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Liquidity in the Banking Industry.
The Effects of ECB Intervention and Changes in Disclosure Regulation: an Accounting Perspective

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Introduction

The recent financial crisis has shown the relevance of liquidity in the banking industry. To ensure the stability of the financial system the regulator has increased liquidity constraints to the capital regulation. It has long been suggested that the existence of capital adequacy regulation plays, including the liquidity requirement, an essential role in helping financial firms to avoid bankruptcies and their negative externalities on the financial system (Dewatripont and Tirole, 1994).

Credit institutions across EU face an unprecedented amount of regulatory reforms. In detail, during the debate related to the Basel Capital frameworks some critics argue how stringent requirements can impact negatively the banking system in recessions with the consequent cut of lending activity (Peura and Jokivuolle, 2004). Specifically, in relation to liquidity, Basel 3 framework requires financial institutions to hold more liquid assets and issue more long-term debt. Banks are required to hold at all times liquid assets, the total value of which equals, or is greater than, the net liquidity outflows which might be experienced under stressed conditions over a short period of time (30 calendar days). Liquidity is represented as an equilibrium between loans and deposits and it decreases every time a bank sells loans to corporate and individual customers.

The provision of liquidity for banks assumes challenging connotations from different points of view. Raising new capital becomes hard every time that markets are illiquid as well as liquidity has a fundamental influence on the same systemic risk of the entire banking system (Bushman, 2014). Consequently bankers are not indifferent to combine capital and liquidity according to the risk management decisions that have important immediate implications for the bank's access to funding

(Calomiris et al., 2015). Furthermore, the same definition of liquid assets affects the behaviour of market participants, specifically the liquidity of different asset classes.

This thesis considers liquidity issue in banks from two concurrent perspectives: the market reactions to a liquidity shock, such as the announcements of the Quantitative Easing (QE) in the Euro zone among the years 2015-2016 and the market reactions to the mandatory disclosure of foreign cash held by European banks thanks to the new regulation of the "Country-by-Country-Reporting" (CBCR) in 2014.

The first study examines the capital markets' assessments to the key events related to the QE adopted for the first time in the Euro zone. QE programme intends to provide new liquidity for European banks thanks to the intervention of the European Central Bank (ECB). The second study analyses investors' reactions to the new key business information, particularly the mandatory disclosure related to the amount of foreign cash held by the European banks in their subsidiaries situated in countries different from the main residence country.

Figure 1: Outlook of the Research Project

In detail, the first paper investigates on the stock market reactions to the announcements of the QE programme starting from January 2015 and following explains which, how and why bank characteristics might influence the investors' reactions. Existing literature documents the different experiences of QE in other countries and in other time periods (Fawley and Neely, 2013), mainly in US and in UK after the boom of the last biggest financial crisis (2007-2008) and in Japan during the years 2001-2009. There is still an ongoing debate related to the beneficial effects of the Quantitative

Easing policy. Even though central banks attempted in all cases to inject new liquidity to allow an economic recovery, it is also true that they didn't always obtain those results as they expected. Our identification strategy consists in investigating on investors' expectations taking into account that new liquidity injection might assume different connotations into the respect of banks' characteristics. In this way, we identify the bank prior conditions at bank-level as instrument to explain and to understand the future economic consequences of an unconventional programme as the QE. While the extant literature points out the effects of the QE in other countries highlighting empirically the economic insights about QE consequences, this study attempts to provide different considerations about the financial and economic conditions of the European banking sector before the adoption of QE in the Euro zone.

The sample covers listed banks, such as commercial and investment banks, of the Euro zone countries, other countries of the EU as Sweden, Denmark and UK and finally banks of countries with a relevant presence in the Economic European Area (EEA), such as Norway and Switzerland. We adopt an event study approach among the key events leading to the adoption of QE programme and further we conduct the analyses at firm-level including as bank characteristics the capital adequacy, the asset quality and the risk exposure ratios of the European banks. These bank features represent the main drivers through which today investors conduct their valuations and capital allocation's choices among the banking sector. The first findings report a negative overall market reaction among the six QE announcements and a positive association between the cumulative abnormal returns and specific bank characteristics such as liquidity ratio and leverage, while a negative association with RWA. Investors' assessments are based on the valuation that banks will increase their liquidity and consequently banks will address this new liquidity to increase theirs assets (positive increase of assets growth) as well as their leverage and their capitalization. From these analyses it seems that banks not well capitalized might not get future benefits also according to their financial robustness and specifically in terms of regulatory capital. The main economic insights from the analyses conducted at bank-level are that investors might see new opportunity for banks to increase their risk-exposure given the new liquidity injection by ECB. Our contribution lies on to highlight how the relation between bank-specific characteristics and the stock market reactions becomes a sort of barometer for

next future considerations about the effects in terms of improvement of the banks' soundness and financial stability.

The second paper considers the new mandatory disclosure about the foreign cash held by European banks in their foreign subsidiaries. According to transparency policy dictated by the European Directive CRD IV "*Access to the activity of credit institutions and the prudential supervision of credit institutions and investment firms*" (2013), European banks disclose for the first time in 2014 new key business information, particularly the amount of foreign cash per country, in a document called "Country-by-Country Reporting" (CbCR). This report lists not only the amount of foreign cash holding in countries different from the main residence country, but also further information, such as the amount of tax paid in each country, the income before tax, the number of employees for all the bank's foreign subsidiaries, the description of activity of the foreign subsidiaries and the amount of governmental subsidies. The CbCR mandatory disclosure opens a new room on which to investigate and particularly how capital markets value the bank liquidity when it is held in a country different from the main residence country. Specifically, the presence of tax advantages in countries different from most part of EU countries might arise new economic considerations by investors among the European banking sector. Because liquidity, including the foreign cash holding, is a source to respond to several banks' needs, it might assume different connotations according to agency costs and repatriation costs as proposed by the prior accounting studies.

After hand-collecting the data on the base of the new reports that all the European financial institutions are required to realize, the obtained sample includes 62 European financial institutions disclosing CBCR, while 121 not disclosing. Through a short-window event study to the announcements of the date of annual report publication, when it includes CBCR, and of the date of CBCR publication, when it is not included in the annual report, the main results show a positive market reaction on total cash when banks announce CBCR as well as a positive association between the cumulative abnormal returns and the foreign cash holding. When we split foreign cash held or not in countries classified as "tax haven", findings show that investors don't perceive positively the foreign cash held in countries with taxation advantages. Based on the prior literature (Dyreng and

Lindsey, 2009; Hanlon and Heitzman, 2010; Dyreng et al., 2016) showing empirical evidences about the foreign cash holding and tax considerations as well as foreign cash holding and opacity in information environment, this study attempts to add new contributions. The mandatory disclosure given the CbCR is a further step for increasing transparency in the European banking sector particularly positively expected by the principal players of the capital markets as investors. Furthermore my efforts are addressed to investigate how investors value cash when it is held in tax havens. Foreign cash in tax havens implies negative valuation among the European banking sector, because of the presence of high tax repatriation costs and the probability to be just a benefit for bankers to hide further operations in the capital markets.

Overall the doctoral thesis considers two important aspects of bank liquidity relevant in the context of the significant headwinds faced by the banking sector and the European economy in recent years. The thesis focuses on two shocks both of considerable importance in terms of future banking regulation, economic growth and accounting policy and it attempts to provide new insights related to the banking liquidity issue, which presents still room to investigate on.

Chapter 1

Investors' Reactions to Liquidity Injection: An Investigation of ECB's QE Programme on Banks' Valuation

1.1 Introduction

We examine the stock market reactions to the key events leading to the adoption of Quantitative Easing (QE)[1] programme in the Euro zone among the years 2015-2016 and we identify which, how and why bank characteristics might influence the capital markets' reactions following macroeconomic systemic policies. Prior experiences taught us that QE represents the main response to the deepest economic and financial crisis never experienced in a specific geographical area (Fawley and Neely, 2013; Fratzscher et al., 2016) attempting to restructure the companies' economic conditions and to restore investors' confidence in the financial markets (Joyce et al., 2012). Specifically, the Euro QE intervention consists in the purchase of longer-term securities by the European Central Bank (ECB) aimed at overcoming the liquidity freeze suffered by EU banks. ECB buys every month a significant amount (€ 60-80 billion) of assets meeting stringent requirements related to the maturity and the rating in exchange of new liquidity. There is still a debate on the merits of the expectations to adopt this unconventional monetary policy, because the new liquidity issued by a central bank might be perceived as the last resort of the banking sector as well as it might announce a future new speculation opportunity for highly risky market bubbles (Acharya and Ryan, 2016).

