2 framework influenced the capital structure of the banks. Bank performance can be derived from the income before tax, which is found in the annual statements of the banks. I will see how the banks have performed throughout the crisis years and compare their performance. Based on this I will be able to see how the performance of the system banks in Holland was influenced by Basel 2. In addition the paper discusses the benefits and negatives of bank restriction and supervision.

This paper will try to promote the idea of having customized measures of supervision and restriction not just per country, but also per type of banking institution. Banks though similar they may be, have different characteristics depending on each institution. As such it is this papers goal to get that point across and convince its readers of that very notion.

The main research question is

To what extent did the implementation of the Basel framework influence the performance of Dutch system banks?

In order to answer this research question I have devised a set of sub questions: 1. What are the Basel accords? 2. How do the Basel accords impact banking performance? 3. How does the banking regulation and supervision look like in the Netherlands? 4. What were the differences between the performance of the banks when comparing the year of the "beginning" of the crisis (2007) and the "end" (2011)?

2. Literature review

2.1 Basel accords

As this paper focusses on the period between 2005 and 2013 during which Basel 1 and 2 were active, this paper will not reflect on Basel 3. However there is a brief description concerning Basel 3 to be found in the appendix, along with a more elaborate description of Basel 1 and 2.

Basel 1

Basel 1 which came into effect in 1992 and had as a goal to force banks to have enough capital for the absorption of loses and the avoidance of competitive conflicts between banks (to create a level playing field). Basel 1 regulated the capital minimum that was needed to be had by financial institutions which operated internationally for the minimization of credit risk (minimum risk-based capital adequacy). Banks were required to hold a minimum amount of 8% total capital based on a percent of risk – weighted assets (Zaher, 2007). Basel 1 is based on a two-tiered capital where predominantly Tier 1 is being used by banks to show that they are well financed and able to withstand times of crisis. This is why banks prominently show their Tier 1 and their total capital ratios in their annual statements. Tier 1 is the core capital which includes stock issues (or shareholders equity) and declared reserves, such as loan loss reserves. Tier 1 capital is generally used to cover unexpected losses that might occur to a bank. It is however not intended to cover a banks expected loses, for this banks should use other sources like current year profits. The Basel framework allows countries to change it to their particular needs and as such each country can increase or decrease the ratio limits accordingly. In the Netherlands during Basel 1 compliance (till 2008) the Tier 1 ratio minimum was 4 %. In addition to Tier 1 also total capital ratio is highly regulated by Basel 1. This mandates the banks to have a certain ratio of capital to their risk weighed assets (RWA). During Basel 1 in the Netherlands the minimum was 8%.

Basel 2

When Basel 2 was established it was based on 3 pillars. Minimal capital requirements, supervisory review and market discipline. The first Basel accord only in part covered these topics, while some were left out altogether. It is much more complex than Basel 1 and its intention is to align the required regulatory capital with actual bank risk. The heart of the new accord is the minimal capital requirement, banks have to have hold capital against 8% of their risk weighted assets. In the Netherlands the minimum ratios for Tier 1 and total capital ratio were set on 9 % and 12.5 % respectively.

Throughout the years Basel 2 was updated several times with changes to certain risk calculations and assertions. These constant updates played a part in the delay of the global implementation of the accords. In addition each country decided its own way of implementing the accords the way they saw fit. In the United States for instance the implementation was long, slow and highly publicized. Also due to the nature of the Basel 2 accord it would seem that some types of banks get favored compared to others (Big over small). After the financial crisis struck criticizers of the accords blamed the framework of the accords as in their opinion they actually increased the impact of the crisis on the banks (Harper, 2007). Summarizing the general advantages and disadvantages of the Basel framework and the way it is implemented, the following can be noted.

Advantages: 1. Facilitates avoidance of competitive conflicts between banks. 2. Categorized risk weighing. 3. Framework facilitates private monitoring of banks. 4. Future adoption of the framework intends to take future loses of banks (procyclicality) into account.

Disadvantages: 1. Totalitarian approach. 2. No regard for ownership structure of the banks. 3. Preventing diversification, making banks more reliant on core activities (loans etc.). 4. Framework does not anticipate the possibility of banks to move around risk buckets (transferring risk from the core banking activity to a banks insurance branch for instance).

2.2 Capital structure of banks

The capital structure of banks is usually held in secrecy by the bank in question, however theories on the capital structure of banks exist from literature and can as such be used in order to explain the different ways of how a bank's capital structure can look like. Though banks are run much like regular businesses there are still key differences that are unique to a bank. Banks are different from regular firms in that they raise money by deposits. Regular firms and banks use equity and bonds, but banks are unique in that they use deposits as well. Throughout the years the role of the deposits at banks has changed in terms of relevance, they are still however a vital part of a banks funding source. Not just people or families hold deposits in banks, but also firms do. They hold deposits in banks for the sake of transaction completion and reserves. These deposits are then loaned out to other individuals that need money, after which they pay it back to the bank with an interest rate. Alternatively a bank can use deposited money in the capital market. Banks generate revenue in a number of ways including interest, transaction fees and advice. However there are also risks involved with banks and their business. The outcome of these risks is dependent on how a bank's management understands and anticipates on these risks. Some of these risks are: Credit risk, liquidity risk, market risk, macro-economic risk, operational risk and reputational risk.

Because banks are so important for a country's financial system banks have a regulation that they have to follow. Banks have to comply with rules when it comes to the amount of capital that they should have at all times. Bank capital is mainly made up out of equity, retained earnings and subordinated debt. The rules that banks have to comply with are based on the Basel framework, about which more can be found in the appendix.

2.3 The impact of bank regulation and supervision on bank performance

In the paper of Barth et al. (2004) the regulatory measures taken against banks are criticized. They were intended to help prevent future economic crisis but the paper states that most of the measures would actually increase the likely hood of an economic crash again. At the time of writing the article, the Basel II accords were just being published and were not yet implemented by the participating countries however nevertheless the authors shed their view on the proposed measures and how they would negatively impact bank performance, development and stability. The paper states in their findings that restricting bank activities and their ability for diversification (meant for the banks to focus on their core activities) is actually making banks more unstable, since they are not able to base their income sources on non-loan activities. Additionally they authors note that stringent capital regulations are not associated with bank development, performance or stability. According to their outcomes they don't find that capital regulations are positively related to favorable banking sector outcomes, regardless of institutional or policy environments. The paper also states that they found a negative relationship between diversity and the likelihood of suffering a crisis, this means that non diverse banks are more likely to suffer a major crisis, in particular in small economies. Generous deposit insurance schemes are found to be strongly negatively correlated with bank stability. Other proposed measures such as official supervisory agencies, stringent capital standards and private sector bank monitoring cannot counter the negative effect of a generous deposit insurance scheme.

