Consultancy Report ING

Securing Financial Health

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Management Summary

The question which is answered in this report is how ING's financial health is influenced by the external environment and if there are any potential risks for ING's future financial health. This report analysed the effects of three different external factors, being the GDP, inflation measured by CPI and the interest rates measured by the EURIBOR rates. ING's financial health is based on Liquidity, Solvency, Profitability and Asset Quality. Linear regressions were realized for all the financial health indicators as functions of the external factors. We observed significant positive relations between GDP and profitability, inflation and liquidity, interest rates and liquidity and interest rates with asset quality. At the same time, we observed the solvency of ING is negatively related to inflation and interest rates. Following the forecasts of our external factors in the upcoming years, being a lower GDP, lower interest rates and higher inflation, we expect ING's profitability to decrease. This means ING's financial health is decreasing.

Next to that, due to the COVID-19 crisis the business model of ING is under pressure. Whereas we do not see any empirical evidence for interest rates being a threat, prudential requirements and digital technologies should be considered as serious threats. For that reason, we advise to focus on IT investments to bring down compliance costs, for example by anti-money laundering regulations, and prevent reputational damage. Secondly, we advise to invest in the departments of asset management and institutional and corporate banking, as these departments are not threatened by FinTechs. ING still is in reasonably good health, but a prolonged economic crisis can have consequences we cannot oversee and thus we observe a form of survival risk.

Introduction and problem formulation

ING is a large bank which provides both retail and wholesale banking services in several countries around the world (ING, 2020a). An investigation of ING's total income number shows that around 70 percent of ING's total income is generated in the European Union (ING, 2020a). This indicates that despite ING's international character, most of its banking activities take place in the EU. According to ING's latest annual report of 2019 the bank has 38.8 million customers, and more than 56,000 people are employed by ING (ING, 2020b). ING is a large bank within the EU with, for example, on the asset side 611,765 million euro of loans outstanding (ING, 2020b). The amount of total loans granted is mainly financed with the deposits owned by ING's customers, these deposits have a total value of 574,433 million euro (ING, 2020b). This shows that ING is a large financial intermediary which makes the bank's financial health an important issue for society.

The financial health of ING is not only important given its large role as a financial intermediary. Current developments in the amount of regulation as a reaction to the financial crisis and the recent macroeconomic shock due to COVID-19 virus stress the importance of the bank's liquidity and solvency. Since the financial crisis, regulation has been implemented around the world, including in the EU, as Basel III. This will be further explained in the theoretical framework. Next to current regulation, the COVID-19 virus has influenced the financial position of ING. The bank was forced by the economic downturn to increase its loan loss provision with an additional amount of 421 million euros in the second quarter of 2020 (ING, 2020c). This additional amount is comparable with the total amount of ING's loan loss provision in the fourth quarter of 2019 (ING, 2020c). The COVID-19 virus shows again the strong connection between a bank's financial health and the external environment. Together with the current regulation, the COVID-19 virus makes it important to investigate how ING's financial health is influenced by the external environment and if future uncertainties will become a threat for ING's financial health.

This leads to the following problem statement:

How is ING's financial health influenced by the external environment and are there potential risks for ING's future financial health?

Theoretical Framework

ING's financial health before the COVID-19 crisis. Basel III, which includes post-crisis regulation, the first pillar consists of three regulatory requirements: capital requirements, leverage ratio and liquidity requirements (De Haan, Schoenmaker, & Wierts, 2020). Regarding capital requirements, banks are obliged to finance themselves with 4.5% of common equity (De Haan et al., 2020). For leverage ratio, 3% is required and for liquidity requirements, the total discharge in cash over 30 days should be covered with liquid assets (De Haan et al., 2020). At the end of 2019, ING is financed with 14.6% common equity, the bank's leverage ratio is 4.6% and its liquidity coverage ratio is 127% (ING, 2020d).

The European Banking Authority (EBA) also conducts several stress tests to investigate how a bank's financial health is affected over time when a hypothetical worst-case scenario occurs (EBA, 2020; ING, 2016). The stress test in 2016 shows that ING's common equity is still 9% of the bank's assets at the end of the worst-case scenario (ING, 2016). The most recent stress test in 2018, shows that ING's common equity is still 10.7% of the bank's assets at the end of the worst-case scenario (ING, 2018). The stress test for 2020 is postponed giving room for operational continuity (EBA, 2020).