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[1] https://www.ecb.europa.eu/press/pr/date/2015/html/pr150122_1.en.html

Our objective in this paper is to provide empirical evidences concerning the market's expectations about the intentions by ECB on the effects of the QE programme. Specifically the goal of our study is to identify the prior conditions at firm-level of the banking sector, as the barometer for future considerations about the effects of QE programme in the Euro zone, such as how and why new liquidity might allow the recovery of the European economic growth through the banking lending channel. The study focuses on the European banking sector because it is explicitly involved to the QE's main provisions that aim to enhance the economic recovery. Market reactions studies present specific challenging issues. Knowing that this programme will affect the banking system of a specific area, the Euro zone, we identify a control group of banks which the headquarter is situated in other countries not affected by QE. Further we control the presence for other confounding events occurring during the announcements by ECB.

We attempt to address these issues in two ways. Indeed we employ European listed banks as treated group and at the same time we identify listed banks of other countries, such as US, China, India, South Korea, Japan and Australia as control group. In this way we verify whether the magnitude of the treated group differs from that one of the control group. Furthermore we verify that the QE announcements by ECB have not been disclosed by the press in the prior times.

Exploring how investors react to the more unexpected announcements of QE programme and whether returns are driven by bank-specific attributes, we concentrate our efforts on two type of analyses. As the first step, we try to ascertain whether stockholders of EU banks react to the QE programme. We identify the events corresponding to the QE announcements (six event-windows) in the years 2015-2016 through the ECB web site reporting all the details of each announcement by the President Mario Draghi. At this stage our expectations are those to find a more significant reactions among banks stock prices in the EU affected by the QE comparing the returns with a non-treated group of banks outside of the EU area. Next we examine whether the magnitude of investors' reactions are driven by bank-specific features, with a narrow focused on the features of risk and lending behaviours. Because liquidity externalities can drive to different results according to the firm's financial constraints and financial structure (Shleifer and Vishny, 1992; Kiyotaki and Moore, 1997; Zingales, 2009), we test whether banks' pre-QE financial conditions (e.g. risk-exposure;

capital adequacy and asset quality) affect investors' assessments of the potential benefits of QE in terms of new liquidity (Bowen and Khan, 2014; Plantin et al., 2008; Dontoh et al., 2012; Elsinger et al., 2006).

Bank characteristics assume a particular relevance according to the analyses we intend to conduct. Investors are aware that banks' specific features have important economic consequences for the stability of a bank and in presence of a new liquidity injection they might induce different economic insights. The new liquidity injection thanks to ECB intervention responds first to the need to attract again investors in a specific area (Euro zone) affected by the prior heavy credit crunch and second to the need for banks to support the real economic growth. We have to take into account that liquidity in banks has acquired more relevance following the last financial crisis. The regulator realized that even though banks were aligned to regulatory capital ratio, they could incur the probability to fail because of a low level of liquid assets. In other words the requirement of regulatory capital has not been sufficient to absorb the impact of a financial turbulence including the conservative capital buffer and even the second additional capital buffer. Consequently the regulator has provided higher ratios not just for the regulatory capital, but also for the liquidity to guarantee the soundness and financial stability of a bank (EBA, *New Bank Liquidity Rules: Dangers Ahead*)[2]. The asset quality is mainly based to verify the exposure of credit losses according to the level of reserves addressed for the impaired loans. Through the transparency exercises and the stress tests conducted by the European Banking Authority (EBA), such as the banking supervisor role played by ECB, investors know more into the details how far banks are from the regulatory thresholds according to their business development (Bischof and Daske, 2013). Basically the asset quality of bank's balance sheets reflects the underlying capital management choices.

While banks' asset quality has been considered in terms of credit losses and risks-exposure for the high proportion of banks' loans among the total assets (Nissim, 2003), it has long been suggested that the existence of capital adequacy regulation allows to avoid bankruptcies as well as other financial diseases (Dewatripont and Tirole, 1994). The decision to increase the regulatory capital

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[2] https://www.eba.europa.eu/documents/10180/807776/20121002_BSG_Liquidity_Paper_incl_amendment.pdf

ratio tends to amplify the natural procyclicality forcing banks to cut back lending activity in recessions (Peura and Jokivuolle, 2004) as well as higher capital standards reduce banks' ability to create liquidity (Diamond and Rajan, 2000). The divergence between capital and liquidity requirements lies also on the objective factors that while capital is not observable at all times and depends on risky assets, liquid assets, specially cash, are always observable and reduce strongly the default probability risk (Calomiris et al., 2012).

QE programme intends to provide new liquidity, such as cash, for banks purchasing long-term assets (governmental bonds) from their portfolios. Given the empirical evidences from prior contribution related to the QE efficiency, some important concerns arise on the expectations to attract again the investors' confidence in the Euro area and specifically on the role of the banking industry to support an economic recovery. The findings show mainly a strong negative market reaction among the announcements of QE intervention. Even though investors don't show any trust in the markets they forecast future potential benefits to the banks' financial statements in terms of relief from assets and a boost in potential liquidity. Therefore banks might not address the new liquidity to robust their financial structure and might tend to increase their risk exposure.

A key empirical design challenge of investigating the capital markets' expectations about the potential of the QE programme to cut off the financial diseases among the European banking sector is to identify which banks are more beneficial or not than others. On one hand it is plausible that larger and stronger banks are associated with higher capital ratios, therefore more likely to be ready to support again the economic growth. On the other hand, it is also desirable that weaker banks, the not well-capitalized, are associated with lower capital ratios and worst asset quality, therefore more likely to benefit of new liquidity to assess their capital management. Following, if capital markets believe that the new liquid provisions have the potential to allow stronger banks to be more reactive for the lending activity, we would expect to find a better response from the markets. This expectation confirms the empirical findings where the liquidity externalities' benefits are based on the firm's economic conditions and firm's financial structure (Zingales, 2009). Focusing again on the developed analyses our empirical evidences are aligned to the conceptual framework following which every time that a central bank's intervention has the goal to support the investment recovery,

the bank lending channel plays a crucial role and it responds to the expectations of the markets if the same banking financial and economic structure is enough stable (in terms of regulatory ratios).

This paper intends to add new contributions. First, our study investigates the capital markets' assessments on the expectations among the European banking sector given the key events of the QE programme. It differs from earlier studies that consider QE experiences together with banking liquidity, because it shows which, how and why banks' features (capital adequacy, asset quality and risk exposure ratios) can influence the investors' valuation in presence of an expansionary macroeconomic policy. We add new economic insights related to the prior conditions at bank level suggesting that capital markets are not faithful of the effectiveness of an unconventional policy as represented by the Quantitative Easing. Second, we add to the large literature on banking regulation by examining the impact of the QE announcements. The banking industry has undergone a process of incremental regulation increasing the existing ratios and providing new ratios more addicted to the financial stability of a bank, such as the liquid and the funding sides. Finally, the study is associated with the ongoing debate of the trade-off of a stricter banking regulation, as response to a financial crisis featured by a discretionary adoption of rules in timing and functions (Curtin, 2007), and the intervention role of a central bank to alleviate the heavy consequences of a credit crunch (Kashyap and Stein, 1997; Dontoh et al., 2012).

Our findings and contributions are subject to the following caveats. First, similar to the most part of event studies, we assume the hypothesis of markets' efficiency, where the market adjusts rapidly to new information (Fama et al., 1969). The results are also subject to the extent to which the control group of banks can mitigate concerns over confounding events. Second, even though each ECB announcement related to QE programme is full detailed, ECB has decided to not disclose completely those information about the timing and the amount of bonds extrapolated from the specific banks' portfolios. Further, because of the uncertainty about the QE duration, it is expected that QE programme might be undermined by subsequent implementations and enforcements and even reductions of the same purchases. Third, because the results provide an estimate of the investors' assessments regarding the few trust on European banks given the QE programme, it is also evident that the range of time period about banks' accounting data are restricted to a short period of two years

(2014-2015) and it might represent not a comprehensive evaluation of these outcomes.

