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# What Determines Bank Lending Standards in Cyprus?

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**Abstract**

We study, for the first time in the existing literature, how lending standards and demand for loans affect and are affected by other macroeconomic factors in Cyprus. The results suggest that only house prices appear to affect lending standards, with a positive house price shock causing a tightening. House prices have the opposite impact on demand for loans, with an increase in the former having a positive effect on demand, while demand is inversely affected by the lending rate. Lending standards have a strong impact on the economy, as they register an effect on lending rates and loan growth, and subsequently on GDP. This highlights the importance of credit availability in the economy.

**Keywords:** bank lending standards, macroeconomic factors, vector-autoregression model.

## 1. Introduction

Banks are the key providers of funds in most advanced economies (Hartmann et al., 2003; Allen et al., 2008). Therefore, it is crucial to understand the factors affecting their decisions with regards to loan granting. In contrast to changes in the interest rate, which affect mostly the demand side of bank lending (i.e. loan receivers), bank lending standards – the lending terms and conditions specified in a loan contract – provide a core piece of information on the factors affecting loan granting in a country.[1]

Just to highlight the importance of bank lending standards van der Veer and Hoeberichts (2016) find that, in the Netherlands, a one-point tightening reduces a bank's quarterly growth rate of business lending by about half a percentage point until bank lending standards are eased. This level effect of bank lending standards helps to explain low bank lending growth after a period of prolonged tightening as well as high bank lending growth in a period of prolonged easing, also providing another potential indicator for macroprudential policy. Pintaric (2016), reaches qualitatively similar conclusions for the case of Croatia. Similarly, Bassett et al., (2014) find that tightening shocks to this credit supply indicator lead to a substantial decline in output and the capacity of businesses and households to borrow from banks, as well as to a widening of credit spreads and an easing of monetary policy. Cappiello et al., (2010) use a panel of euro area countries to further empirically confirm this relationship.

Still, the area is vastly under-researched, with most papers, other than the above, focusing on how interest rates and lending standards are connected. One of the first papers on the topic is Maddaloni et al. (2009) who use the comprehensive Bank Lending Survey for Euro Area countries in a panel setup and aim to identify the impact of monetary policy on banks' appetite

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[1] Through the course of this paper, the terms "lending standards" and "credit standards" are used interchangeably.

for risk. Overall, their results suggest that lower overnight rates soften bank lending standards. This softening is true for all types of loans, but the impact is bigger for loans to nonfinancial corporations. On a similar note Maddaloni and Peydró (2011), confirm that lower interest rates can reduce lending standards, using US and Euro Area data. Similarly, other studies which take lending standards into consideration, focus on this risk-taking channel of monetary policy (inter alia, Jiménez et al., 2014; Ioannidou et al., 2014; Ciccarelli et al., 2015; Bonfim and Soares, 2018) and have reach the conclusion that bank lending standards are weakened when interest rates are lower.

With regards to finding other macroeconomic determinants of bank lending standards, very little effort has been devoted to thus far. Other than the risk taking channel of monetary policy (which does not appear to hold in the long-run as Michail et al. (2016) demonstrate), there has been very little effort to identify the determinants of bank lending standards. Of the few existing studies which have tackled this issue, Kara et al., (2016) find that securitization only has a small impact on lending standards. The results of Maddaloni et al. (2009) and Maddaloni and Peydró (2011) suggest that lending conditions are countercyclical, i.e. that higher real GDP growth tends to soften lending standards, while these are tightened in downturns. An early summary of the studies dealing with the determinants of bank lending standards can be found in ECB (2009).

The above suggest an overall scarcity of studies regarding the determinants of lending standards. Even more so, at the moment, there exists no explicit study which elaborates on how lending standards affect other macroeconomic factors in Cyprus. To assess both these topics, this paper employs a vector autoregression methodology using data from 2008q1 to 2019q1 aiming to find how lending standards and demand for loans affect and are affected by the macroeconomic.