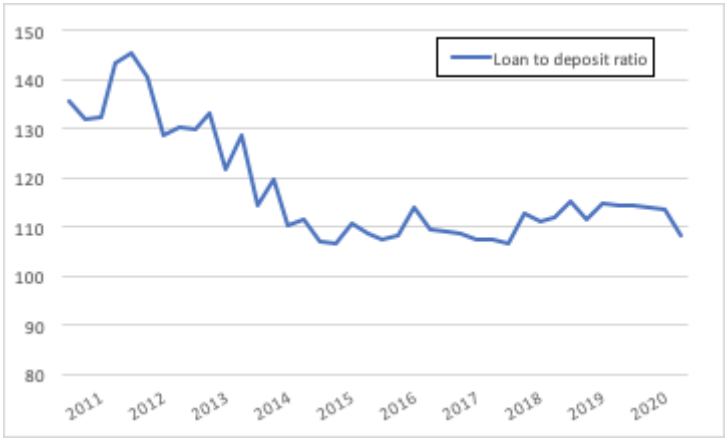
ING's financial health is also investigated by the rating agencies. These credit ratings reduce the information asymmetry between ING and its investors (De Haan et al., 2020). The investors use the ratings to estimate the risk of their investment which determines the required return. At the end of 2019, ING had a A- rating of Standard & Poor's, Baa1 rating of Moody's and A+ rating of Fitch Ratings (ING, 2020b).

ING's financial health according to their liquidity position. In our economy, banks function as a financial intermediary. Depositors deposit their capital to banks and the banks use this capital to give out loans. These loans have a high degree of private information and are hard to market and should be monitored in order to make the odds of repayment as high as possible (De Haan et al., 2020). Banks provide this service and in return get profits from the difference in interest they charge on their loans and pay to their depositors. The management of these loans and deposits is necessary for a bank to achieve financial balance (Ruozi & Ferrari, 2013).

A metric that addresses this management is the *loan to deposit ratio*. It represents how much of the loans given by a bank are financed with the capital of depositors; a higher ratio means that a bank relies less on funds from depositors and more on acquired in alternative ways. This also means a bank may not have enough liquidity to cover unforeseen fund requirements.

Jorda et al. (2017) find that a higher loan to deposit ratio leads to more credit risk for banks. This is intuitive, because a bank that gives out a higher amount of loans for a set amount of deposits that they hold, will be more likely to not repay depositors.

ING's loan to deposit ratio has been decreasing notably over the last 10 years. This means ING finances a larger part of their loans using depositor capital. The bank thus has more deposits compared to the loans that they give out. This implies that ING is improving its liquidity position and increases their ability to repay their depositors.



GRAPH 1: Loan to deposit ratio of ING. *The loan to deposit ratio of ING is plotted from September 2010 until June 2020. The data is quarterly and retrieved from FactSet.*

ING's financial health according to its asset quality. Bongini et al. (2001) argue that an increase in loan loss reserve over capital, which is calculated as:

Loan loss reserve/ (equity + loan loss reserve),

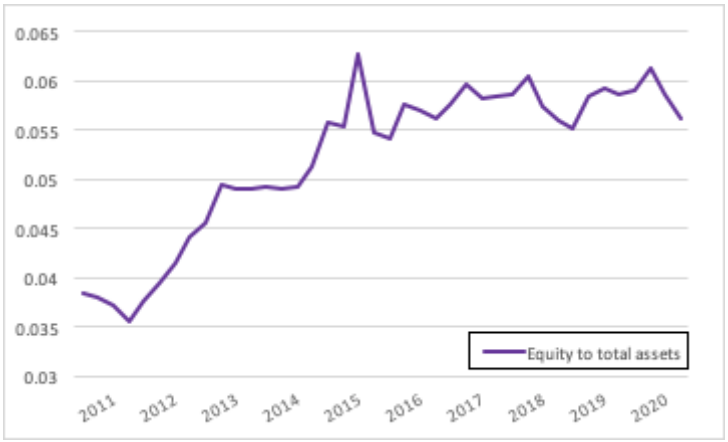
is a signal of a higher chance that a financial institution is in distress and therefore a worse asset quality. The rationale behind this is that a build-up in reserves serves as cover for the potential default of risky assets. Consequently, this is an adequate measure for the asset quality of a bank, in this case ING. A lower loan loss reserve over capital corresponds to a higher asset quality. Bongini et al. (2001) note that a decrease in this variable is also a sign of the management of a financial institution being more prudent, this gives this variable a double interpretation.

It should be noted that research has found that increasing and decreasing loan loss provisions has been used by banks as a way to manage earnings (Ahmed et al. (1999)). This would make loan loss provision over capital of ING as a measure for asset quality hard to interpret and give biased results in regression analyses. However, Leventis et al. (2011) find that the implementation of IFRS in 2005 has mitigated earnings management using loan loss provisions. Our data starts from 2005, thus we argue that our data is minimally influenced by the tendency of managers to engage in earnings management.

ING exhibits a small increase in its loan loss reserve over capital ratio in Q2 2020. The downturn in GDP of the countries where ING is active results in more credit risk from their clients, which is a possible explanation for this increase. This will further be examined in Section 2. Graph 2 plots the loan loss reserve over capital over time.