Though the paper did find that facilitation of private monitoring of banks is associated with better bank-sector outcomes, however it does not decrease the likelihood of suffering a major financial crisis. The paper also concludes that government ownership of banks is associated with corruption and bad banking outcomes. They state that there is no evidence whatsoever that government owned banks are associated with positive outcomes. The paper however states that a selective group of measures are beneficially associated with bank development, performance and stability, and that more research is needed to better understand which measures would work beneficially and which not. But that a totalitarian approach could actually work in an opposite direction as to its intention (Barth, Caprio Jr & Levine, 2004).

Blundell-Wignall and Atkinson (2010) describe the intended measures that Basel 3 is supposedly going to take. They reflect on the positive changes of the Basel 3 framework but also on the in their opinion insufficiencies. The authors summarize by saying that in the recent financial crisis the too big to fail institutions took on to much risk. Basel 3 intends to address some issues which should prevent a crisis as the last one to occur again. The authors feel that it is good that Basel 3 will support a leverage ratio, a capital buffer and it will deal with procyclicality through dynamic provisioning which takes expected loses into account. Weaknesses however they feel are: The new framework does not cover the ability of moving risks over to for instance their insurance activities which is a least regulated area in banking. The paper cites this as one of the main problems with the framework which requires addressing in order to prevent implications for the reform process. They also suggest that there should be a single regulator for the whole financial system, even for the system globally. This could play a role in preventing the aforementioned shifts. The authors also feel that the general framework issues make it challenging to deal with concentration issues in pillar 1 (Blundell-Wignall & Atkinson, 2010).

Laeven and Levine (2009) have investigated the impact of bank ownership and regulation on the risk taking behavior of a bank. The researchers theorize that bank owners and bank managers can have potential conflicts over bank risk taking, they state that the same regulation has different effects on each bank depending on the comparative power of the shareholders in the governance structure of the banks. Their findings suggest that banks with more powerful and influential owners tend to take more risk. Furthermore they conclude that indeed they found that the same regulation has different effects on each separate bank depending on their ownership structure. What is positive for one bank can be negative for another. They conclude that that ignoring ownership structure leads to wrong and incomplete conclusions relating to the impact of capital regulations, deposit insurance and activity restrictions and bank risk taking (Laeven & Levine, 2009).

2.4 Dutch banking system regulation

The Dutch banking system is regulated by De Nederlandse Bank (DNB). The DNB core activities are the provision of stability to the Dutch banking system and with this add to the countries prosperity. This achieved by the following sub activities: 1. Cooperation with other ECB member state banks for the prevention of inflation. 2. Establish a reliable and smooth environment for payments to be performed in. 3. Ensure that financial institutions and insurance companies within Holland have enough capital in order to fulfill their responsibilities. 4. Giving of advice for the sake of making well weighed international decision to maintain the before mentioned goals and activities.

Though one of the characteristics of the Basel 2 accord implementation was that all of the involved countries implemented it in their own way, according to their own time schedule. In the Netherlands the DNB mandated all the financial institutions active in the country to have implemented the framework by January 1st 2008 the latest. As such currently all institutions in the country comply with the framework. In some cases however the DNB can demand extra capital demands, the DNB can do this if the DNB feels that the institution in question is not fully open in their financial statements. In the Netherlands the framework is included in the "wet financieel toezicht" (legislation for financial supervision) and some other lower legislations (De Nederlandse Bank [DNB], 2014).

Upon reviewing of the literature I devised a theory that the Basel framework was in some way able to (negatively) influence the performance of the Dutch system banks.

As such I pose the following hypothesis: Capital structure dictated by legislation based on the Basel framework leads to poor bank performance.

3. Methodology

As this paper is investigating the event of the financial crisis in the Netherlands and how it affected the system banks during this time, the study uses a retrospective explanatory case study method.

The Tier 1 capital ratios and total capital ratio of the banks will be evaluated over the specified time period and their trend will be analyzed. These capital markers were chosen as they are prominently used by the banks in their annual statements to indicate that a bank is well funded and that they are prepared for any unforeseen loses. Additionally the income cost ratio, return on equity (ROE) and return on assets (ROA) of the banks was analyzed as a contrasting performance marker which is currently not mandated by the Basel framework and its derived legislation. The income cost ratio reveals how efficient an organization is by taking its operating expenses and dividing them by the operating income. The higher the percentage is the worse the organization performs in terms of efficiency. ROE is also a ratio which reveals relevant performance details as it indicates how much of the money invested by shareholders is turned into profit. This is an often used ratio to compare profitability of companies in the same business field. The ROE is calculated by taking the net profit and dividing it by the shareholders equity. The ROA calculation gives a good indication of how profitable a bank is relative to its total assets. It is also a good way of comparing the banks to each other and highlight any differences between them. It is indicative of which bank was able to make more money with its total assets at a certain period in time. ROE and ROA are also used in literature as a comparative tool for bank performance (Jha and Hui, 2012; Doğan, 2013).

I collected the annual statements of the 4 system banks (Abn Amro, Ing, Rabobank and SNS). The statements range over the years 2005-2013 in order to give a full overview of the onset and progression of the financial crisis and its effect on the Dutch system banks. Through correlation analysis of the annual statements I have tried to find out if over the time of the financial crisis the bank performance dependent variables: ROA and ROE have deteriorated and if this was connected to the increasingly strict Basel framework (represented in this paper by the independent variables: Tier 1 capital ratio and the total capital ratio). Correlation analysis was also used by Jha and Hui (2012) to show in their data set performance trends for Nepalese banks. Calculations were done by Microsoft Excel using the data analysis add in.

4. Results

The annual statements of the banks contained detailed performance data relating to not only their net income but also their operating costs and assets held for the period under review. Some of the banks already process their data showing some performance markers where as others just show their figures in details but do not do extensive data interpretation. For this section I have tried to find the values of interest in the annual statements and they were adopted if they were presented in the statements. If the values however were missing then the values were calculated using the appropriate variables.

Tier 1 capital ratio (in %)									
	2005	2006	2007	2008	2009	2010	2011	2012	2013
ABN AMRO	10,6	8,5	12,4	9,4	10,2	12,8	13,0	12,9	15,3
ING	7,3	7,6	7,4	9,3	10,2	12,3	11,7	14,4	13,5
RaboBank	11,6	10,7	10,7	12,7	13,8	15,7	17,0	17,2	16,6
SNS	8,7	8,2	8,4	10,5	10,7	10,7	12,2	7,7	16,6
Total capital ratio (in %)									
	2005	2006	2007	2008	2009	2010	2011	2012	2013
ABN AMRO	13,1	11,1	14,6	12,6	14,8	16,6	16,8	18,4	20,2
ING	10,9	11,0	10,3	12,8	13,5	15,3	14,3	16,9	16,5
RaboBank	11,8	11,0	10,9	13,0	14,1	16,3	17,5	19,0	19,8
SNS	11,9	11,2	11,5	14,0	13,9	16,7	14,4	9,3	16,7

Table 1: Basel performance markers (Tier 1 capital ratio and total capital ratio in %)

4.1 Tier 1 capital ratio

As explained earlier in the paper, the Tier 1 capital is a bank's core capital it is theoretically intended for protecting a bank against unexpected loses. As such it is a generally accepted marker to gauge if a bank is well funded for these unexpected losses. The Tier 1 capital ratio performance of the 4 system banks in the period spanning from 2005-2013 is shown in table 1. It has to be noted that during this period both Basel 1 standards and Basel 2 for the Tier 1 capital ratio standards were implemented as legislation (Basel 1 from 2005-2008 with a Tier 1 capital ratio requirement of 4.0 % and Basel 2 from 2008-2013 with a tier 1 capital requirement of 9%). In addition during the transition of ownership and subsequent nationalization after the purchase of ABN AMRO failed, the bank was allowed to report its ratios still using the Basel 1 standard. However the DNB did increase the ratio demands (9% for Tier 1 capital ratio and 12.5% for total capital ratio). Except SNS none of the banks have dipped under de required minimum Tier 1 capital ratio. Only the SNS bank in 2012 fell under the minimum value. In general the rest of the banks show an increasing trend in their Tier 1 capital ratios.