The results suggest that only house prices appear to affect lending standards, with a positive house price shock causing a tightening. Other macroeconomic variables do not appear to have an impact on lending standards. House prices have the opposite impact on demand for loans, with an increase in the former having a positive effect on demand, while demand is inversely affected by the lending rate. However, lending standards have a strong impact on the economy, as they register an effect on lending rates and loan growth, and subsequently on GDP. This result, in line with the previous findings of the literature (Cleanthous et al., 2019; Michail and Thucydides, 2018), highlights the importance of credit availability in the economy. As credit conditions tighten, the pool of borrowers that are able to get a loan decreases, resulting in them withdrawing from loan applications.

To provide more insights to these conclusions, the following section offers an overview of the methodology and data employed in this paper. Section 3 offers an overview of the results from the estimation and discussed them, while section 4 concludes.

## 2. Methodology and Data

Bank lending standards are stationary, as they arise from the measurement of positive and negative responses from the banks, signifying either a tightening or a loosening of standards. As such, there is no justification in employing a cointegration setup a la Johansen and Juselius (1990). Thus, given that the analysis is interested in not only explaining the determinants of lending standards in Cyprus but also in observing the feedback loops between standards and

the economy, we proceed with the estimation of a Vector Autoregression (VAR) in growth rates. In particular, the setup employed can be expressed such that:

$$Y_t = C + \sum_{j=1}^{J} AY_{t-j} + \varepsilon_t \quad (1)$$

where $Y_t$ is a matrix of all the variables employed in the estimation. In particular, we employ lending standards and demand for loans from the Bank Lending Survey, as published on the Central Bank of Cyprus (CBC) website (see Appendix for details). To account for changes in monetary policy, we also employ the bank lending rate from the Monetary and Financial Statistics (MFS) publication (Table 10).[2] On the macroeconomic side, we employ real GDP in year-on-year growth rates and the core inflation rate, both obtained from Cystat. The rationale behind the use of core and not headline inflation is that the latter is also heavily influenced from oil price developments, which is not something that is expected to matter for the banking sector; on the other hand, domestic inflation developments are expected to have an effect on lending standard developments. These variables have been also been used by the previous literature (Maddaloni et al., 2009; Ciccarelli et al., 2015).

In addition to these, we also include the Residential Property Price Index (RPPI), as well as the amount of new loan transactions during the quarter. Both variables were obtained from the Central Bank of Cyprus website, with the latter obtained from the MFS publication (Table 4 – Domestic Residence). The rationale behind the use of loan transactions instead of the stock of loans lies in the peculiarities of the lending series: growth in the stock of loans may simply be the outcome of interest capitalization while actual lending has not increased. Furthermore, the fact that banks in Cyprus have engaged in loan sales, as well as loan write-offs has an obvious impact on the stock of loans, i.e. it would result in showing a decline instead of an increase in lending. As such, using transaction data, which show the precise amount which is attributed to actual changes in lending, (be it positive or negative), should result in more accurate results.

In theory, it expected that monetary policy and inflation should have a positive effect on lending standards while GDP is expected to post a negative sign. It should be remembered that a positive number with the reporting of lending standards suggests a tightening. The rationale behind the two expected effects is straightforward: higher interest rates should, ceteris paribus, mean that riskier investments will have to be undertaken, due to the higher return required for a potential project as the cost of lending has increased.

As these investments are riskier, it is expected that banks should not be as willing to grant a loan as they have been before. Similarly, an increase in inflation should suggest that the real rate of return declines, all else equal, making returns lower and thus decreasing the banks' willingness to lend. On the other hand, an increase in economic growth should suggest that there is a higher probability of projects registering positive cash flows and hence the overall riskiness of any loan is decreased. Similarly, a positive change in lending should, if banks are risk-averse, suggest that lending standards should tighten given that the pool of available lenders decreases.

[2] In our estimation, we have also included bond yields (source: Thompson Reuters Eikon), and the 3-month Euribor rate (source: ECB SDW) as proxies for monetary policy. However, the high correlation between lending rates, bond yields, and the 3-month Euribor (higher than 0.8), does not allow for using all three of them in the same estimation.