GRAPH 2: Loan loss reserve over capital of ING. *Loan loss reserve over capital, which is calculated as: loan loss reserve/ (equity + loan loss reserve), is plotted over time from September 2010 until June 2012. The data is quarterly and obtained from FactSet.*

ING's financial health according to its solvency. Solvency is defined as a firm's ability to meet its long-term debts, and a firm that is not able to meet its long-term debt is declared bankrupt. Since equity is calculated as a firm's total assets minus total debt, equity is a protection against sudden decreases in a firm's assets and sudden increases in a firm's debt. This is especially relevant to banks due to their relatively high debt positions. The equity to total assets ratio measures the amount of protection offered to a bank (or other firms) by its equity (Fernándes-Arias et al., 2017). ING has been steadily increasing its equity to total assets ratio over the past 10 years, indicating an increasing ability of ING to meet its long-term debts. A small decline in the ratio occurs in Q1 and Q2 of 2020.



GRAPH 3: Equity to total assets of ING. *Equity to total assets is plotted over time from September 2010 until June 2020. The data is quarterly and retrieved from Factset.*

ING Financial Health according to stakeholders. The profitability of a modern bank depends on income generated by lending activities and the bank's intermediary role for several capital market transactions such as for example a seasoned equity offering (De Haan et al., 2020). Income from lending activities depends on a borrower's financial position. When the borrower's financial position becomes worse, the bank must write down the loan or a part of it which leads to a decrease in the bank's profitability (De Haan et al., 2020). Finally, the bank's profitability is also affected by the operational costs such as IT costs, personal costs and cost related to compliance (Oracle, 2017). Controlling these types of costs is given the low interest environment an important task for banks (Oracle, 2017).

To investigate ING's profitability, we used the return on assets ratio (ROA) and the return on equity ratio (ROE). These ratios are also used by previous research and using these two ratios shows the influence of the bank's capital structure on the profitability (Athanasoglou, Brissimis, & Delis, 2005). The following formulas show the operationalization of the two ratios:

$$Return\ on\ Assets: Net\ Income\ incl\ Disc.oper\ after\ tax\ /\ Avg\ Total\ Assets$$
$$Return\ on\ Equity: Net\ Income\ incl\ Disc.oper\ after\ tax\ /\ Avg\ Shareholder's\ Equity$$

When looking into the financials of ING the following can be found: The return on assets declined significantly from 0.5 to 0.3 in Q2 of 2020. Furthermore, the average return on assets has been 0.5 and not below 0.4 for the last five years before this quarter, in which the COVID-19 crisis was present. A similar development can be found in the ROE: in Q2 2020 the ROE dropped from 8.1 to 6.0, compared to a five-year average of 9. Both ratios are driven by a drop in the net income of ING. in Q2 2020 the net income dropped from -5.7 million to -30.6 million euros. This is low compared to the five-year average of 19.2 million euros.

Effect of External Factors on ING Financial Health. The growth of the economy is related to the financial health of a bank. When the economy is growing, the profits made by a bank will increase (Petria, Capuraru, Ihnotov, 2015). The first reason is that in a period of positive economic growth the total demand for bank loans increases (Petria, 2015). In a period of positive economic growth, the customers' financial position will become better which makes it possible to borrow additional money for extra consumption (Mankiw & Taylor, 2014). The companies which produce goods and services make more profit due the higher demand and will decide to expand their business. The expansion of the business increases the demand of bank loans to finance the investments related to the expansion (Mankiw & Taylor, 2014). When the economy is characterized by negative economic growth, there is a decrease in customer spending and investments made by the companies (Mankiw & Taylor, 2014). This means that the demand for bank loans by customers and companies decreases (Petria et al., 2015).

The second reason is related to the assets of a bank (Sufian & Chong, 2008). In a period with negative economic growth the expected value of the future cash flows of the bank's assets decrease. The reason is that the borrowers' financial position becomes worse and the value of the underlying collateral decreases (Archarya, Yorulmazer, & Shin, 2009; De Haan et al., 2020). As a result, the bank must write down the value of its assets which affects its profitability, liquidity, solvency and asset quality (De Haan et al., 2020; Trujillo-Ponce, 2013). Positive economic growth has the opposite effect and leads to an improvement in the borrower's financial position and the value of the collateral increase (De Haan et al., 2020). The bank also can increase its lending capacity due to the improvement in the value of its assets which results in a higher profitability (De Haan et al., 2020). We therefore do not only expect a positive relation between the gross domestic product (GDP) and ING its profitability, but also between GDP and ING its liquidity, solvency, and asset quality.

The growth of the economy is operationalized as the quarterly growth of the GDP of all the member states of the EU (Petria et al., 2015). The data of all member states of the EU is used because this is ING's main market (ING, 2020a). To prevent the influence of inflation, we use not the GDP based on market prices. Instead, we use the GDP stated in real terms where the GDP in 2010 is set equal to 100. The data is retrieved from Eurostat database.