4.2 Total capital ratio

Similar to the Tier 1 capital all banks except for the SNS bank have complied with the minimum requirement for total capital ratio that was active during the Basel 1 and 2 period (8 and 12.5 % respectively). It is worth to note that there is a clear increasing trend visible in virtually all of the banks, vastly surpassing the minimum requirement. The SNS bank was again the only bank that failed to meet the minimum requirement in 2012. The bank was subsequently nationalized and immediately improved drastically in the following year.

4.3 Income cost ratio

Income cost ratio is not subjected to a minimum requirement by the Basel framework. However it is a very useful bank performance marker. If the percentage is high this then means that the bank is spending more money on operating costs rather than what it is earning with it operating income, if the number is low this means that a bank is very efficiently spending its money for its operating costs, since it gets relatively high amounts of operating income back. Since it is not a performance marker mandated to be upheld by the Basel agreements to certain minimum, banks very often in the sample set did not report this ratio. In these cases I have calculated these values by dividing the operating costs by the operating income. Here more fluctuations are visible compared to the previous 2 performance markers, as can be seen in table 2. ABN AMRO in their years prior to their nationalization showed to be very inefficient as it had an income cost ratio of 92.4 % in 2007 and it was showing a gradual increase from 73 % in the previous years. After the nationalization it seems their ratio stabilized at the 65 % mark. The 100 % seen in 2008 is not relevant here as the bank indicated that it had a negative cost income ratio for that year so the 100% was entered manually to show that in that year the bank actually was losing more money than it was making. Furthermore ING showed in the year of their nationalization a considerable spike in their income cost ratio as well. All the other banks seemed to be fairly efficient in their operations.

Income/cost ratio (in %)									
	2005	2006	2007	2008	2009	2010	2011	2012	2013
ABN AMRO	73,0	83,4	92,4	100,0	76,0	92,0	69,0	64,0	65,0
ING	64,1	63,5	65,5	82,6	67,6	55,1	58,7	59,5	56,6
RaboBank	66,7	68,5	69,5	65,3	64,6	64,5	64,9	66,1	75,0
SNS	59,8	62,6	60,3	62,8	57,0	57,8	49,9	56,8	50,0
Return on equity (in %)									
	2005	2006	2007	2008	2009	2010	2011	2012	2013
ABN AMRO	23,5	20,7	38,4	21,0	-2,7	-3,4	7,8	8,5	8,5
ING	22,9	23,6	17,5	2,3	5,0	13,1	10,9	8,8	11,7
RaboBank	9,7	9,4	10,2	9,7	7,3	8,6	7,6	5,4	5,2
SNS	14,9	14,1	12,6	6,7	-4,6	-27,3	2,2	-53,8	-52,4
Return on assets (in %)									
	2005	2006	2007	2008	2009	2010	2011	2012	2013
ABN AMRO	0,50	0,48	0,97	0,54	-0,06	0,29	0,24	0,29	0,31
ING	0,48	0,43	0,37	0,07	0,06	0,49	0,42	0,38	0,40
RaboBank	0,41	0,42	0,47	0,45	0,36	0,42	0,36	0,27	0,30
SNS	0,38	0,33	0,39	0,19	-0,12	-0,55	0,05	-0,88	-1,81

Table 2: Non Basel performance markers (income/cost ratio, return on equity and return on assets in %)

4.4 Return on equity

When looking at the return on equity data in table 2 it can be clearly seen that some of the banks had an intense fluctuation. Some of the banks in the post crisis time reported their ROE in their annual statements, but hardly any bank reported these numbers explicitly during and immediately prior to the financial crisis. When the numbers were missing from the annual statements they were calculated by taking the net income and dividing by the shareholders equity. The biggest tumble was made by SNS bank which since 2008 started a steady decrease in ROE (except for a minor revival in 2011). ABN AMRO similarly also made a hefty tumble in 2009 they were at -2.7% compared to a whopping +21% a year earlier. After the nationalization ABN AMRO recovered its ROE and remained stable at about 8%. ING bank never showed a negative ROE but it came very close in 2008 with 2.3% while in the year prior to that they had a plus of 17.5%. The only real stable bank in this statistic is RaboBank which stayed around the 6% mark.

4.5 Return on assets

When observing the values of the return on assets of the banks in table 2 it is clear to see that 3 out of 4 banks started a clear decrease in this ratio from the year 2007 and onwards. ABN AMRO decreased 0.43%, ING decreased 0.30% and SNS decreased 0.20% in 2007/2008. SNS went

to even enter into the negative range until 2013 despite them being nationalized in 2013. ING and ABN recovered their ratio fairly quickly after their nationalization. Rabobank is the only stable bank again, however they are showing slower signs of decrease as well.

	ABN AMRO				RaboBank			
	ROE vs Tier1 CR	*ROE vs TCR*	*ROA vs Tier1 CR*	*ROA vs TCR*	*ROE vs Tier1 CR*	*ROE vs TCR*	*ROA vs Tier1 CR*	*ROA vs TCR*
Pearson's correlation	-0,255	-0,483	-0,078	-0,346	-0,837	-0,907	-0,785	-0,844
Significance	0.508	0.188	0.842	0.362	0.005	0.001	0.012	0.004
	ING				SNS			
	ROE vs Tier1 CR	ROE vs TCR	ROA vs Tier1 CR	ROA vs TCR	ROE vs Tier1 CR	ROA vs TCR	ROE vs Tier1 CR	ROA vs TCR
Pearson's correlation	-0,528	-0,544	0,084	0,051	-0,432	-0,224	-0,679	-0,426
significance	0.145	0.131	0.830	0.897	0.246	0.562	0.044	0.254

Table 3: Correlation statistics for ROE and ROE versus Tier 1 capital ratio and total capital ratio