The remaining three variables, the real estate price index and demand for lending can be justified in having either sign. For example, rising real estate prices could provide both the rationale for less collateral risk and the rationale for increased risk if a bubble is formed. Similarly, increased demand for loans could indicate either that the economy is booming with borrowers seeking to obtain more lending, or that borrowers are looking to obtain more risky loans, perhaps even for the same reason. Taking account of data limitations with regards to the main variables of study (demand for loans and lending standards), the sample range dates from 2008q1 to 2019q1. An overview of the results from the estimation can be found in the following section.

## 3. What affects lending standards?

Figure 1 presents the impulse responses from the VAR estimation using the 7 variables described above. Given that presenting the total of 49 impulse responses would be cumbersome, we offer a selection of the responses, in order not to overburden the reader. As should be remembered, impulse responses reflect the response of a variable to a one standard deviation shock.

As the results suggest, a one point increase in RPPI causes a tightening in lending standards by 1.2 points. As expected, if house prices increase, demand for loans, both from individuals as well as from real estate developers and construction companies, goes up as the first need more funds to purchase and the second want more liquidity to boost production. As a result, demand for loans increases but, at the same time, less borrowers are able to meet the income criteria set by the regulators, resulting in a smaller pool of appropriate applicants. As a result, to counter this phenomenon, banks tighten the terms and conditions in their loan contracts.

On the other hand, lending standards do not react to changes in the lending rate as the response does not appear to be statistically significant. Similarly, domestic core inflation does not appear to have any statistically significant effect on lending standards. Lending standards also do not appear to respond to changes in GDP and it appears that they also remain insensitive to increases in demand for loans, as the response is again not statistically significant. In the same manner, lending standards do not appear to be affected by changes in the loans. Consequently, it appears that lending standards are not affected by the major macroeconomic variables, other than the real estate index.

With regards to demand for loans, it appears that an increase in the lending rate causes a decrease in the demand for loans. The rationale for this behaviour is straightforward: as the lending rate goes up, borrowing money from banks becomes more expensive which makes less people able to get loans from banks. As a result, the demand for loans decreases. In a similar manner, a one point increase in RPPI will cause an about 2.5 decrease in demand for loans. When house price index rises, houses become more expensive, so people are not easily able and are less willing to buy a house. As a result, demand for loans decreases.

Furthermore, a tightening in lending standards by one point causes a decrease in demand for loans in the short run. Tighter lending conditions in loan contracts reduces the available pool of loan applicants which fit the criteria for obtaining a loan from banks, forcing demand for loans to decrease as borrowers do not find it useful to apply if they feel that their application will be rejected from the bank.