In sum this study assumes interesting connotations about how investors perceive the importance of banks' health into the respect of a macroeconomic shock and how the accounting information is again the main driver for the valuation of banking financial stability.

In the next sections: 1) we present the prior contributions related to QE experiences and the role of liquidity in banks from both accounting and financial perspectives including the research hypotheses and relative predicted signals on the impact of QE in the Euro zone; 2) we describe data sources and the sample; 3) we illustrate the methodology adopted for the event study and the model to test the predictions at firm-level; 4) we give evidence of the empirical results; 5) and finally we conclude highlighting the implications and the contribution of the study.

1.2 Background and Hypotheses Development

1.2.1 Prior QE Experiences and the Role of Liquidity in The Banking Sector

Prior studies related to the QE experiences present empirical contributions to measure the impact of central bank asset purchases on financial markets as well as the wider economic effects of monetary policy interventions. In response to the sharp deterioration of the credit crunch hitting the banking sector, the Quantitative Easing programme appears to be the solution as recovery plan for the economy in different countries.

Identifying among prior studies the QE experienced in more than one geographical area, we find a particular contribution by Joyce and Spaltro (2014) related to the Bank of England unconventional policy during the years 2009-10 as response to the deterioration of the last biggest financial crisis. They highlight the relationship between bank lending growth and its determinants exploring whether the relationship between deposits and bank lending changed during the crisis. Furthermore they investigate on the heterogeneity of bank's asset side at individual level and they find that small banks are more responsive than large banks to lend according the level of their deposits. A specific study conducted by Bowman et al (2012) witnesses the QE experience in Japan during the years 2001-2009 with some evidences at firm-level. In this case both academic researchers and financial analysts agree that QE was not very successful to achieve the goal of stimulating aggregate demand to avoid

deflation, but the efforts produced an increase of reserves and liquidity for Japanese banks. Indeed their findings show a positive and significant relationship between banks' liquidity positions and lending growth suggesting that the expanded reserves boosted the flow of credit to the economy. Other evidences related to the Euro zone area emphasize the crucial role of liquidity issued by ECB in presence of financial tensions caused by country factors as well as by new banking regulation interventions (Fiordelisi et al., 2014; Ricci, 2015). Before announcing the QE, ECB adopted several unconventional programs with the main goal to support the real economy of the Euro zone particularly affected by the last sovereign debt crisis (May 2010, Greece). ECB with the beginning of the sovereign debt crisis in the Euro area has adopted more than one non-standard program with the aim to contain the financial diseases and to support the funding conditions for banks. ECB has in this way activated a relevant period of particular dependency on its liquidity for all those banks under its supervision and affected by the same sovereign debt crisis. The results of these macroeconomic experiences on the Euro area have been to create among the banking industry the expectation of central bank to become the lender of last resort by providing liquidity against pledged problem assets as suggested by Acharya and Ryan (2016). Also TARP initiative in US in the years following the financial crisis was based on providing new liquidity for the banking sector (Calomiris and Khan, 2015), differentiating large banks from small banks, where the first ones were strongly pressured to participate to the programme even though in presence of intentions addressed to support the whole American weak banking system.

Traditional and non-traditional interventions by a central bank are particularly considered in the prior literature in order to investigate market's reactions on the banking system and they become a barometer on the effectiveness of the same economic monetary policies (Ricci, 2015). Our study differs from prior literature insofar as it highlights that the expected boost in liquidity can generate concerns among investors given the state of health of the same banks (Brunnermeier 2009; Lev, 2013; Blankespoor et al., 2013; Calomiris et al., 2015).

Liquidity for banks represents one of the main sources to balance the relation between loans and deposits that reflects the level of health and the financial stability of a bank. Liquidity is strictly connected with capital ratios, whom objective is to limit default risk and to encourage good risk

management (Jokipii and Milne, 2011; Calomiris et al., 2012). The last financial crisis has taught us that regulatory capital is not totally exhaustive to attenuate financial diseases inducing heavy impacts not just for the banking system, but also in a more general economic scenario. Because regulatory capital together with the conservative capital buffer and the additional capital buffer represent the first pillar to avoid bankruptcies and other negative externalities on the financial system (Dewatripont and Tirole, 1994), after the financial crisis the regulator has identified for banks necessarily higher capital standards and a liquidity coverage ratio (LCR) to face future financial turbulences. Liquidity acquires a particular relevance also for the timing that banks should have available liquid assets, such as cash and all marketable securities that can be transformed in cash in 30 days of calendar.

Prior contributions document several aspects that we have to consider into the respect of our analyses' development. First, higher regulatory capital standards are costly because they reduce banks' fragility and consequently their ability to create liquidity (Diamond and Rajan, 2000). Second, the liquidity risk increases every time that short-term debt is invested for long-term assets. In this way a bank might be unable to roll over maturing debt and might fail despite being solvent according to the regulatory capital ratios (Ratnovski, 2013).

Although the fundamental importance of banks' liquidity in order to face potential future financial downturns, it needs to investigate more on the effects of pre-liquidity conditions of a bank given an unconventional central bank's intervention for providing new liquidity. The focus on the (accounting) determinants of market reaction is justified in light of the importance of risk and financial-based (ex-ante) measures for current and potential investors that are about to make their capital allocation choices and they reflect the economic sense that an intervention announcement by a central bank can assume among the same banking system in terms of financial stability. The accounting determinants related to the risk exposure literature, such as regulatory capital, liquidity, asset quality and solvency ratios, reflect generally the health of the banking system and at the same time become the main drivers of investors' valuation on each specific bank. The particular heterogeneity of banks' assets side and the opacity in information environment as unique feature of the banking industry induce researchers to still investigate (Bowen and Khan, 2014; Acharya and Ryan, 2016).

One of the main considerations according to the liquidity and prior banking regulation adopted in each European country is based on some empirical evidences about the existence of higher liquidity ratios for the same banking industry in particular countries. The pre-existing liquidity requirements following the own country regulation is considered in the study conducted by a group of researchers about the market's reactions to the announcement of new liquidity ratios by Basel Committee (Onali et al., 2016). The countries indicating higher liquidity ratios before the enforcement of Basel regulation are UK, Switzerland, Germany, Netherlands and Finland. Even though the presence of homogeneity in terms of regulation and supervision, it is still important to consider these country factors that can make the difference also at individual levels. In those few countries mentioned above there is also a particular presence of big banks supporting a specific systemic risk with important economic and financial consequences in case of financial turbulences.

1.2.2 Research Hypotheses

Macroeconomic policy interventions exert a significant effect on players and actors in the economic arena, especially in the banking industry (Fiordelisi et al, 2014). Such interventions differ from stand-alone regulation insofar as regulation is stable and predictable, therefore after the first-time introduction and adoption, all actors adjust their equilibria accordingly. On the contrary, macroeconomic interventions such as the ECB's QE programme represent an interesting shock that is unanticipated by most of the players (at least in the if, when and how much). QE has the objective to inject "new" liquidity through the purchase of the eligible assets[3] on the secondary market, which are for the most part governmental bonds held in European banks' portfolios. In essence, the QE sparks a substitution (future liquidity vs current liquidity) that should free up resources to the banking system to revamp credit and lending behaviours.

QE programme represents an opportunity to restore investors' confidence to believe in the economic growth of the Euro zone as partially suggested by prior experiences in other times and countries (Bowman et al., 2011; Joyce and Spaltro, 2014; Calomiris and Khan, 2015). It is also plausible that because liquidity externalities might produce good effects in the banking sector according to the

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[3] https://www.ecb.europa.eu/paym/coll/assets/html/index.en.html

banks' economic and financial structure, we would expect to find not a positive market response if we take into account the particular financial diseases of the European banks after the biggest financial crisis, the sovereign debt crisis and the consequent credit crunch.

Thus our first overall hypothesis matches the concerns about the effectiveness of ECB's goal to regain investors' trust thanks to the announcements of QE programme.

Hypothesis 1: The announcements of new liquidity injection by ECB through the key events leading to the adoption of QE programme have an overall positive (negative) stock price reaction among European banks.