4.6 Correlation analysis

The relationships between ROA/ROE versus Tier 1 capital ratio and total capital ratio were tested using correlation analysis, see table 3. Coming to attention the most are the statistics of RaboBank, they are showing all round strongly negative correlations which indicates their downward trend of their banking performance. The strong negative correlation is explainable by the fact that ROA and ROE are steadily worsening while Tier 1 and total capital ratio are going up. This means that the bank is focusing extremely on keeping its Basel regulated ratio's up rather than increasing its profitability. The Pearson correlation is also strongly significant for all of the correlations tested for the RaboBank when significance for p is set at <0.05. SNS bank has a similar negative correlation although it is weaker than in the case of RaboBank. Especially the ROA versus the Tier 1 capital ratio correlation is fairly strongly negative, this implies that the bank was not able to maintain their profit generation from their assets and actually had this slide down into negativity as was mentioned in section 4.5. The Pearson correlation was also not significant for most of the statistics, this can be explained by the fact that the bank had a drop in Tier 1 and total capital ratios in 2012, if this drop would not have occurred the correlation would have been much closer to significance all-round. ABN AMRO had relatively weak negative correlation for the relation between ROE and their Tier 1 capital ratio and a slightly stronger negative correlation for their ROE and total capital ratio, indicative of the fact that ABN was actively trying to strengthen their Tier 1 and total capital ratio's instead of trying to increase or at the very least keep their ROE stable. When it comes to their ROA to total capital ratio correlation they also have a weak negative correlation of -0,346 however the correlation between their ROA and their Tier 1 capital ratio has a value close to zero, which indicates that their ROA in relation to their Tier 1 ratio is not correlated. There was also no significance found for the correlation, this can be explained by the fact that ABN AMRO got saved by the government and had a large capital injection and as such was able to pull back their ROE and ROA performance. ING has a fairly strong negative correlation between their ROE values and their Tier 1 and total capital ratios, meaning that their ROE is showing a downward trend over the years while their Tier1 and total capital ratios are going up. Although it is not statistically significant at p <0.05. Their ROA versus Tier 1 and total capital ratio values are not correlated as their value is close to zero. The same explanation like the one at ABN AMRO applies here, the bank got saved and as such fairly quickly was able to recover its ROE and ROA performance using government support.

5. Discussion

From the data it can be deducted that almost all of the banks all of the time complied with the most stringent performance markers mandated by the Basel accords, Tier 1 capital ratio and total capital ratio. Only the SNS bank really failed these two performance markers in 2012, consequentially they were nationalized and are now according to those parameters recovering. However looking at some other non-mandated performance markers (Cost income ratio and Return on Assets) I see that there is a bit more information revealed. Looking at the cost income ratio I see that in particular ABN AMRO was very inefficient with a rating of 92.4 % in 2007. This should be a worrying statistic seeing how the inefficiency ratio was rising for at least 2 years prior already with considerable steps, and yet the DNB did not see potential problems on the horizon as the Tier 1 and total capital ratios of the bank were fine. In fact the DNB even agreed with a takeover of the bank (which failed because of the economic crisis and the misjudgment of the state of ABN AMRO by the purchasing parties). If however closer attention would have been paid to the cost income ratio of ABN AMRO at the time perhaps the whole take over fiasco could have been prevented and the nationalization might have never happened, this leads us to believe that some banks might actually keep their Tier 1 ratio numbers and total capital ratio numbers extremely high just to be able to say that they meet the most stringent government demands and that they are not in trouble. And yet the bank was nationalized and went through a heavy reorganization through which however their Tier 1 capital ratios and total

capital ratios were always above the needed minimum. Looking at the ROE values I see that there is a distinct drop visible from all of the banks that were nationalized (ABN AMRO, ING and SNS). Interestingly the SNS bank showed the biggest drop in ROE but was not nationalized until 2013 by which time they were already scoring negative ROE values for 4 years. A similar observation is seen in the ROA values. This further fortifies my claim that other performance factors should be included in bank supervision, since the Basel mandated ratios remained above the required minimum. If however the Basel framework would have also included minimums for these alternative performance markers that I propose here then the late takeover of the SNS bank could have been done much earlier and their reorganization could have taken place before, speeding up the recovery of the Dutch banking system. I feel that these findings show that in order to comply with the stringent Basel rules the Dutch banks have focused more on beefing up the Basel ratios and have slipped in their general banking performance. Also a reasonable ceiling value for the income/cost ratio should be mandated by the framework, this way banks will be forced to keep their operation efficient and profitable. If a bank should fail to meet the ROE, ROA and the income/cost ratio minimum values then disciplinary action should be taken by the government, as should have been the case with the SNS bank back in 2009. The only bank which maintained a seemingly stable ROE, ROA and income/cost ratio was the RaboBank, they are also the only bank which was not nationalized of the 4 system banks. This proves that my proposed additional performance markers are good indicators of a bank's current financial state. However even though apparently RaboBank was performing stable, they too are still showing clear signs of decline in their ROA and ROE performance. Correlation analysis of this bank showed that they are the only bank that significantly went down in performance and because the other banks were rescued through nationalization their correlation analysis did not show any significance. I conclude from the correlation analysis that indeed the performance markers ROE and ROA are negatively correlated with Tier1 and total capital ratios, the more the ratios went up the more the performance markers went down in most cases. The fact that ABN AMRO, ING and SNS got rescued gave these banks the opportunity to improve their numbers and as such prevent significance in their correlation analysis. After revealing these results my advice would be that the Basel framework should also include rules with regards to maintaining a minimum level of ROE and ROA or alternatively (and probably more feasibly) a limit to the surplus amount of Tier 1 and total capital ratios that can be held by a bank. The idea behind this suggestion is that if money is held as Tier 1 or total capital required money then it also can't be used to generate profit. Banks seem to habitually over fund their Tier 1 and total capital ratios and are now using these mandated ratios as a (wrongly) representative "profitability" marker of sorts. Tier 1 and total capital ratios are not indicative of a bank's profitability performance and therefore are confusing in the message

they confer. If a bank however has great amounts of Tier 1 and total capital to its disposal but their profitability performance is steadily decreasing (as was the case with SNS and to a lesser extent RaboBank) a bank will sooner or later run out of its cash and will also start to lose its emergency money, or in the case of this study the Tier 1 and total capital money ratio money. I however am not able to say something about a root cause as to why the ROA and ROE went down so dramatically, for this more research is needed. I did notice during the analysis that the Dutch system banks differ greatly in size. ING bank currently is the biggest one in terms of assets and the amount of countries that it has a presence in, while SNS is the smallest one with its operations solely based in the Netherlands. It can be seen from the collected data that despite the fact that SNS is the smallest bank they were in the biggest trouble in the last few years. Though ING and ABN AMRO were nationalized a few years before SNS, it is however clear that even the smallest of the system banks was struggling. They were struggling to maintain their Tier 1 and total capital ratios and their profitability performance had collapsed. Therefore it might be wise to introduce custom measures depending on the size of the banks. Smaller banks might struggle to cope with some of the measures currently in force and therefore a set of specific changes might be beneficial for these banks. More research in this field needs to be done to explore a custom set of banking supervision rules, but as the results show one bank is not the same as the other.