FIGURE 1
*Impulse Responses*

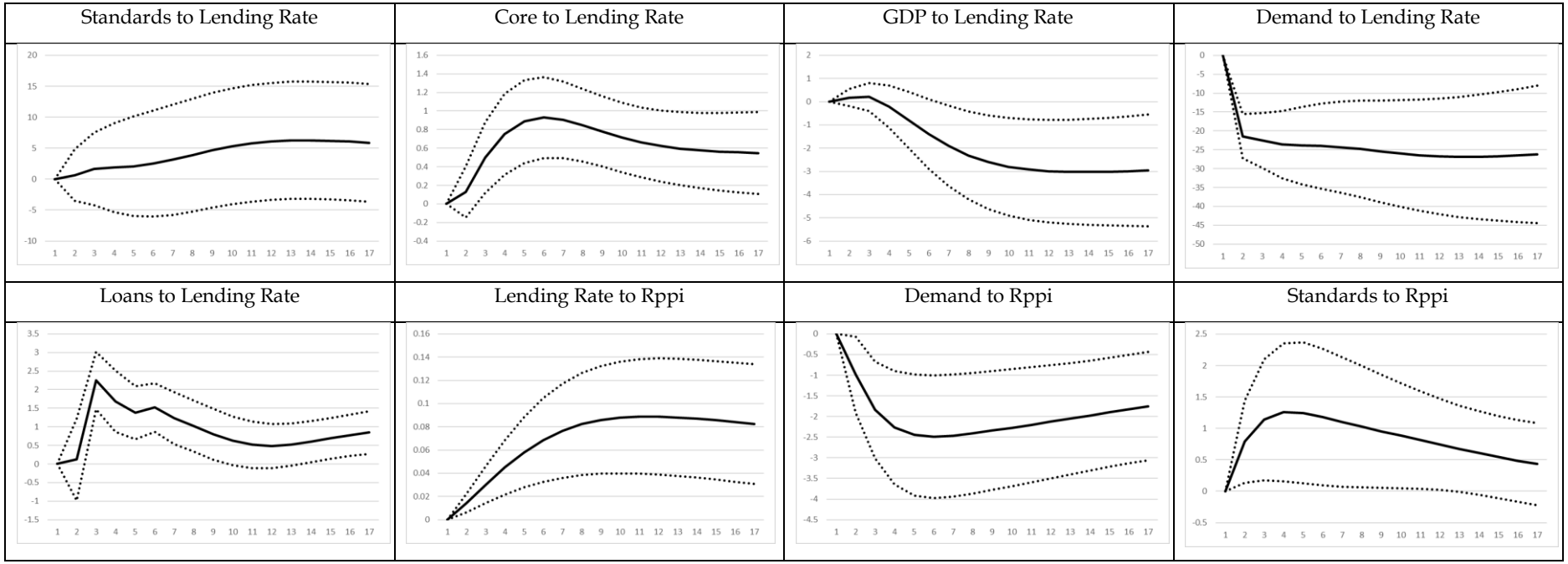


FIGURE 1
*Impulse Responses*

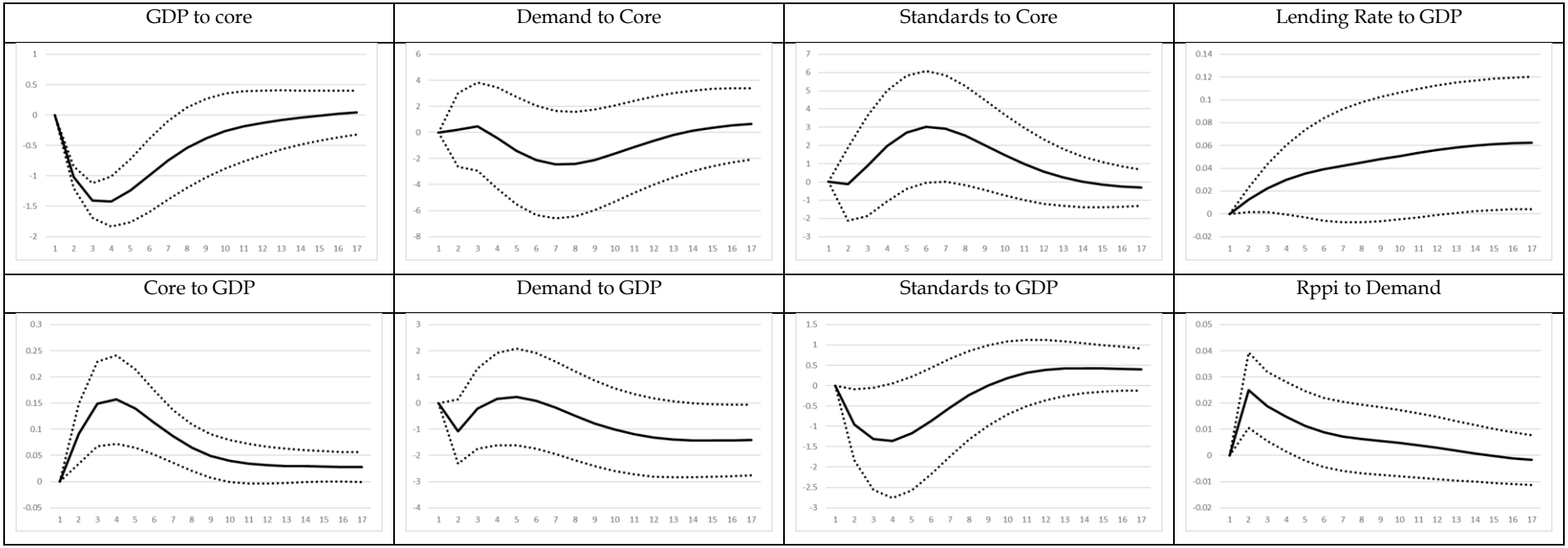
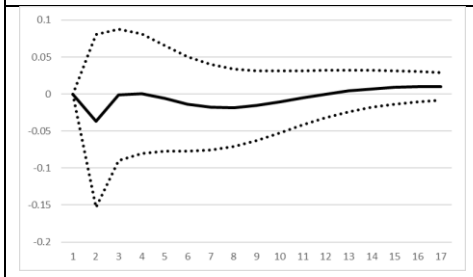
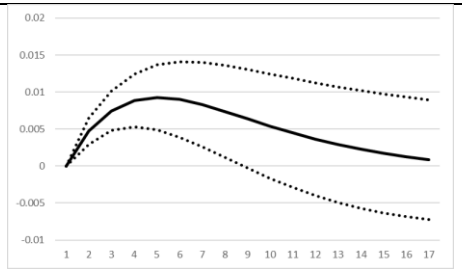
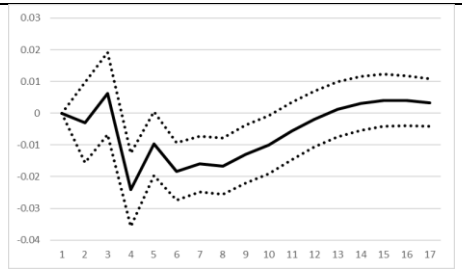
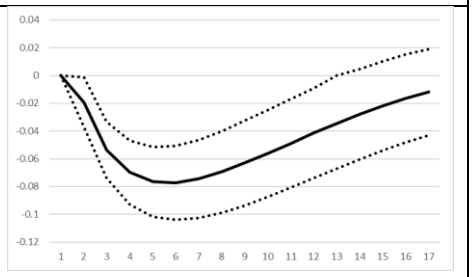
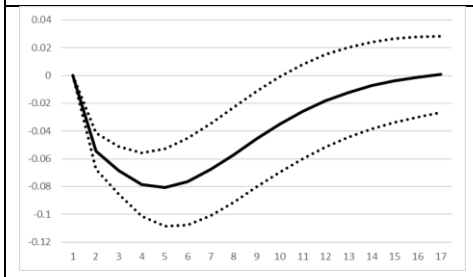
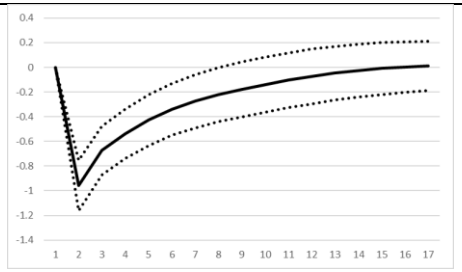
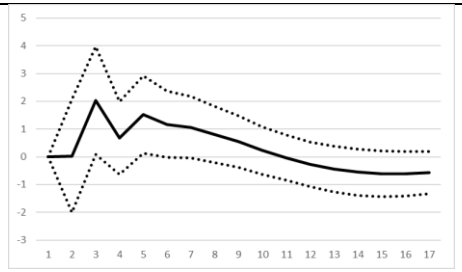
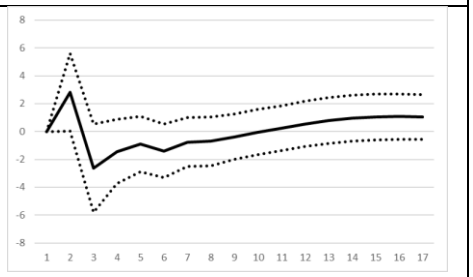


FIGURE 1
*Impulse Responses*

| Standards to Demand | Lending Rate to Standards | Loans to Standards | Rppi to Standards |
|---|---|---|---|
|  |  |  |  |
| **GDP to standards** | **Demand to Standards** | **Standards to Loans** | **Demand to Loans** |
|  |  |  |  |

On the other hand, demand for loans does not react to a change in core inflation, as it appears to be statistically insignificant. Similarly, there isn't a change in GDP when demand for loans increases, as it also is statistically insignificant, while the response of demand to a shock in loans also appears to not be statistically significant.