Molyneux and Thorton (1992) find the nominal interest rate as a positive determinant of the profitability of EU banks. When the interest rates rise, the net interest margin is affected: *Net Interest Margin = Loans*Rl + Reserves*Rf - D*Rd - C, with Rl as loan rate, Rf as risk free rate, Rd as deposit rate and C as the cost of the loans granted* (De Haan et al., 2020). When the interest rate increases, the loan rate (*Rl*) will increase as well, since customers are willing to pay

a higher interest rate and this will increase a bank's absolute profits (Alessandri & Nelson, 2015). The formula of the interest margin can be extended, by adding next to the deposits, other types of funding sources (Alessandri & Nelson, 2015). As the bank's financing costs have a short-term rate and *Rl* is a long-term rate, profitability could go down in the short term. However, with a strong negotiation position, the bank can make sure the increase in interest rates paid for financing costs is relatively lower than the increase in interest rate that is paid to the bank for loans (Alessandri & Nelson, 2015). This leads to an absolute increase in profitability for the bank in the long run (Alessandri & Nelson, 2015). Together, these effects lead to a positive long-term effect on the bank's profitability. The interest rate is negatively related to the bank's liquidity and solvency. The reason is that the bank's assets have a longer duration in comparison with the bank's debts (DeHaan et al., 2020). This means that an increase in the interest reduces the present value of the bank's assets more in comparison with the bank's liabilities. The interest rate is operationalized as the 3-month EURIBOR interest rate. Given these findings in prior literature, we expect a positive relation between the EURIBOR and ING's profitability and a negative relationship between ING's liquidity and solvency.

The inflation is also a macroeconomic variable which is directly related to the financial health of a bank (Petria et al., 2015). Banks have certain expectations about the future rate of inflation and will adjust the interest rate upwards based on these expectations (Petria et al., 2015). When the interest rate is not adjusted for inflation, the bank's operational costs will increase due to the inflation which reduces the profitability of the bank (Petria et al., 2015). Furthermore, the bank's total profit can even increase when the interest payments are faster adjusted for the expected rate of inflation by the bank than the bank's costs increase due to the actual inflation (Trujillo-Ponce, 2012). Based on these findings by previous research we expect the possible negative effects by such events to be outweighed by the positive effect from the higher nominal interest rate as a result of the higher inflation.

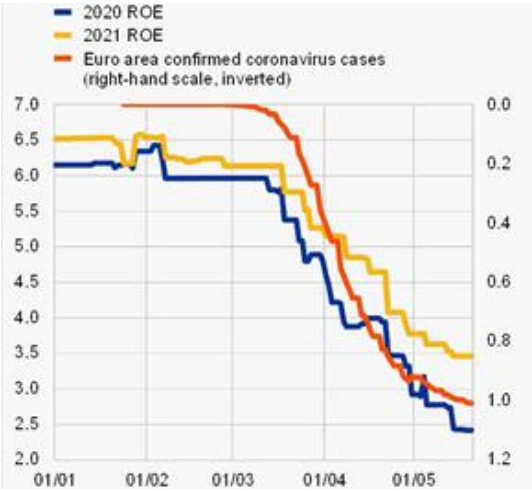
The inflation can also affect the liquidity, solvency, and asset quality of a bank (Schwartz, 2002). The reason is that the inflation also leads to an increase in the value of the collaterals behind the loans which are granted by the banks (Schwarts, 2002). When the inflation rate for these assets decreases or becomes even negative, the recoverable amount of the assets decreases (Schwarts, 2002). As a result, the bank must write down a part of the loans which lead to an increase of the loan loss reserves and decrease of the bank's asset quality, liquidity, and solvency (Schwarts, 2002). Therefore, we expect that the inflation rate is positive related to the bank's liquidity, solvency, and asset quality.

The inflation is operationalized as the quarterly change in the customer price index (CPI). This operationalization is based on the aggregated CPI for all the members of the Organization for Economic Cooperation and Development (OECD) in the EU. The CPI data is retrieved from the OECD database.

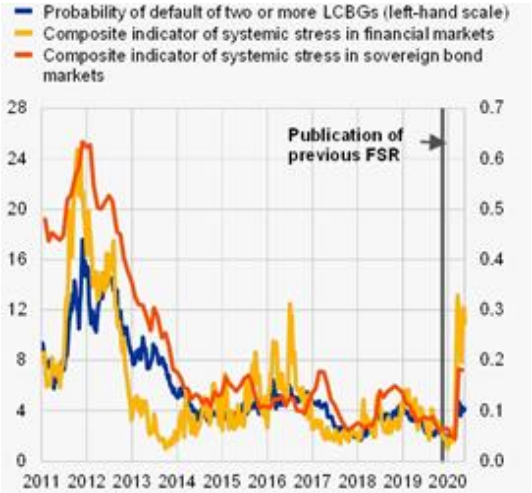
ING Financial Health according to Social Environment. Finally, ING's financial health is also influenced by the reputation of the bank. These two concepts are related, because the bank cannot operate when the stakeholders do not trust the bank (Farina, Gabbi, & Previati, 2014). Furthermore, potential clients cannot observe the bank's services before they use them, which makes the bank's reputation an important factor for the client's decision between banks (Babić-Hodović, Mehić, & Arslanagić, 2011). The bank's reputation is also closely related to corporate social responsibility which is currently an important topic for banks (Farina et al., 2014). ING was for example recently in the news about its supporting role in money laundering practices by clients of its polish subsidiary (FD, 2020). This was not the first time that the bank was involved in money laundering practices. The bank was also involved in money laundering practices between 2010 and 2016 which resulted in a fine of 775 million euro (FIOD, 2018). The direct costs related to the fine are costly for the bank's profitability. However, the indirect costs related to the bank's reputation are not only costly for ING's current profitability but can also reduce ING's competitive advantage (Farina et al., 2014).