Generally the announcements convey different communications about QE programme. We examine an overall event window for all event windows aggregate together and at the same time also each of the six event windows separately (see Appendix II – "Event Study Timeline"). Therefore we partition the sample events into three categories: 1) "*information announcements*" related to the process of purchases by ECB; 2) "*details' announcements*", through which ECB describes the rules and the requirements of the QE programme; 3) "*implementations' announcements*" following which ECB adds new elements related to its purchases of public sector assets, such as new financial instruments issued by supranational agencies (e.g. European Investment Bank)[4]. Focusing the attention on the announcements some concerns arise. Indeed ECB adds to the list of the eligible assets corporate bonds explicitly not held by European banks, as well as an increase of the amount for the monthly purchases and finally an increase of the same duration of the programme maintaining a proper level of market liquidity. Our expectations to each individual announcement by ECB are based on the few credibility to address adequately the new liquidity injected by ECB. The sixth announcement concerning the decision to continue QE programme until September 2017 might be for example not a good signal for the efficiency of the programme from investors' point of view.

Because our expectations are based on several concerns related to the effectiveness of the QE programme and to the weakness of the European financial system, it becomes crucial to verify what

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[4] https://www.ecb.europa.eu/mopo/implement/omt/html/pspp.en.html

affects the magnitude of the markets' assessments at bank-level. In particular we address the following questions: 1) whether investors might believe in a beneficiary economic impact for some banks instead of others and why; 2) in which sense and specifically how bank prior conditions become the barometer for investors' valuation among European banks. To these questions it is fundamental to start an examination of the cross-sectional relationship between the overall market reaction and the bank characteristics that indicate the stability and the soundness of a bank. We consider those banking features proposed in the prior literature that potentially contributed to banking risk-exposure considerations and to the assessment of the banks' financial vulnerability (Klomp and de Haan, 2012). Specifically we identify three bank regulatory categories, such as 1) the capital adequacy, including the regulatory capital and the liquidity ratios, 2) the asset quality and 4) the solvency ratio implying risk-exposure ratios.

We now turn to the investigation of the market's assessment on the extent to which the new liquidity provided for European banks following QE programme might be well perceived according to some considerations in terms of those firm characteristics identified for further analyses. The idea is that banks may be perceived more financially stable thanks to QE intervention, but investors may be worried about the new liquidity because it might represent an element to increase the own volatility or to take strategic choices of capital management by banks' side into the respect of ECB's goals. This has also been suggested by prior empirical evidences that more capitalized banks are less exposed to monetary policy changes (Madura and Schnusenberg, 2000). Furthermore taking into account the role of prudential regulation of the banking system, we note that it seeks to ensure the capacity from capital and liquidity perspectives to properly manage risks (Farag et al, 2013). Another crucial point is that prior QE experiences have highlighted the importance to consider the economic and financial structure of each bank (Shleifer and Vishny, 1992; Kiyotaki and Moore, 1997; Zingales, 2009), every time that banking sector become the first channel to transmit new liquidity for improving the market conditions of real economic growth. Bigger and stronger banks are, more they will be ready to provide support through the lending activity. The main risk is that weaker and financially unstable banks might be in trouble to respond to the Central Bank's expectations and investors might see opportunistic choices according to the respect of stricter regulatory requirements.

The tension among capital markets dictated by the need to be aligned to the banking regulatory standards at one side and the need to increase banks' profitability through the lending activity at the other side, becomes relevant to investigate on the investors' perceptions about the new liquidity that banks can benefit thanks to QE. New liquidity can bring different advantages. More specifically, 1) liquid assets give accessible ways to reinvest in other assets when prices are low; 2) liquid assets reduce same investing risks by ensuring that an investor will be able to quickly react to market moves (Brunnermeier, 2002). Because of the feature to be flexible according to the needs of capital management choices as well as the reduction of risk management activities, liquidity assumes interesting connotations as source to adopt "dynamic" capital requirements mechanisms like the same capital buffers (conservative capital buffer and additional prudential capital buffers) against any potential financial turbulences. Liquidity is that instrument for banks to manage the tension between the accounting requirements and the banking regulation to appear profitable and it incentivizes the increase of trading operations and consequently the information opacity.

In this specific case according to the effectiveness of Euro QE programme, we predict to find among the Euro zone banking system a different market's assessment for those banks more or less exposed to financial troubles. In sum our predictions are to find:

Hypothesis 2: European banks that are perceived less financially stable and not economically sound in terms of capital adequacy, asset quality and risk-exposure ratios are valued by investors less potentially beneficial of QE intervention.

Banks represent an interesting setting to investigate how they are affected by particular country factors even though they are characterized by a unique regulation and supervision. European banks belong to different countries and they experienced different impacts of national regulatory interventions. Because of the different backgrounds we intend to imply in further analyses the presence of a stringent pre-existing liquidity regulation for banks provided in specific European countries. The pre-existing liquidity regulation has been treated in a prior study conducted by Onali et al. (2016), where they identify a different market reaction to the new liquidity regulation dictated by Basel Committee with the adoption of Basel 3 framework among European banks situated in UK,

Switzerland, Germany, Netherlands and Finland. Their empirical tests show that those European banks located in countries with prior domestic liquidity regulation display lower abnormal returns. These findings push to take into account the pre-existing liquidity regulation for our next analyses. Because the pre-existing liquidity regulation might reduce investors' expectations according to the QE benefits and the most part of the biggest banks are exactly in those countries providing first of all higher liquidity standards, we address the next hypothesis in the following way:

Hypothesis 3: European banks of countries with a pre-existing liquidity regulation are less sensitive to ECB intervention following the QE programme's goals..

1.3 Research Design

1.3.1 Data and Sample

We employ an ex-ante approach to identify the main events and features of QE programme detailed on ECB web site starting from the section how Public Sector Purchase Programme (PSPP) works [5]. In this way we listed the announcements (date, description, main objectives) to take in account for the development of the development of an event study described later. Because we intend to test the market reaction to QE announcements on the banking sector, we consider all the listed European banks, such as those banks situated in the area where QE programme would take effect. Data are gathered from Datastream Thomson Reuters Eikon for banks' stock prices, market value and book equity value, and market indexes. We keep the commercial and saving European banks in the sample, because of the importance of banking sector implied in the Euro QE programme as the first channel to support the European economic growth. Further we use the same variables for another group of banks situated in completely different geographical areas, such as US, China, India, South Korea, Japan and Australia. All these banks outside the European area belong to our control group, that we following employ for testing the market reactions among banks not affected by ECB's decisions.

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[5] https://www.ecb.europa.eu/explainers/show-me/html/app_infographic.en.html

For conducting the analyses at bank-level we consider the banks' accounting and financial annual data from the database Orbis Bankscope for the time period 2014-2015, precisely those years before the QE announcements identified in our study.

Finally we obtain a sample of 120 European listed banks that represent the group of banks of our interest to develop the further analyses. The control group is instead represented by listed banks situated in US, China, India, South Korea, Japan and Australia are included in our tests related to the overall market reactions to verify the magnitude for banks not subject to the QE programme treatment.

Table 1 presents the sample composition of European banks aggregated by country indicating if the same country belongs to the Euro zone, European Union (EU) and Quantitative Easing (QE). We also indicate that all the banks of our sample are under Basel regulation and thanks to the study's contribution conducted by Onali et al. (2016), we indicate which countries have adopted a pre-existing liquidity domestic regulation before Basel banking regulatory implementation following Basel 3 framework.

The data for firms refer to those characteristics identified in the three categories: 1) capital adequacy; 2) asset quality; 3) risk-exposure ratios. Capital adequacy includes the regulatory capital and the liquid assets ratios. The asset quality presents as interesting ratios the level of non- performing loans (NPL) as well as the relation of loan loss provisions over total loans. The risk weighted assets indicate how the same bank is exposed in terms of credit risks, market risks, operational risks and liquidity risks. The dimension of risk exposure has assumed a strong relevance also in the accounting studies after the last financial crisis. One of the main issues on which there is an ongoing increase of research studies is how the accounting regulation can affect banking regulatory ratios. These last one have become the first barometer to explain the banking sector's health. In our study we identify these banking ratios for the capability to indicate and to predict the banks' prior conditions in relation with the market assessments to the QE programme.