A rise in lending rate causes an increase in core inflation. This happens because, when lending rate increases, money borrowing for businesses becomes more expensive. Therefore, to counter the higher cost, businesses push their prices up which results in an increase in inflation. Additionally, an increase in RPPI seems to cause a rise of the lending rate: when house prices rise, the amount of lending required to purchase a house increases, hence demand for lending also rises, as also previously suggested. This increase in demand results in increasing the price of lending, i.e. the rate of interest. An additional justification could be that higher house prices reduce the amount of eligible borrowers and thus results in riskier lending. This would result in higher lending rates in order to compensate for the additional risk assumed.

On the opposite end, a one-point tightening in Lending standards causes about a 0.009 decrease in lending rate. The rationale would follow the same pattern as with higher demand, only in reverse. When conditions in a loan contract tighten, less people meet the criteria that are required to get a loan and to solve this issue, banks push lending rates down in order to accommodate for this decrease in the amount of risk they assume. Additionally, lower demand for lending after a tightening in standards would also mean that the price of lending, i.e. the interest rate, would have to drop.

The lending rate does not appear to be affected by GDP, as the response is not statistically significant. On the other hand, loans appear to be influenced by lending rates as a shock in the latter has a small positive effect on the former.

With regards to the relationship between the macroeconomic variables, which can be seen as an exercise in the plausibility of the model results, a rise in core inflation is found to cause a short run decline in GDP. This is an expected reaction, given that an exogenous, unexpected increase in inflation means that prices in the economy rise and thus people are not able to buy as much goods and services as they used to. This leads to a decrease in consumption which causes a fall in GDP. The relationship between prices and output is explored via another path, given that a one-point rise in GDP causes a rise in core inflation. Thus, an unexpected, exogenous, increase in domestic demand would mean higher consumption spending which would lead to an increase in prices and hence the inflation rate.

With regards to house prices, a positive shock in demand for loans suggests that RPPI would also face appreciating pressures in the short run. In addition, a one point tightening in Lending standards would, as expected, decrease Rppi by 0.08% in the short run. The reason is that, when the terms and conditions in loan contracts tighten, less people can get a loan from banks as they don't meet the criteria mentioned in the contract anymore. Therefore, fewer people borrow money from banks which leads to less people buying a house. Consequently, the demand for houses decreases and the price goes down in order to attract more people to buy a house.

Finally, just to point out that lending standards have an important effect on the economy, impulse responses suggest that when lending standards tighten by 1 point, GDP drops by approximately 0.08%. This result, in line with the previous findings of the literature, highlights the importance of credit availability in the economy. As credit conditions tighten, the pool of borrowers that are able to get a loan decreases, resulting in them withdrawing

from loan applications. As a result, tighter lending standards result in lower demand and lower investment spending leading to an overall drop in overall GDP.

To sum up the results of this section, we would first like to note that lending standards do not appear to be influenced by the major macroeconomic factors, such as inflation and GDP. The only variable to which they respond is the house price index, a reaction suggestive the close relationship between the two in Cyprus's recent history. Demand for loans and most of the other variables are however affected by changes in lending standards, showcasing the importance of credit availability in the economy. This result, in line with the previous findings of the literature in Cyprus (Cleanthous et al., 2019; Michail and Thucydides, 2018), suggests that as credit conditions tighten, the pool of borrowers that are able to get a loan decreases, resulting in them withdrawing from loan applications. This is further underlined by the fact that real GDP responds significantly and negatively to a credit standard tightening.