Impact of COVID-19 on Banking Sector. The ECB released their half-yearly Financial Stability Review in May (ECB, 2020). This report went in depth on the effects of COVID-19 on the financial sector. As it was published in May 2020, it does not contain all the latest information. Nevertheless, the report still included some interesting and important conclusions. They saw a decrease in ROE in the banking sector for the months January to May, they saw this decrease happening at the same time as the coronavirus cases increased.

What also came apparent in the Financial Stability Report is that the systemic risk in financial markets has spiked up. It has not reached the levels of the financial crisis of 2011, but it is the highest that it has been for the last 5 years.



GRAPH 4: Evolution of ROE forecasts for listed banks (OECD, 2020), *from 1 Jan 2020 to 20 May 2020; in percentages; million confirmed cases. In the graph we see that the downfall of forecasted ROE started at the same time as COVID-19 cases started to accumulate.*



GRAPH 5, CISS, SoVCISS and the probability of default of two or more banking groups (OECD, 2020), *from January 2011 to May 2020; CISS: two-week moving averages; probability of default: percentages. In the graph we see that the probability of default has gone up in 2020, same for the CISS and SoVCISS.*

The pandemic has a worldwide effect on the economy and will this continue in the foreseeable future. In a paper by Carletti at al. (2020). they evaluate the consequences of the pandemic on the existing banking model. They argue that the current banking model without the COVID-19 crisis is almost if not already overdue. In their paper, they mention three forces that have caused this; sustained low interest rate, increased prudential requirements and quick adoption of digital technologies. The low interest rate has the effect that it lowers the profitability of a financial institution as we have discussed before. The increased prudential requirements have the effect that the banks' profits are under more pressure due to increased cost of compliance and lessened competitiveness relative to shadow banks. The quick adoption of digital technologies has led to a huge increase in Fintech and BigTech firms. These firms have introduced new products and services that decreased the banks competitiveness and therefore profits (Carletti et al., 2020). The impact of these forces was already visible before COVID-19, but the crisis has caused it to accelerate. Therefore, Carletti et al. (2020) argue that banks need major reforms and deep cutting restructuring to stay efficient. Their conclusion is that banks need to focus on superior information and screening technologies, leaner operations, and less leverage. As these are the fields where banks can remain efficient and thus stay ahead of Fintech and BigTech companies.

Methodology

In order to deepen our understanding of the effect of the external factors on the financial health of ING, the external factor variables are regressed on the financial health variables. Variables of both kinds are transformed logarithmically as ln (x). As the EURIBOR interest rates also contain negative values, these are transformed by adding 1 to the interest rates before taking the log. This makes it possible to interpret the coefficients as percentage changes and has the added benefit of making the data closer to a normal distribution. As quarterly data was most accessible on FactSet and other data sources we use quarterly data for our report. The data used is from ING Groep, as for ING Bank not all data was available. Then, all financial ratios are regressed on the three different external factors being the GDP, inflation, and interest rates. The financial ratios and external factors are measured by the following proxies:

GDP - GDP EU 27	*Inflation - CPI OECD Europe*
Interest rates - Euribor 3 months	*Liquidity - (Loan to Deposit ratio) * -1*
Solvency - Equity / Total Assets	*Profitability - ROE and ROA*

*Asset Quality - (Loan Loss Reserve / (Equity + Loan Loss Reserve)) *-1*

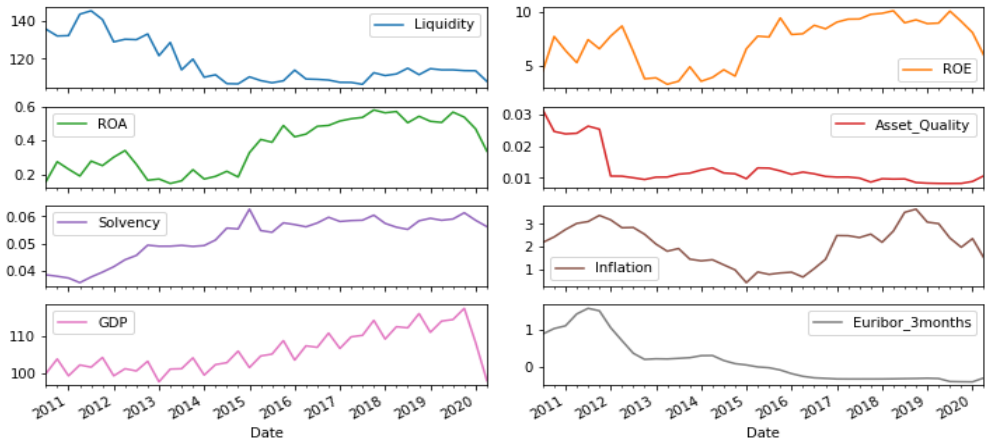
Where loan to deposit ratio and loan loss reserve/equity + loan loss reserve is multiplied by -1 so positive values represent good financial health. The general regression that is run, with t in quarters, is the following:

$$InternalFactor_t = c + \beta_1 GDP_t + \beta_2 Inflation_t + \beta_3 Euribor_t + \varepsilon_t$$

To interpret the relationship between the internal variables additional regressions can be run with the internal variables as control variables, but this is for future research and falls beyond the scope of this report.