6. Conclusion

The results have shown that through the economic crisis all banks were able maintain their Tier 1 capital and total capital ratios on a higher level than was required. During this time 2 banks became nationalized to prevent them from collapsing, although their Basel ratios did not indicate any imminent threat. The alterative ratio's that I propose here (ROA, ROE and income cost ratio) did show however that these banks were considerably deteriorating performance wise, however these ratio's at present are not legislated by the Basel rules. The data also shows that the third bank which was nationalized (SNS) based on my proposed performance markers should have been nationalized much sooner, but I feel that this did not happen due to the fact that this bank had their Basel ratio's far above the minimum at the time when the alterative markers were already showing a strong decline in banking performance. I conclude that the Basel frame work has created a mindset in the banks which makes them continuously attempt to beef up their Tier 1 capital and total capital ratios in order to convince observers that they are doing well and that they are sufficiently funded, however when looking at the proposed bank performance markers it can be seen that the banks were not doing as well as the Basel ratio's might have been implying at least from a bank performance perspective which is based on ROE and ROA. I have shown in the correlation analysis that the decline in ROE and ROA is correlated to the increase in the

Tier 1 and total capital ratios for almost all of the banks however since 3 out of 4 banks were rescued their numbers improved drastically. The only bank that was not rescued, the RaboBank, suffered the most and their performance markers for ROA and ROE have slipped significantly and as such we have proven that indeed the implementation of the Basel framework has over time impacted the profitability performance of the 4 Dutch system banks. I propose that banking supervision should include the using of requirements for ROE, ROA and income cost ratio values as I show that these markers are equally important as the already upheld Basel ratios. Particularly ROE and ROA should be included in banking legislation and they should be maintained to a certain level, additionally I propose that banks should also be limited to the surplus amount of money they can hold in their Tier 1 and total capital ratios.

7. Acknowledgements

7.   References

Miles, D., Yang, J., & Marcheggiano, G. (2013). Optimal Bank Capital*. *The Economic Journal*, *123*(567), 1-37.

Nicolas, M. & Firzli, J. "A Critique of the Basel Committee on Banking Supervision" *Revue Analyse Financière*, Nov. 10 2011 & Q2 2012

Greenspan, Alan: Die Ratingagenturen wissen nicht was sie tun, Frankfurter Allgemeine Zeitung, published online on september 22nd 2007.

Koziol, C., & Lawrenz, J. (2009). What makes a bank risky? Insights from the optimal capital structure of banks. *Journal of Banking & Finance*, *33*(5), 861-873.

Memmel, C., & Raupach, P. (2010). How do banks adjust their capital ratios?. *Journal of Financial Intermediation*, *19*(4), 509-528.

Barth, J. R., Caprio Jr, G., & Levine, R. (2004). Bank regulation and supervision: what works best? *Journal of Financial intermediation*, *13*(2), 205-248.

Blundell-Wignall, A., & Atkinson, P. (2010). Thinking beyond Basel III: Necessary solutions for capital and liquidity. *OECD Journal: Financial Market Trends*, *2010*(1), 1-23.

Laeven, L., & Levine, R. (2009). Bank governance, regulation and risk taking.*Journal of Financial Economics*, *93*(2), 259-275.

Jha, S., & Hui, X. (2012). A comparison of financial performance of commercial banks: A case study of Nepal. *African Journal of Business Management*, *6*(25), 7601-7611.

Doğan, M. (2013). Comparison of Financial Performances of Domestic and Foreign Banks: The Case of Turkey. *International Journal of Business and Social Science, 4*(1), 233-240

De Nederlandse Bank (2014). Retrieved from http://www.dnb.nl

Zaher, F. (2007). Retrieved July 25th 2014 from Investopedia: http://www.investopedia.com/articles/07/baselca pitalaccord.asp

Harper, D. (2007). Retrieved July 27th 2014 from Investopedia: http://www.investopedia.com/articles/07/basel2.a sp

Appendix

The differences between the Basel accords

<u>Basel 1</u>

Basel 1 which came into effect in 1992 had the goal to force banks to have enough capital for the absorption of loses and the avoidance of competitive conflicts between banks (to create a level playing field).

Basel 1 regulated the capital minimum that was needed to be had by financial institutions which operated internationally for the minimization of credit risk (minimum risk-based capital adequacy). Banks were required to hold a minimum amount of 8% capital based on a percent of risk – weighted assets.

Basel 1 is a two-tiered capital:

Tier 1 is the core capital which includes stock issues (or shareholders equity) and declared reserves, such as loan loss reserves

Tier 2 is the supplementary capital which includes all other capital such as gains on investment assets, long-term debt with maturity greater than five years and hidden reserves (excess allowance for losses on loans and leases).

Credit risk is defined as the risk weighted asset (RWA) of the bank, which are banks assets weighted in relation to their relative credit risk levels. Basel 1 stipulates that the total capital should represent at least 8% of the bank's credit risk. In addition, the Basel agreement identifies three types of credit risks:

- The on-balance sheet risk
- The trading off-balance sheet risk. (interest rates, foreign exchange, equity derivatives and commodities)
- The non-trading off-balance sheet risk, including general guarantees (f.i. forward purchase of assets or transaction-related debt assets.

There are 4 categories of assets that are weighted as follows:

O% risk – cash, home country debt like Treasuries
20% risk – OECD bank debt, OECD securities firm debt
50 % risk- residential mortgages
100% risk – private sector debt, non- OECD bank debt, real estate, plant and equipment.

As such when we have an unsecured loan of 1,000 to a non-bank which requires a risk weight of 100%. The RWA is €1000*100% =€1000. From this we have an 8% minimum capital requirement RWA=8%*1000 =€80. In other words a bank has to hold €80 in cash for this loan.

Market risk includes general market risk and specific risk. The general market risk refers to changes in the market values due to large market movements. Specific risk refers to changes in the value of an individual asset due to factors related to the issuer of the security. There are four types of economic

variables that generate market risk. These are interest rates, foreign exchanges, equities and commodities. The market risk can be calculated in two different manners: either with the standardized Basel model or with internal value at risk (VaR) models of the banks. These internal models can only be used by the largest banks that satisfy qualitative and quantitative standards imposed by the Basel agreement.

Moreover, the 1996 revision also adds the possibility of a third tier for the total capital, which includes short-term unsecured debts. This is at the discretion of the central banks (Zaher, 2007).

Basel 2

When Basel 2 was established it was based on 3 pillars. Minimal capital requirements, supervisory review and market discipline. The first Basel accord only in part covered these topics, while some were left out altogether. It is much more complex than Basel 1 and its intention is to align the required regulatory capital with actual bank risk. The heart of the new accord is the minimal capital requirement, banks have to have hold capital against 8% of their risk weighted assets. This can be summarized in the following equation

$$Minimal\ capital\ requirement = \frac{Total\ Capital}{RWA\ credit\ +\ (MRC\ market\ \times 12.5)\ +\ (ORC\ \times 12.5)} > 8\%$$

In general there are 3 risk "buckets" in Basel 2: Credit Risk, Market Risk and Operational Risk.