As a conclusion, the results have pointed out three important policy conclusions: first, lending standards are likely to be more related to bank-specific variables, such as capital ratios, non-performing loans, and liquidity, than macroeconomic variables. Even housing prices, which appear to have an impact, may be more related to loan-to-value ratios, and other valuations instead of having a direct impact. This point is in accordance with Zhang and Tressel (2017), who suggest that instruments targeting the cost of bank capital most effective in slowing down mortgage credit growth, given that these would affect the banks' incentives to give out funds. Second, demand for loans is affected by lending standards, suggesting that once the supply side of lending is hurt, demand drops significantly. Third, lending standards have a significant impact on the overall level of lending, as also suggested by the first and second points, which in its turn has a significant effect on real GDP. Naturally, a question which remains unanswered is which specific bank-related factors affect lending standards, however, we leave this, admittedly important topic, open for future research.

## 4. Conclusions

This paper has provided an overview of how lending standards affect and are affected by the underlying macroeconomic conditions in the Cyprus economy. Even though the data range does not allow us to use a full business cycle, the results are indicative of their importance: lending standards have a strong impact on the economy, as they register a significant effect on lending rates and loan growth, as well as demand for loans. The combination of the above appears to have a significant effect on GDP. On the other hand, lending standards do not appear to be affected by any macroeconomic variables other than house prices. An increase in house prices appears to cause a tightening in lending standards, while the same shock has a positive effect on demand for loans. Overall, the results are supportive of the conclusions reached by previous studies of the Cypriot economy and highlight the importance of credit availability.

Further to the results, this paper is the first to utilize the Bank Lending Survey in Cyprus for research purposes. Future research could find the survey useful in other realms of economic analysis such as the effect of lending standards on bank interest rate spreads (credit risk) or bank liquidity (e.g. the loans-to-deposits ratio), the relationship between the quantitative easing and standards, as well as a more granular approach to lending standards, i.e. using a breakdown between businesses and households.

## Appendix – The Bank Lending Survey

The Bank Lending Survey is a qualitative survey of bank lending, aiming to assess credit conditions in the euro area (source: Central Bank of Cyprus). [3] The survey is conducted on a quarterly basis and aims to assist the European Central Bank in its evaluation of economic and monetary developments in the region. The survey supplements existing quantitative data on interest rates and bank credit, providing additional information on non-interest rate terms and conditions applied to loans and credit lines as well as on various factors affecting the demand for loans in the euro area.

The survey is addressed to senior loan officers in a representative sample of euro area banks and covers a broad range of topics relating to loans to enterprises and households. The revised, as from April 2015, questionnaire consists of 22 standard questions and is divided into two parts. The first part contains 9 questions on loans or credit lines to enterprises while the second part contains 13 questions on loans to households, split between (a) loans for house purchase and (b) consumer credit and other lending.

The questionnaire captures both actual and expected developments in credit markets, using 18 backward-looking (stated in terms of changes over the past three months), and 4 forward-looking questions (expectations of changes over the next three months).

For every question, the participating bank senior loan officers may choose among five possible answers. With respect to the questions on credit standards, the possible answers are: "tightened considerably", "tightened somewhat", "remained basically unchanged", "eased somewhat" and "eased considerably". With respect to questions on the demand for loans or credit lines, equivalent possible answers exist.

The ECB publishes the BLS results on a quarterly basis. The relevant publication includes the detailed results (the percentage of respondents selecting each possible answer), as well as a variety of summary statistics, such as the net percentage, the diffusion index, the mean and the standard deviation.

The main statistical tool used by the ECB for analysing the euro area aggregated results is the net percentage, which focuses on the difference between the share of banks reporting tightening of credit standards and the share of banks reporting easing. A positive net percentage indicates that the majority of banks has tightened credit standards ("net tightening"), whereas a negative net percentage indicates that the majority has eased credit standards ("net easing").

An alternative measure for the statistical analysis of the survey results is the diffusion index, which is very similar to the net percentage, but differs as to the method of estimation. The interpretation of the diffusion index follows the same logic as the interpretation of net percentage.

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