Results

ING's financial health is evaluated using four different financial indicators: Liquidity, Profitability, Asset Quality and Solvency as measured by the ratios given in the previous section. First the timelines of the indicators and the external factors are checked to observe any individual trends, afterwards their correlations are assessed and to be most precise regressions are run as well to check if any statistically significant relations exist.



GRAPH 5: development of variables. *The financial health indicators and the external factors used in this study are plotted over time. The financial health indicators are: liquidity, ROE, ROA, asset quality and solvency. Liquidity is captured by loan loss reserve over capital and calculated as loan loss reserve$_t$ / (equity$_t$ + loan loss reserve$_t$). Solvency is captured by equity$_t$ over total assets$_t$. Liquidity is captured by loans$_t$ divided by deposits. The external factors are inflation, GDP and the three-month EURIBOR. Data for all financial health indicators is retrieved from FactSet. Inflation is retrieved from OECD, GDP is retrieved from Eurostat and the three-month EURIBOR is retrieved from the EMMI (European Money Market Institution) database. All data is quarterly.*

Financial ratios. The financial health indicators as discussed in the theoretical framework are shown in graph 3. Most noteworthy is the decline of the profitability in the last couple of quarters due to the COVID-19 crisis.

External factors. Also, for the GDP this same decline due to the COVID-19 crisis is visible, whereas the overall trend of the GDP was increasing until Corona hit. The interest rates have been declining for a while after which they have been around zero and they are expected to remain at this level for the upcoming years. The Inflation seems to be fluctuating a lot over the past couple of years.

TABLE 1: Correlations Matrix of Internal and External Factors. *Liquidity, ROE, ROA, asset quality and solvency are the financial health indicators used in this study and are retrieved from FactSet. Liquidity is captured by loan loss reserve over capital and calculated as loan loss reserve$_t$ / (equity$_t$ + loan loss reserve$_t$). Solvency is captured by equity$_t$ over total assets$_t$. Liquidity is captured by loans$_t$ divided by deposits. Inflation, GDP and the three-month EURIBOR are the external factors that are used in this study. GDP is retrieved from OECD, the three-month EURIBOR is retrieved from EMMI and inflation is retrieved from Eurostat. All data is quarterly.*

	Liquidity	ROE	ROA	Asset_Quality	Solvency	Inflation	GDP	Euribor_3months
Liquidity	1	0.3	0.53	0.7	0.88	-0.53	0.44	-0.87
ROE	0.3	1	0.94	0.28	0.46	0.25	0.74	-0.43
ROA	0.53	0.94	1	0.48	0.7	0.13	0.84	-0.68
Asset_Quality	0.7	0.28	0.48	1	0.8	-0.17	0.43	-0.82
Solvency	0.88	0.46	0.7	0.8	1	-0.37	0.65	-0.94
Inflation	-0.53	0.25	0.13	-0.17	-0.37	1	0.21	0.3
GDP	0.44	0.74	0.84	0.43	0.65	0.21	1	-0.63
Euribor_3months	-0.87	-0.43	-0.68	-0.82	-0.94	0.3	-0.63	1

Following the development of the chosen financial indicators and the external factors in the first part of the results, their correlations can be observed in table 1. to check whether patterns between the indicators and external factors are correlated.

The liquidity of ING seems to be influenced the most by the interest rate and secondly the inflation, seen by the high positive correlations. On top of that the liquidity seems to be negatively correlated with the GDP. The profitability seems especially to be positively correlated with the GDP and negatively correlated with the interest rate. The asset quality seems to be positively correlated with the interest rate and moderately negatively correlated with the GDP. Finally, the solvency seems to be highly negatively correlated with the interest rate and positively correlated with the GDP.

Results of linear regressions. To further investigate the relations between the financial indicators and the external factors different OLS regressions are run as explained in the Methodology section. The estimations of the linear regressions reveal several notable statistical relations.