Table 2 reports means, median and the distribution of the percentiles of the European banks' balance sheet characteristics and regulatory variables employed in our analyses conducted at firm-level. Table 3 presents the correlation matrix of the same variables highlighting a negative and significant

correlation between the loan customer exposure and RWA (-0.535*) as well as between the regulatory capital ratio and the loans over total assets (-0.348*) and again the customer loan exposure (-0.159*)

1.3.2 Event Study Methodology

We conduct an event study to estimate the abnormal returns and the cumulative abnormal returns for the European banks around the six announcements related to the QE programme in the Euro zone among the years 2015-2016. Event studies have been previously used to assess the firms' stock prices behaviours around corporate events (Kothari et al. 2004) and macroeconomic shocks (financial crisis, illiquidity, TARP).

We adopt the Fama-French 3 factor model to test market reactions for each event date corresponding to the day in which the President of the European Central Bank, Mario Draghi, announces the starting of an extraordinary programme as the Quantitative Easing never experienced before in the Euro zone. All the announcements provide information, details and descriptions following which QE takes effect[6]. The aim of most changes related to the QE ongoing and functioning is because the original rules rapidly constrain the purchases in countries with low levels of public debt and it raises the need to expand the "universe of available debt securities occurring to the supranational agencies" [7].

We identify exactly six event-announcements:

1) Event one (*Ev_1*) (January 22, 2015) is the time in which the QE program is announced by the President of the European Central Bank, Mario Draghi. It describes the details of the program adopted for the first time in the Euro zone and never experienced before.

2) Event two (*Ev_2*) (March 5th, 2015) corresponds to the beginning of the QE program through ECB's assets purchases of a monthly amount corresponding to € 60 billion.

3) The third event (*Ev_3*) (April 15th, 2015) corresponds to the announcement ECB approves amendments to the initial list of agencies located in the Euro area issuing securities (corporate bonds) that are eligible for the PSPP. In that sense new future assets are included in this extraordinary program.

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[6] https://www.ecb.europa.eu/mopo/implement/omt/html/index.en.html

[7] http://bruegel.org/2016/02/the-european-central-banks-quantitative-easing-programme-limits-and-risks/

4) The fourth event (*Ev_4*) (March 10th, 2016) is the time ECB announces the Corporate Sector Purchase Program (CSPP) and the APP increase of monthly purchases to € 80 billion until March 2017.

5) The fifth event (*Ev_5*) (April 21st, 2016) is the time ECB starts buying assets for € 80 billion per month and it announces the details of the Corporate Sector Purchase Program (CSPP).

6) The sixth event (*Ev_6*) (July 22nd, 2016) it is announced QE will be carried out until the end of 2017 and in any case until the Governing Council sees a sustained adjustment in the path of inflation that is consistent with its aim of achieving inflation rates below 2%.

We conduct the event study computing the Fama and French (1993) 3-factor model abnormal daily returns. We consider the daily stock price, the market value and the book value of equity for each listed bank and the daily price of the main financial market indexes of each country. We choose as short event windows a range of three days (-1; +1) and five days (-1; +3) or (-2; +2) for the computation of cumulative abnormal returns. The estimation period is based on a range of twenty-five working days prior to announcement (-30; -5); we excluded using alternative and longer observation windows (-60; -5) to avoid overlapping event windows related to QE announcements. Without overlapping the estimation periods and the event periods and controlling for the presence of other confounding events, we provide estimators for the parameter of the normal return model that are not influenced by the returns around the event. Including the event window in the estimation of the normal model parameters could lead to the event returns having a large influence on the normal return measure. In this situation both the normal returns and the abnormal returns would capture the event impact.

Specifically, the three factors in 3-factor model are: market return (R_t^{MKT}), size portfolio return (SMB_t) and book-to market portfolio return (HML_t).

$$R_{it} = \beta_0 + \beta_1 R_t^{MKT} + \beta_2 SMB_t + \beta_3 HML_t + \varepsilon_{it}$$

(Eq.1)

To calculate the daily abnormal returns around different event windows we compute the abnormal

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returns (ARs_{it}) are the difference between the observed returns and market return (R_t^{MKT}), size

portfolio return (SMB_t) and book-to market portfolio return (HML_t).

$$ARs_{it} = R_{it} - \beta_0 - \beta_1 R_t^{MKT} - \beta_2 SMB_t - \beta_3 HML_t + \varepsilon_{it}$$

(Eq.2)

The abnormal returns are a direct measure of an unexpected change in a stock price associated to the

event under consideration. An abnormal stock price effect associated with an un-anticipated event

should be observed if the event has information content. Indeed information is defined "material"

when the abnormal return is statistically significant, because the difference between the returns and

the predicted returns has an economic sense. QE announcements represent an exogenous shock in an

economic context: 1) they can change significantly banks' behaviour or incentives; 2) the same banks

of our sample are not directly chosen to be treated by this shock (Atanasov and Black, 2016).

Aggregating the ARs over each event window we calculate the cumulative abnormal returns (CARs)

for each stock price.

1.3.3 Model for Cross Sectional Analyses

As discussed earlier, we also test for cross-sectional variation (hypotheses H2 and H3) in banks stock

price reactions to the key events corresponding to the announcements of QE programme. We

concentrate our efforts to investigate on those bank characteristics that might influence investors'

valuation, such as the prior conditions of the European banking sector before QE would take effect.

We use the regulatory ratios used under Basel framework to verify the financial soundness and

stability of a bank. These ratios have been particularly emphasized also in prior studies highlighting

how the supervision role by ECB can improve the loan quality among European banks (Ertan et al.,

2017). It is also evident that those banks under the supervision through stress test exercises and wide

transparency exercises are the biggest banks in the EU. The bank characteristics identified for our

analyses, such as the capital adequacy, the asset quality and the risk-exposure, have been particularly

considered in prior studies which empirical evidences have contribute to the arise of bank contagion

literature (Kufman, 1994; Khan, 2010; Bowen et al., 2010) and the relevance of bank risk exposure in accounting literature (Gertler et al., 2012).

The capital adequacy that includes the regulatory capital and liquidity ratios. The regulatory capital is proxied by the Tier1 ratio (*Tier1*). There are different targets of capital, such as the book value capital, the fair value capital, the market capitalization and the economic capital. Regulatory capital includes book value of common shares, paid in capital, retained earnings, less goodwill, and any other intangibles plus other instruments subordinated to subordinated debt, have no fixed maturity and no embedded incentive for redemption and for which a bank can cancel dividends or coupons at any time.

The bank level of liquidity is represented by the ratio of liquid assets to total assets (*LiquidASS/TA*) that measures the bank soundness and the ability to sustain its lending activity. Concerning the asset quality that has assumed a particular relevance from the perspective of the banking supervisor (e.g. the stress tests and the transparency exercises by ECB-EBA), we include: 1) the customer loan exposure (Laux and Reuter, 2016) as the relation between the total customer loans and the total customer deposits (*Customer Loan Exposure*); 2) the relation of total loans over total assets (*Loans/TA*); 3) the annual asset growth rate, as the percentage growth of total assets over the previous 12 months (*Asset Growth*) .

The risk exposure explanatory variable has been identified in the risk weighted assets ratio (*RWA*) such as that solvency ratio that indicates the proportion of risk weighted assets over the deposits and short-term funding. The risk weighted assets minimum requirement would be increased at the threshold of 12.5%, which regulatory capital and capital buffers would absorb moderately any financial impact. It makes sense also to consider this ratio according to the important relation between regulatory capital and the RWAs: more increase the regulatory capital, more decrease the RWAs. The RWAs consider the bank's risk exposure observed in terms of credit risk, liquidity risk, market risk and operational risk.

The model to test the Hypothesis 2 and Hypothesis 3 includes as dependent variable the cumulative abnormal returns*, CARs* for all the events and as explanatory variables the banking

features that influence the banks' valuation of investors and other regulatory factors that can mitigate the benefits of the new liquidity injection by ECB. These last regulatory factors reflect a country dimension according to the experiences shared by more than one country on particular issues as the exposure to governmental debt as well as the adoption of more stringent ratios on liquidity before Basel regulation (Onali et al., 2016). For each group of countries we create a dummy variable for distinguishing why some countries are included or not for our analyses. Therefore, the prior empirical contribution on the presence of the pre-existing regulation on liquidity (*Pre-existing Liquidity Regulation)* witnesses that the banks of countries as UK, Switzerland, Germany, Netherlands and Finland have already experienced higher ratios of liquidity in their banking regulation to attenuate potential financial downturns. The presence of big banks in these countries as well as of banks that are identified to support a systemic risk with a particular attention to maintain an economic and financial equilibrium has induced in the past before the adoption of Basel 2 framework the need to provide more liquidity.