Throughout the years Basel 2 was updated several times with changes to certain risk calculations and assertions. These constant updates played a part in the delay of the global implementation of the accords. In addition each country decided its own way of implementing the accords the way they saw fit. In the United States for instance the implementation was long, slow and highly publicized. Also due to the nature of the Basel 2 accord it would seem that some types of banks get favored compared to others (Big over small).

After the financial crisis struck criticizers of the accords blamed the framework of the accords as in their opinion they actually increased the impact of the crisis on the banks (Harper, 2007).

Basel 3

The new Basel 3 framework does not replace or supersede the first 2 Basel frame works but rather works alongside them. Basel 3 is different in this that is does not hold any relevance to rules of Basel 1 and 2 which were more concerning the required level of bank loss reserves, Basel 3 is more about the "run on a bank" scenario and the reserves a bank needs to cope with those instances.

Under Basel 3 banks are required to hold 4.5% of common equity and 6% of tier 1 capital of RWA. Additionally it introduced a mandatory capital conservation buffer of 2.5% and a discretional counter cyclical buffer which can give national regulators an additional buffer percentage of 2.5 % during high credit growth periods.

Basel 3 also introduced a number of liquidity requirements. One of them was the Liquidity Coverage Ratio, this was meant to require a bank to have sufficient high quality liquid assets in order for the bank to cover it total cash outflow for a period of 30 days. The other liquidity requirement was the net stable

funding ratio, this required the banks to have stable funding in order to hold a bank afloat in a case of one year of continued stress.

Additionally Basel 3 introduced a minimum leverage ratio. Banks were expected to have a leverage ratio of at least 3 %, however the US adapted the rule differently in which their system banks are required to have a ratio of at least 6%.

Additional figures

Tier 1 capital ratio in %

	2005	2006	2007	2008	2009	2010	2011	2012	2013
ABN AMRO	10.6	8.5	12.4	9.4	10.2	12.8	13.0	12.9	15.3
ING Bank	7.3	7.6	7.4	9.3	10.2	12.3	11.7	14.4	13.5
RaboBank	11.6	10.7	10.7	12.7	13.8	15.7	17.0	17.2	16.6
SNS Bank	8.7	8.2	8.4	10.5	10.7	10.7	12.2	7.7	16.6
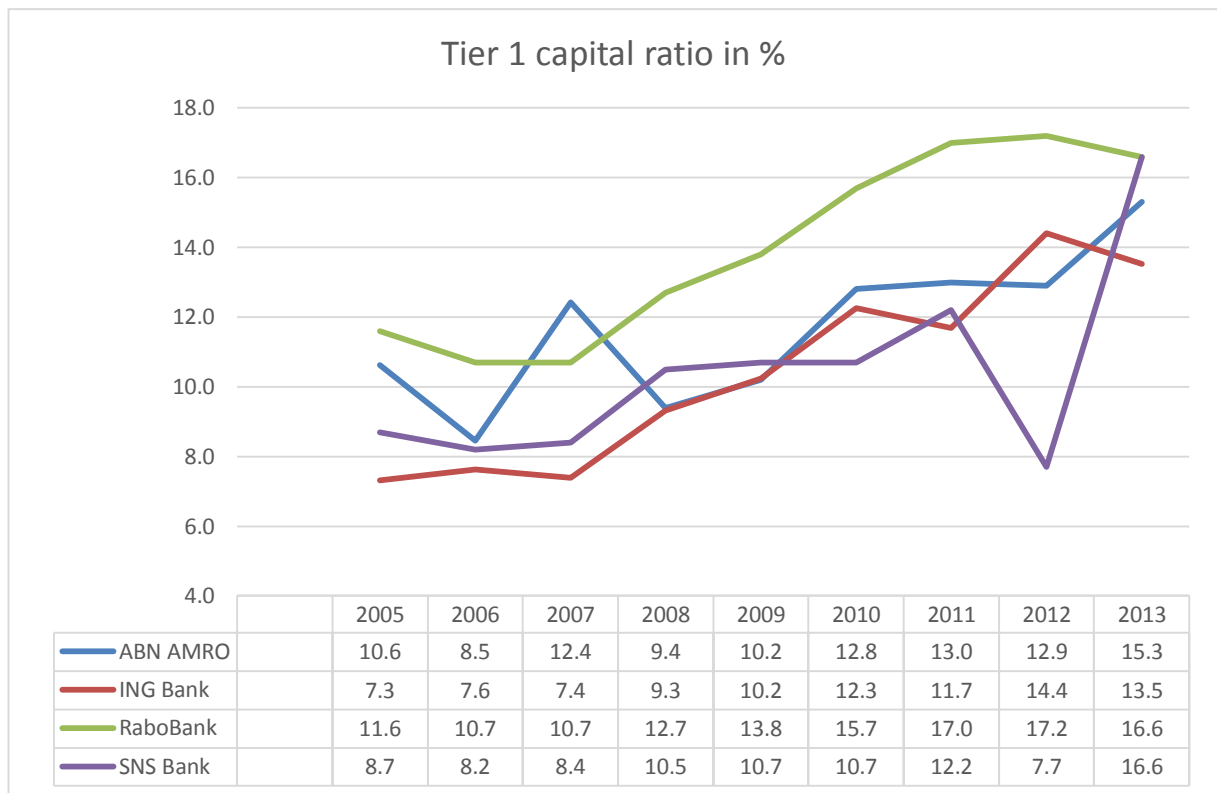
Figure 1: The levels of Tier 1 capital ratio of the 4 system banks throughout the years 2005-2013.

Total capital ratio in %

	2005	2006	2007	2008	2009	2010	2011	2012	2013
ABN AMRO	13.1	11.1	14.6	12.6	14.8	16.6	16.8	18.4	20.2
ING Bank	10.9	11.0	10.3	12.8	13.5	15.3	14.3	16.9	16.5
RaboBank	11.8	11.0	10.9	13.0	14.1	16.3	17.5	19.0	19.8
SNS Bank	11.9	11.2	11.5	14.0	13.9	16.7	14.4	9.3	16.7