TABLE 2: Time Series Regression Analyses. *This table presents coefficients resulting from five different time series regressions of external factors on financial health indicators of ING given by the equation* $InternalFactor_t = c + \beta_1 GDP_t + \beta_2 Inflation_t + \beta_3 Euribor_t + \varepsilon_t$. *Liquidity is captured by loan loss reserve over capital and calculated as loan loss reserve$_t$ / (equity$_t$ + loan loss reserve$_t$). Solvency is captured by equity$_t$ over total assets$_t$. Liquidity is captured by loans$_t$ divided by deposits. The external factors are on the y-axis and are retrieved from OECD, Eurostat, and EMMI. The financial health indicators are retrieved from FactSet. All data is quarterly.*

	ROE	ROA	Liquidity	Solvency	Asset_Quality
Intercept	-19.67***	-24.08***	-4.19***	-3.79***	12.41**
	(6.35)	(6.52)	(1.00)	(1.08)	(5.19)
Inflation	0.04	0.01	-0.06***	-0.08***	0.09
	(0.09)	(0.09)	(0.01)	(0.02)	(0.07)
GDP	4.63***	4.93***	-0.11	0.19	-1.72
	(1.37)	(1.40)	(0.22)	(0.23)	(1.12)
Euribor_3months	-0.02	-0.37**	-0.16***	-0.31***	-0.78***
	(0.15)	(0.15)	(0.02)	(0.03)	(0.12)
R-squared	0.47	0.68	0.81	0.93	0.66
No. observations	40	40	40	40	40

Standard errors in parentheses.
* p<.1, ** p<.05, ***p<.01

Regarding the first financial indicator, there is a notable positive relation between the profitability of ING, measured by ROE and ROA, and GDP. This implies that gains in national wealth of the different countries in the EU translate to a higher profitability of ING. According to the model in table 2, a 1 percent increase in GDP leads to a remarkable increase of roughly

5 percent in ROE and ROA. This is in line with the existing literature discussed in the theoretical framework. As also observed in the correlations, the ROE is negatively related to the interest rate, but this effect is not as statistically significant as the GDP relation. The significant negative relation of the EURIBOR with ROA is remarkable, as the research on prior literature resulted in the expectation of a positive relation between the EURIBOR and the profitability of ING. However, research by Boto Garcia, David & Álvarez, Antonio & Baños-Pino and José (2018) has shown similar effects by investigating quarterly data in Spain between 1995 and 2016. This effect is justified by the capacity of banks to reduce their liability rates faster than their asset rates. Inflation was expected to have a positive effect on the profitability of ING, and therefore to share a positive relation with ROE and ROA. This is confirmed by the estimations in table 2, although the coefficients of both ROE and ROA are not statistically significant.
Secondly, liquidity is considered. The positive relation that was expected between GDP and the liquidity of ING, which is represented by the loan to deposit ratio, is not present. However, the negative relation that is found is not statistically different from zero and bears little information. Inflation has a significantly negative effect on liquidity which is in line with the hypothesis given in the introduction based on research by Schwarts (2002), the interest rates are also significantly negatively correlated with the liquidity of ING. Then the solvency of ING is checked. It is significantly negatively correlated with the inflation which is not in line with the hypothesis by Schwarts (2002). It is also negatively correlated with the interest rates, whereas it is not statistically correlated to the GDP. Lastly, the asset quality is considered. No statistically significant relation is found between GDP or inflation with asset quality. The interest rates, however, are negatively correlated with asset quality.

Overall, given the high and significant intercept results, the financial indicators are clearly influenced by a lot more external factors, or internal factors like the size, than the ones considered in this report which is not surprising due to the complex dynamics of the financial system. Next to that, other internal variables like the financial health indicators used in this report could also be used as control variables to interpret the relationship between the internal variables, but as mentioned in the methodology this is a suggestion for future research. Also, more advanced ratios or combinations of ratios could be used to ensure that the financial ratios are measured more precisely. However, conclusions can be made using the external factors discussed in this report. The fact that GDP growth is positively related, significantly, or not significantly, with profitability and solvency is in line with findings in current literature (De Haan et al., 2020). The four financial health indicators are all affected by changes in the external factors considered in this report.

Conclusion/Recommendations

Our final recommendation for ING is based on a few pillars. First it addresses the threat of a potential credit downgrade. Then, the claim by Carletti et al. (2020) that the banking sector will face deep and speed restructuring as a result of COVID-19 is discussed. Finally, based on the development of the external factors in the following years potential concerns for ING's financial health are mentioned. Based on these points a final advice is given.

Potential credit rating downgrade. With a credit rating, a signal is given on the creditworthiness and robustness of a firm to whoever is interested. A credit upgrade or downgrade can also have an effect on the capital structure. For example, studies show that institutions close to a rating already issue less debt in comparison to equity. An explanation for this is that an institution wants to show that it is financially healthy (Kisgen, 2003). It is also shown that this happens after a firm has been downgraded. This is in order to reach the old grade of investment again. When this old grade has been reached, more debt will be issued again (Krichene & Khoufi, 2016). This shows that these credit ratings influence the capital structure of the firm. For ING, this would mean they would increase equity financing. This increases the asset quality and increases the solvency as measured by our financial ratios. Also, when CRA's announce a downgrade, probability of default will go up and interest rates on bonds will increase (Baum et al., 2016). This leads to increasing interest payments on the bank's debt which results in a lower profitability (ROE and ROA drop). The threat of a downgrade on ING's credit rating becomes realistic due to the current COVID-19 crisis. The credit rating agencies Standard & Poor's and Moody's had already downgraded ING's short-term ratings with one level (ING, 2020d).