All the analyses incorporate aspects at individual-level emphasizing how a bank can appear sound and stable and consequently solvent given several considerations coming from inside and outside the same bank.

In sum, we adopt the following model:

$$CARs = \beta_0 + \beta_1 \; Capital \; Adequacy + \; \beta_2 \; Asset \; Quality + \beta_3 \; Risk \; Exposure + \\ \beta_4 Pre - Existing \; Liquidity \; Regulation + Controls + \; \varepsilon$$

(Eq. 3)

Prior empirical evidences about European banks show that in the post crisis era, the ECB has served as the primary investor in the majority of asset backed securities (ABS) deals in the Eurozone and provided banks with a very important source of liquidity. Importantly, the ECB issued very high amounts at below market level interest rates for repo backed by ABS making this facility a preferable source of liquidity for Eurozone banks (Ertan et al., 2017). It is also showed that in presence of financial distress and low risk appetite banks are characterized by low regulatory capital, more assets recorded at fair value, poor asset liquidity, larger potential impairments and more trading assets

(Bowen and Khan, 2014). In this way investors' expectations might be focused to understand whether the weakest banks would be incentivized to invest again in better asset quality decreasing their leverage and improving their liquidity.

At the other side we know how the banks' financial and economic structure may make the difference according the goals of a central bank given the adoption of unconventional macroeconomic policies (e.g. TARP experience in U.S.). Because of prior mixed evidences further analyses are focused to verify whether under-capitalized banks are perceived differently from the well capitalized banks. Knowing that QE intervention has the aim to reactivate the lending channel for the SMEs, we want to investigate whether market assessments are more pronounced for those banks that are or not aligned with Basel ratios, particularly in terms of capital ratios. We employ the threshold of 15% corresponding to the Common Equity Tier 1 (CET1) fixed by Basel regulation to distinguish the two categories of European banks, such as the well and the not well capitalized (Bowen and Khan, 2014).

1.4 Empirical Results

1.4.1 The Overall Market Reaction

We first provide an outlook on the results obtained through the development of the event study around the six event windows reported on the following Table 5 and Table 6. In Table 5 CARs are categorized on the base of the number of days for the event-windows (-1; +1), (-2; +2), (-1; +3), considering the all events and by country as well as by clusters of countries. Table 6 presents the findings obtained for each event-window composed by three days (-1; +1).

It is immediately evident from Table 5 a positive and significant reaction for all clusters of countries, while looking into the details of each country, we have obtained different results in the Euro zone. We can observe for the event-windows (-1; +1) and (0; +1) a positive and significant reactions for the banks in Italy, Belgium, France, Cyprus, Germany, Spain, Denmark, Norway, Sweden, Switzerland and UK.

The analyses which results are reported in Table 6 show the different results obtained for each event window (-1; +1) for the 6 events by country. The results confirm our expectations to find a negative and significant reaction for the third event. In this case ECB announces the implementation of the

QE programme including the corporate bonds issued by supranational agencies and not hold by commercial banks. Investors perceive negatively this announcement into the respect of the potential effects for the European banking system.

1.4.2 Cross Sectional Analyses of Cumulative Abnormal Returns

Following the development of the event study we raise some more specific research questions about 1) which bank factors might influence the banks' valuation from the investors' perspective and 2) why investors might have perceived or not a potential beneficiary economic impact first among the entire European sector and later on some specific banks.

Table 5 presents the results related to the hypotheses 2 and 3. The first findings show that in cross sectional tests the distribution of stock price reactions is consistent with investors worrying or not totally confident about the financial difficulties faced by European banks according to the ECB goals. We find a positive and significant association between the CARs and the liquidity ratio as well as with leverage and total assets growth. Banks have surely the opportunity to increase its liquidity ratio, but at the same time it is expected a reduction of risk weighted assets. This point is crucial if we think about how the same regulator has addressed all the efforts to increase the threshold of the RWA to allow a sort of buffer for banks to attenuate any kind of financial turbulences generated also by different factors summarized as market risks, liquidity risks, credit risks and operational risks. It is plausible that the new liquidity might be addressed by banks to increase their risk exposure buying new assets, such as other governmental bonds, as well as issuing new credit without having a strong funding side. The short term funding ratio creates a sort of vulnerability into the respect of longer term assets and this is the first distortion allowed in the banking system. The new Basel framework (Basel 3) has added a new ratio, the net stable funding ratio (NSFR), that will conduct to rebalance the asset side with the liabilities side of bank's balance sheets.

Related to the hypothesis 3 we include in our regressions a cluster of countries (UK, Switzerland, Germany, Netherlands and Finland), such as those countries in the past have adopted higher liquidity ratios (pre-existing domestic liquidity regulation) as suggested by Onali's et al (2016) contribution. We find a negative relation between CARs and the pre-existing domestic liquidity regulation. Again investors' don't perceive any kind of benefits for those countries that got higher requirements of

liquidity ratios in the banking industry. These last considerations drive us to highlight how all European banks are valued more and more under an increased homogenous dimension given the presence of the same regulator and supervisor exercised by ECB together with the collaboration of the European Banking Authority (EBA).

1.5 Conclusions

We examine stock price reactions to the announcements of QE programme among the time period 2015-2016 experienced for the first time in the Euro zone and we investigate which how and why bank characteristics might influence European banks' valuation from investors' perspective. The extraordinary macroeconomic policy planed by ECB consists in purchasing assets of the public sector on the secondary market, mainly in European banks' portfolios, with the goal to inject new liquidity among the banking sector. The extant literature reflects high uncertainty about the effectiveness of QE and it is mainly focused to highlight the economic consequences of this unconventional programme. For these reasons we investigate which, how and why banks' characteristics might influence the market assessments of the European banking sector.

Because banks represent the first channel, through which ECB intends to reactivate the banking lending activity supporting SMEs' investments, we verify whether investors might see possible an economic recovery thanks to the banks' role. Concerns arise according to the financial difficulties faced by banks following the last biggest financial crisis and the sovereign debt crisis, and further the consequent credit crunch affecting strongly the entire European banking area.

We conduct an event study adopting the Fama and French 3-factor model to verify the overall market reactions of European banks to the announcements of QE programme as well as the market reactions for each of six events of different typologies (information, details, implementations). Our findings report a negative overall bank stock price reaction among the six QE announcements showing how it is not obvious to regain investors' trust just adopting a central bank solution to inject exactly the missing liquidity to retake investments in the real economy. Further, when we looked at the three banks' characteristics that could contribute to influence the investors' valuation on European banks, we find that the magnitude of stock price reactions are positively related to liquidity and leverage ratios, while negatively related to risk weighted assets. These results are consistent with stock market

participants worrying about the effectiveness of QE programme among a European banking sector heavily affected by the last financial diseases. In detail, considering the distinction between well or not capitalized banks, it seems that not well capitalized banks might not get more benefits than well capitalized banks and the financial stability acquired before the QE programme might address properly banks to behave according to ECB goals.

Before concluding, we want to highlight some limitations related to the cross-sectional analyses . We acknowledge that the OLS regressions with cumulative abnormal returns (CARs) as the dependent variable might be subject to the bias in the standard errors of the coefficients due to cross sectional heteroscedasticity in the residuals across financial institutions. In that sense a good improvement might come from the decision to apply the Sefcik and Thompson procedure as suggested in other prior studies (Bowen et al., 2010; Gao et al., 2018) .

In conclusion European banks are still too weak to react in short times and to support the growth of real economy. Furthermore on the base of the prior studies that consider banking liquidity aspects, this study confirms that "new" liquidity injection thanks to the ECB's extraordinary intervention can assume a positive expectation when banks are already well structured and have good asset quality.