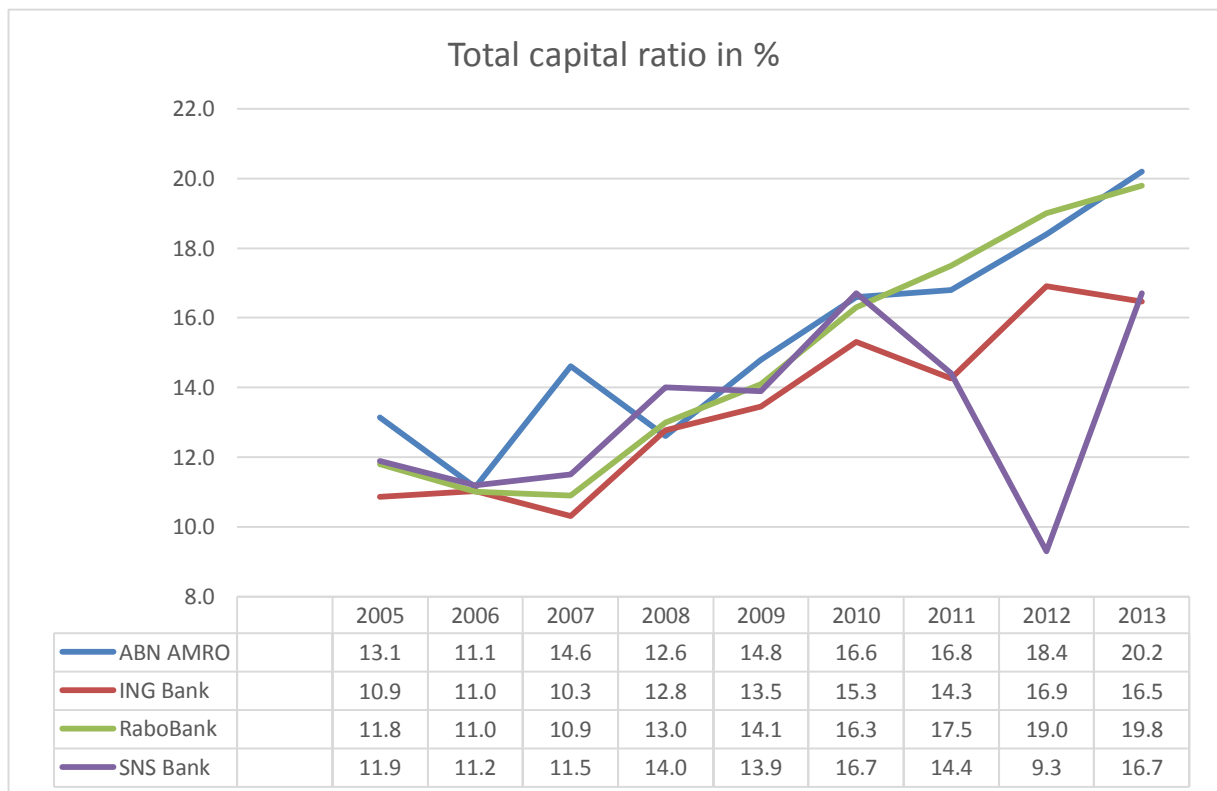*Figure 2: The levels of total capital ratio of the 4 system banks throughout the years 2005-2013.*

Income cost ratio over the years in %

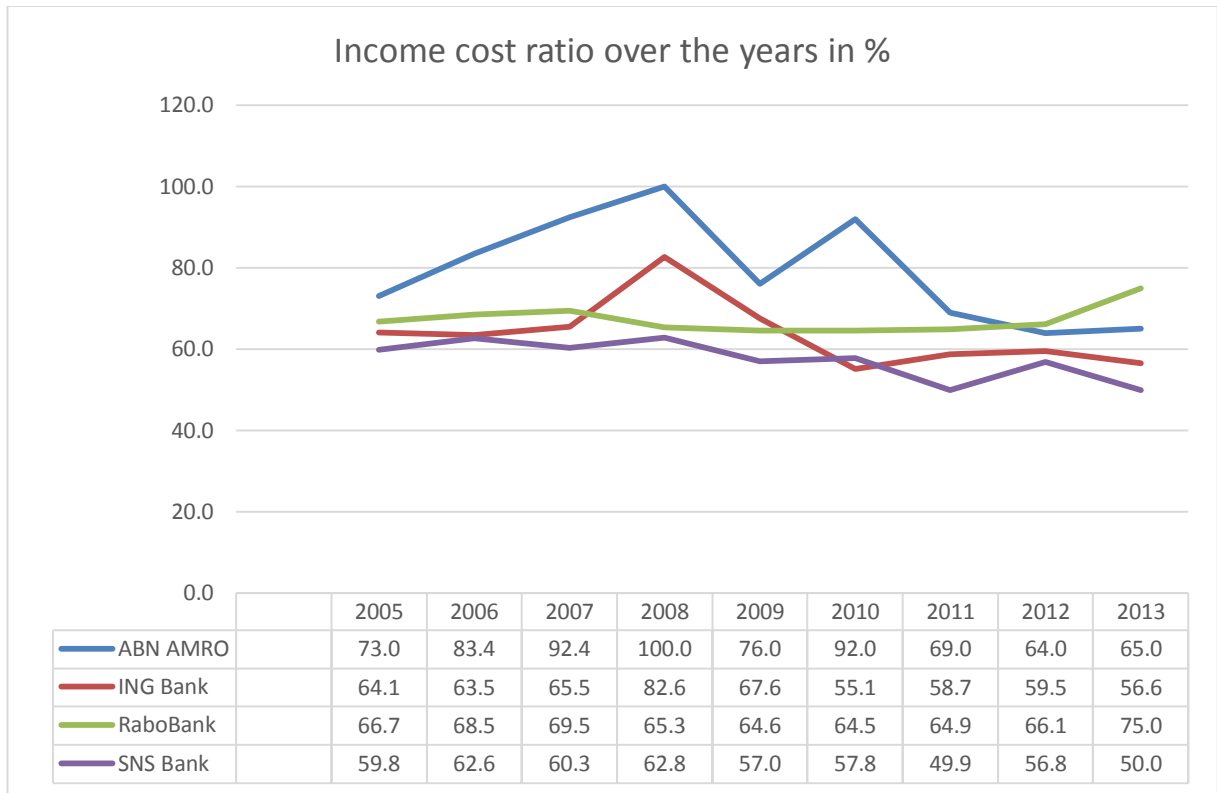|	2005	2006	2007	2008	2009	2010	2011	2012	2013
ABN AMRO	73.0	83.4	92.4	100.0	76.0	92.0	69.0	64.0	65.0
ING Bank	64.1	63.5	65.5	82.6	67.6	55.1	58.7	59.5	56.6
RaboBank	66.7	68.5	69.5	65.3	64.6	64.5	64.9	66.1	75.0
SNS Bank	59.8	62.6	60.3	62.8	57.0	57.8	49.9	56.8	50.0

Figure 3: The levels of income cost ratio of the 4 system banks throughout the years 2005-2013.