Advice considering Carletti et al (2020). What makes the COVID-19 crisis different from earlier crises, is that earlier crises were caused by financial imbalance and policy response. The current crisis is caused by a sharp decline in economic activity. As we have discussed before, ING was in reasonably good health, but a prolonged economic crisis can have consequences we cannot oversee and thus we observe a form of survival risk. Our main advice that we want to give to ING is based on the finding of Carletti et al. (2020). In his paper, he argued that the business model of a bank is outdated, and it needs to specialize to keep efficient. We agree with this as we see prudential requirements and digital technologies

as serious threats for ING. The third potentially dangerous development, low interest rates, does not show any direct empirical effect on the profitability of ING, therefore we advise to focus on the other two threats. Banks will have to adjust how they provide financial services in face of the greater competition, importantly from new entrants, and related pressures on profitability. As seen in table 3, retail banking and payments are especially affected by the rise of FinTech. For that reason, we advise ING to focus on asset management and institutional and corporate banking. Next to that, to tackle the challenged business model due to prudential requirements we advise ING to focus on anti-money laundering and the use of AI in this area to decrease compliance costs and additional reputational damage.

TABLE 3, The importance of specific financial services for banks' earnings (OECD, 2020). In the table can be seen the different banking activities and the risk introduced by FinTech companies.

Activity	Affected	Risks
Retail banking: credit, deposit, insurance (life and P&C), brokerage	√√	$1745 billion
Institutional, corporate: credit, deposit, insurance (life and P&C)	√	$1525 billion
Payments (retail and wholesale)	√√√	$715 billion
Asset management, wealth management	√	$670 billion
Investment banking (underwriting; M&A, advice, etc.)	√	$215 billion
Capital markets, foreign exchange (trading FICC (fixed income, currency, commodities); clearing, settling, custody, etc.)	√	$140 billion

Future developments in the external environment. The development of the GDP of the EU is uncertain. The OECD expects that the GDP of the EU will decrease as a result of the COVID-19 virus with 7.9% in 2020 (OECD, 2020). This is a sharp decline compared to 2019 where the GDP of the EU increased with 1.9% (OECD, 2020). The OECD predicts that the GDP of the EU will increase with 5.1% in 2021, but making an accurate projection is difficult (OECD, 2020). The reason is that the GDP growth depends on uncertain factors such as the length of COVID-19 crisis and the development of a vaccine (OECD, 2020).

The ECB expects that the inflation rate will increase from 2020 to 2023 (ECB, 2020). The current inflation rate is 0.3% for the EU and this will increase to 1.3% in 2022 (ECB, 2020). This inflation rate is still significantly lower than 2% which is in line with the ECB's monetary goal of price stability (De Haan et al., 2020). Furthermore, the projections of the inflation rate contain the same uncertainty as the GDP growth, because the inflation is closely related to the demand for goods and services (ECB, 2020).

The ECB also has formulated an expectation about the interest rate in the EU. The ECB expects that the three-month Euribor interest rate will decrease from -0.4 in 2020 to -0.5 percent in 2021 and 2022 (ECB, 2020). This indicates that it is expected that ING also must operate in a low interest environment in future years.

Future challenges for ING. To address the potential concerns about future earnings, asset quality and credit risk, it is important to mention the negative and uncertain forecasts of the GDP in Europe, due to the COVID-19 crisis, and the low interest rates in the upcoming years. Due to the negative forecasts of the GDP, the profitability of ING will decrease as we have seen that this is significantly correlated with the GDP in our results. ING should be wary of this and its implications and communicate this to its investors. Regarding the asset quality, we found that this is negatively correlated to interest rates. As the interest rates will probably remain low for a while, this means the asset quality will not deteriorate further due to the interest rates. However, our empirical analysis was done in a period without a crisis, the current crisis might have the effect of asset quality deterioration. As a report from the ECB shows that multiple banks have made provisions for the uncertainty around asset quality (European Central Bank, 2020). For the inflation, we find that ING's liquidity and its solvency will decrease when the inflation rate will increase as expected. ING's current solvency position offers room for more debt, but the management of ING should make a conscious choice whether they want to take measures to keep improving their solvency position, or to keep it constant. Due to the uncertain periods ahead the credit risk will also increase, as the probability of default increases. As ING will face more challenges in the future regarding their future earnings, asset quality and credit risk, it is important to have a buffer which is large enough to cope with potential losses.

Concluding, our advice for ING for the following three years is to tackle the outdated business model by focussing on the challenges faced by prudential requirements and digital technologies. This can be done by enhancing the regulatory department for anti-money laundering, by investing in IT, to bring down the compliance costs and save ING's reputation from additional damage. Next to that, based on the development of the external factors in the following years, the main focus should be on increasing the profitability and asset quality as these are severely damaged by the forecasts. We advise ING to invest in the departments of asset management and institutional and corporate banking, since these are not affected by the rising FinTech and BigTech competitors.

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