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1.7 Appendix I - Variable Description

Variables	*Definition*
CARs	Cumulative abnormal returns model obtained from the computation of Fama and French 3-factor model (Dep. Variable)
Capital Adequacy Ratios	
Tier1	the ratio between the regulatory capital and the total amount of risk-weighted assets
LiquidASS/TA	the ratio of assets that include cash, non-asset backed held to maturity and available for sale securities, governmental bonds and securities purchased under agreements to resell over total assets
Asset Quality Ratios	
Customer Loans Exposure	customer loans over customer deposits
Loans/TA	total loans over total assets
Asset Growth	the percentage growth of total assets over the previous 12 months
Risk Exposure Ratios	
RWA	the risk weighted assets over the deposits and short-term funding
Country-Liquidity Regulation	
Pre-existing Liquidity Regulation	equals to 1 for those countries that has a pre-existing domestic liquidity regulation (Finland, Germany, Netherlands, Switzerland, UK); 0 otherwise
Controls	
GDP Growth	Annual growth of GDP
Leverage	Total assets over total equity
Size	Natural logarithm of total assets
Not well-cap banks	equals to 1 if a bank is classified as "not well capitalized" , 0 otherwise, i.e. a bank is classified as not well capitalized when the Tier1 ratio is under the threshold (<10.00). In this category is included any category worse than well-capitalized, including "adequately capitalized", "undercapitalized" or "significantly or critically undercapitalized" (Bowen and Khan, 2014)

The data-source of the banks' accounting data is Bankscope Bureau Van Dijk

1.8 Appendix II – Event Study Timeline

Fama and French 3-Factor Model Cumulative Abnormal Returns (CARs)

- $R_{it} = \beta_0 + \beta_1 R_t^{MKT} + \beta_2 SMB_t + \beta_3 HML_t + \varepsilon_{it}$
- $ARs_{it} = R_{it} - \beta_0 - \beta_1 R_t^{MKT} - \beta_2 SMB_t - \beta_3 HML_t + \varepsilon_{it}$
- $CARs = \sum_{t=1}^{n} ARti$
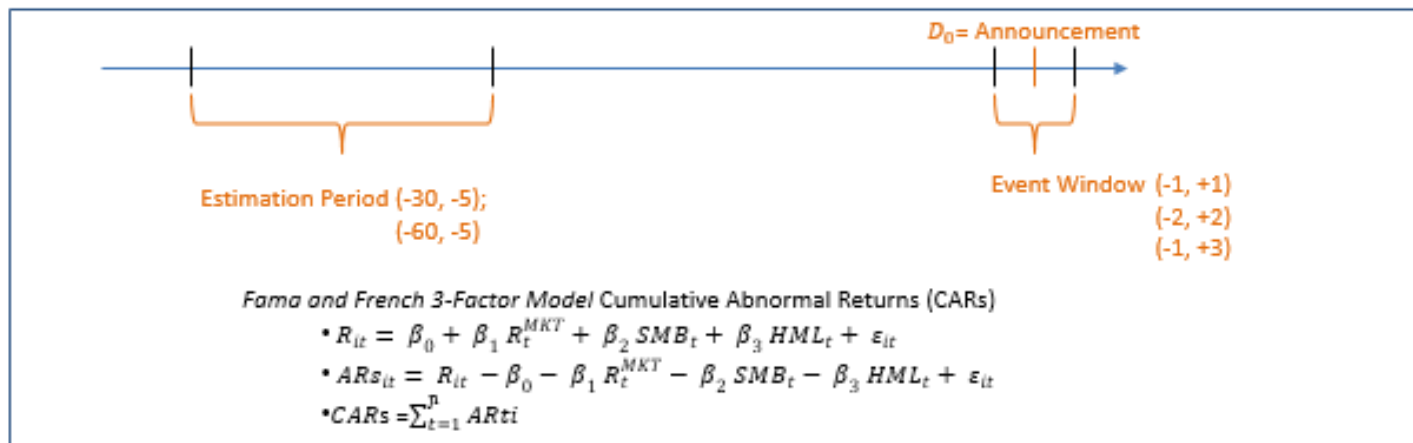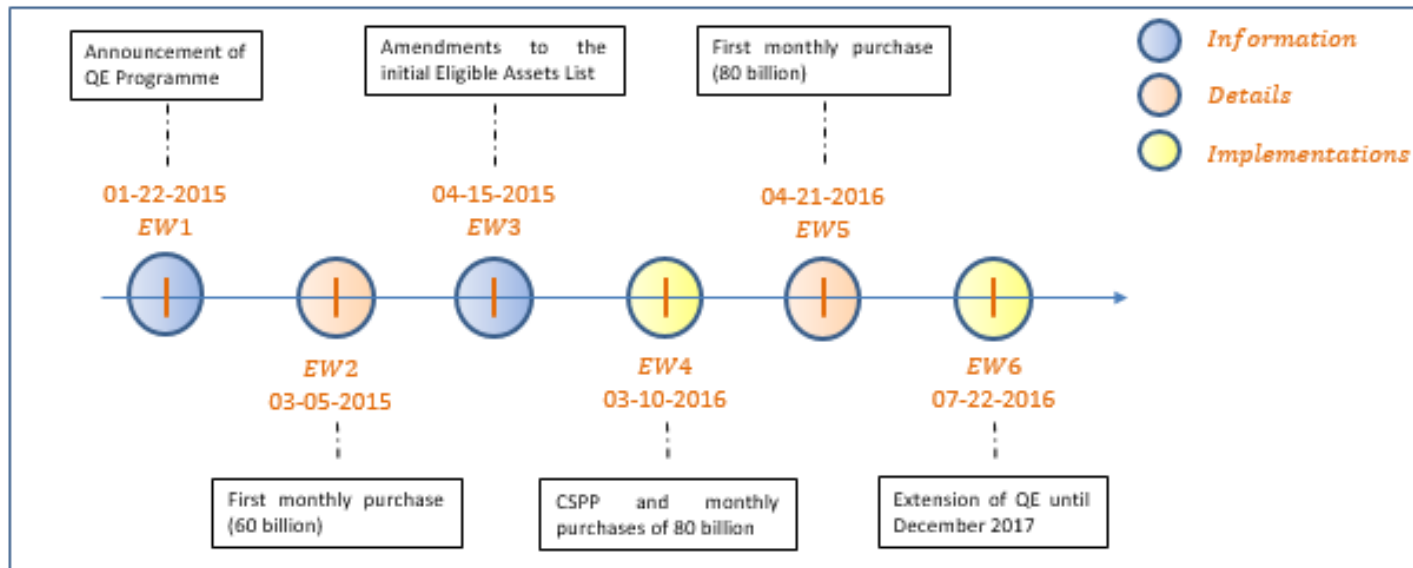
1.9 Tables

Table 1. Sample Composition of the European Banks

Country	Country Code	Nr. Listed Banks	QE	Euro zone	EU	Pre-Existing Liquidity Regulation
Austria	AT	6	Yes	Yes	Yes	No
Belgium	BE	1	Yes	Yes	Yes	No
Cyprus	CY	1	**No**	Yes	Yes	No
Finland	FI	2	Yes	Yes	Yes	**Yes**
France	FR	4	Yes	Yes	Yes	No
Germany	DE	5	Yes	Yes	Yes	**Yes**
Ireland	IE	1	Yes	Yes	Yes	No
Italy	IT	16	Yes	Yes	Yes	No
Malta	MT	3	Yes	Yes	Yes	No
Netherlands	NL	2	Yes	Yes	Yes	**Yes**
Portugal	PT	1	Yes	Yes	Yes	No
Slovakia	SK	3	Yes	Yes	Yes	*n.a.*
Spain	ES	6	Yes	Yes	Yes	No
Denmark	DK	22	**No**	**No**	Yes	No
Norway	NO	21	**No**	**No**	**No**	*n.a.*
Sweden	SE	4	**No**	**No**	Yes	No
Switzerland	CH	17	**No**	**No**	**No**	**Yes**
United Kingdom	GB	5	**No**	**No**	Yes	**Yes**
Total Banks		**120**				

** UK belonged to EU until June 23rd 2016
QE = countries under the programme of Quantitative Easing
Euro zone= countries which have adopted Euro currency
EU = countries member of the European Union
Pre-existing Domestic Liquidity Regulation = countries which have adopted higher liquidity ratios before Basel 3 Framework
All banks in all countries are subject to the Basel Regulation