Return on equity in %

	2005	2006	2007	2008	2009	2010	2011	2012	2013
ABN AMRO	23.5	20.7	38.4	21.0	-2.7	-3.4	7.8	8.5	8.5
ING Bank	22.9	23.6	17.5	2.3	5.0	13.1	10.9	8.8	11.7
RaboBank	9.7	9.4	10.2	9.7	7.3	8.6	7.6	5.4	5.2
SNS Bank	14.9	14.1	12.6	6.7	-4.6	-27.3	2.2	-53.8	-52.4
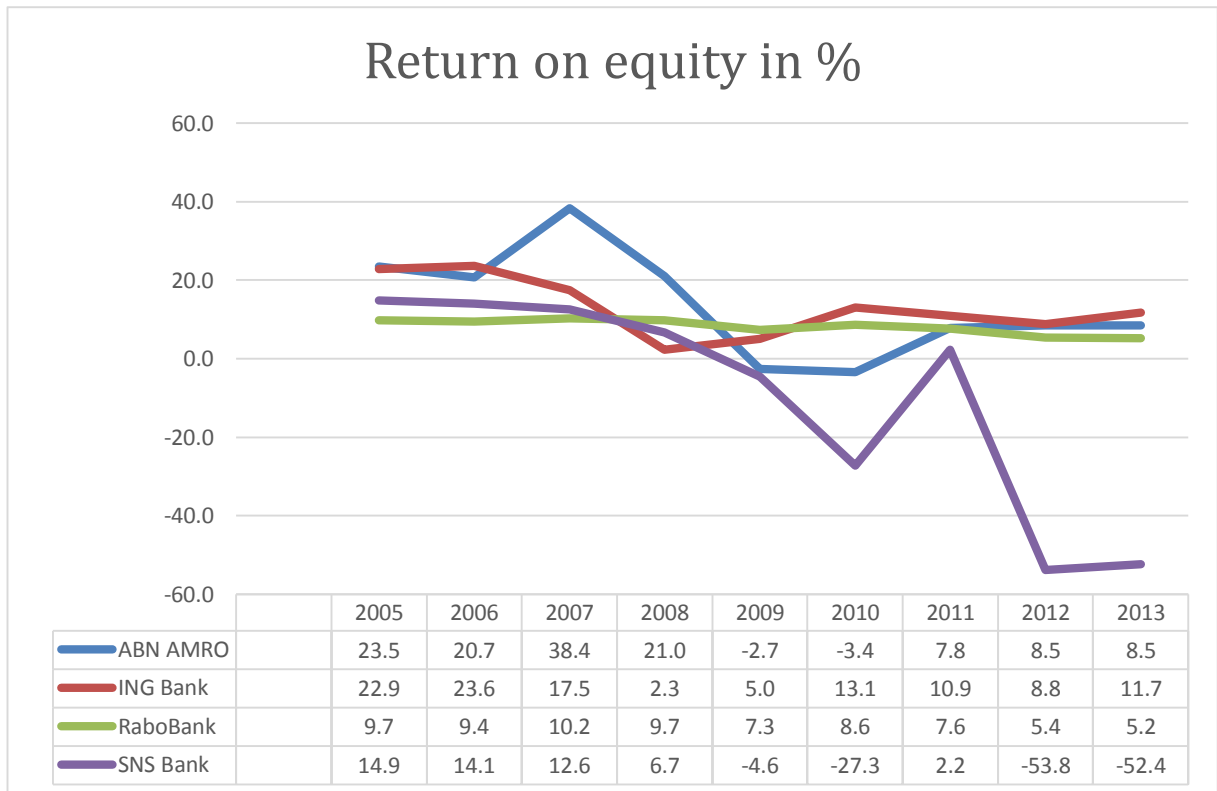
Figure 4: The levels of return on equity of the 4 system banks throughout the years 2005-2013.

Return on assets in %

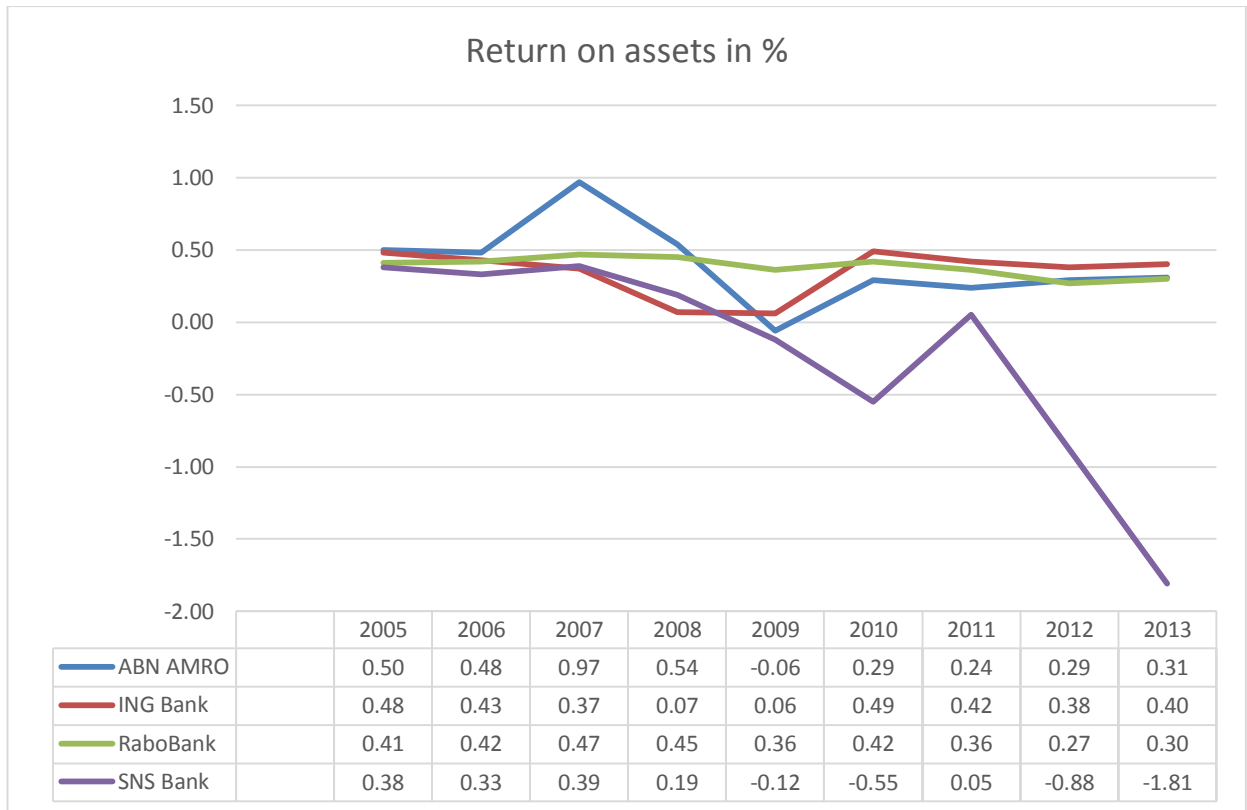|	2005	2006	2007	2008	2009	2010	2011	2012	2013
ABN AMRO	0.50	0.48	0.97	0.54	-0.06	0.29	0.24	0.29	0.31
ING Bank	0.48	0.43	0.37	0.07	0.06	0.49	0.42	0.38	0.40
RaboBank	0.41	0.42	0.47	0.45	0.36	0.42	0.36	0.27	0.30
SNS Bank	0.38	0.33	0.39	0.19	-0.12	-0.55	0.05	-0.88	-1.81

Figure 5: The levels of return on assets of the 4 system banks throughout the years 2005-2013.