Table 2. Descriptive Statistics of the European Bank Characteristics

Variables	Mean	Median	sd	p10	p25	p75	p90
CARs	-0.063	-0.065	0.085	-0.169	-0.119	0.002	0.047
Tier1	14.552	14.060	3.717	10.600	11.950	16.380	19.550
LiquidASS/TA	20.017	16.751	14.791	4.466	9.498	27.191	40.807
LiquidASS/DepSTfund	29.842	25.282	23.354	5.776	12.642	43.546	55.014
Customer Loans Exposure	113.838	109.154	42.679	67.043	87.203	133.199	172.562
Loans/TA	62.068	65.952	18.973	34.623	52.654	76.830	82.757
Asset Growth	5.630	3.226	15.711	-4.388	-0.982	7.249	14.205
RWA	15.571	11.855	13.659	1.256	6.616	22.461	32.065
GDP Growth	1.628	1.676	1.472	0.191	0.829	1.927	1.992
Leverage	1.190	1.182	0.037	1.153	1.166	1.205	1.234
Size (log of TA)	16.484	16.380	2.429	13.359	14.487	18.145	20.168

Table 3. Correlation Matrix

	Variables	1	2	3	4	5	6	7	8	9	10
1	CARs	1.000									
2	Tier1	-0.050	1.000								
3	LiquidASS/TA	0.127*	0.287*	1.000							
4	Customer Loans Exposure	0.074*	-0.159*	-0.278*	1.000						
5	Loans/TA	-0.003	-0.348*	-0.506*	0.530*	1.000					
6	Asset Growth	0.113*	0.093*	0.068*	0.291*	0.085*	1.000				
7	RWA	-0.093*	0.158*	0.370*	-0.368*	-0.535*	-0.048	1.000			
8	GDP Growth	-0.147*	0.034	0.159*	-0.019	0.028	0.120*	0.190*	1.000		
9	Leverage	-0.034	-0.213*	-0.180*	-0.130*	-0.086*	-0.036	0.046	0.023	1.000	
10	Size (log of TA)	0.237*	-0.198*	0.188*	0.258*	-0.005	0.030	-0.034	-0.132*	-0.460*	1.000

The table reports the Pearson correlation coefficients. (*****) indicating significance at 10% level

Table 4. Results of the Bank Stock Price Reactions

Panel A. Overall Market Reactions to the QE Programme Announcements of the European Banks and Other Banks

European Banks	Predicted Sign	CARs (-1;+1)	CARs (-2;+2)	CARs (-1;+3)
Overall	+/-	-0.051*** [0.024]	-0.109*** [0.004]	-0.106*** [0.004]
Early Events	+/-	-0.029*** [0.002]	-0.040*** [0.003]	-0.044*** [0.003]
Later Events	+/-	-0.061*** [0.003]	-0.143*** [0.005]	-0.137*** [0.006]

Other Banks (*)	Predicted Sign	CARs (-1;+1)	CARs (-2;+2)	CARs (-1;+3)
Overall	+/-	-0.022*** [0.001]	-0.025*** [0.015]	-0.022*** [0.001]
Early Events	+/-	-0.014*** [0.001]	-0.017*** [0.001]	-0.014*** [0.001]
Later Events	+/-	-0.026*** [0.001]	-0.029*** [0.002]	-0.026*** [0.002]

(*) These banks belong to other geographical areas extra Europe, such as US, China, India, South Korea, Japan and Australia
Early Events correspond to the Event_1 and Event_2
Later Events correspond to the Event_3, Event_4, Event_5 and Event_6

Table 4
(continued)

Panel B. Market Reactions of the European Banks to Each QE Programme Announcement

	Events Period	Description	Predicted Sign	CARs (-1;+1)	CARs (-2;+2)	CARs (-1;+3)
1	*January 22nd 2015*	QE program has been announced on January 22nd 2015.	+/-	-0.016*** [0.026]	-0.016*** [0.003]	-0.016*** [0.002]
2	*March 3rd 2015*	QE program starts for the first time on March 5th 2015. This program consists in purchasing assets for a monthly amount corresponding to € 60 billion.	+/-	-0.043*** [0.003]	-0.064*** [0.005]	-0.072*** [0.005]
3	*April 15th 2015*	ECB approves amendments to the initial list of agencies located in the Euro area issuing securities that are eligible for the PSPP.	+/-	-0.049*** [0.005]	-0.096*** [0.011]	-0.105*** [0.012]
4	*March 10th 2016*	ECB announces the Corporate Sector Purchase Programme (CSPP) (Not banking corporate bonds); an increase of APP monthly purchases corresponding to € 80 billion.	+/-	-0.064*** [0.006]	-0.138*** [0.011]	-0.125*** [0.012]
5	*April 21st 2016*	First monthly assets purchase of € 80 billion in APP. Furthermore, The Eurosystem starts to buy corporate sector bonds under the corporate sector purchase programme (CSPP) on 8 June 2016.	+/-	-0.067*** [0.007]	-0.161*** [0.011]	-0.148*** [0.012]
6	*July 22nd 2016*	The APP (or QE)is intended to be carried out until December 2017	+/-	-0.062*** [0.007]	-0.175*** [0.011]	-0.168*** [0.012]

Table 5. Results of Cross- Sectional Analyses of the Hypothesis 2 & Hypothesis 3

	All Banks & All Event Windows				All Banks & All Event Windows				All Banks & All Event Windows			
	CARs (-1;+1)	CARs (-1;+1)	CARs (-1;+1)	CARs (-1;+1)	CARs (-2;+2)	CARs (-2;+2)	CARs (-2;+2)	CARs (-2;+2)	CARs (-1;+3)	CARs (-1;+3)	CARs (-1;+3)	CARs (-1;+3)
Tier1	-0.001*	-0.0002	0.0004	0.0007	-0.0002	0.002	0.002	0.0008	0.001	0.003*	0.002	0.001
	[0.0007]	[0.0007]	[0.007]	[0.001]	[0.001]	[0.001]	[0.001]	[0.002]	[0.001]	[0.001]	[0.001]	[0.002]
LiquidASS/TA	0.262***	0.236***	0.236**	0.240***	0.142	0.128	0.128	0.113	0.259*	0.193	0.192	0.172
	[0.058]	[0.060]	[0.060]	[0.061]	[0.106]	[0.112]	[0.112]	[0.114]	[0.111]	[0.118]	[0.118]	[0.120]
Customer Loans Exposure	0.0001	-0.0003	-0.0003	-0.0005	0.0002*	0.001	0.001	0.0001	0.0003*	0.0001	0.0002	0.0002
	[0.006]	[0.0007]	[0.0007]	[0.0007]	[0.0001]	[0.0001]	[0.0001]	[0.0001]	[0.0001]	[0.001]	[0.001]	[0.0001]
Loans/TA	-0.125	0.0974	0.146	0.153	-0.617***	-0.353	-0.349	-0.38	-0.657***	-0.485*	-0.529*	-0.571**
	[0.105]	[0.1088]	[0.109]	[0.111]	[0.190]	[0.201]	[0.204]	[0.208]	[0.200]	[0.212]	[0.215]	[0.219]
Asset Growth	0.0003**	0.004**	0.004**	0.004**	0.0003	0.003	0.003	0.003	0.0003	0.0003	0.0003	0.0003
	[0.0001]	[0.0001]	[0.0001]	[0.0001]	[0.0002]	[0.188]	[0.0002]	[0.0002]	[0.003]	[0.0003]	[0.0003]	[0.0003]
RWA	0.0112***	-0.007**	-0.005	-0.005	-0.029***	-0.026***	-0.259***	-0.026***	-0.031***	-0.305***	-0.319***	-0.032***
	[0.003]	[0.003]	[0.003]	[0.003]	[0.005]	[0.006]	[0.006]	[0.006]	[0.006]	[0.006]	[0.006]	[0.006]
GDP Growth		-0.006***	-0.006***	-0.006***		-0.005	-0.005	-0.005		0.001	0.001	0.001
		[0.001]	[0.001]	[0.001]		[0.003]	[0.003]	[0.003]		[0.003]	[0.003]	[0.003]
Leverage		0.215**	0.249**	0.253**		0.382*	0.385*	0.369**		0.343*	0.311	0.291
		[0.084]	[0.084]	[0.085]		[0.002]	[0.158]	[0.160]		[0.165]	[0.167]	[0.168]
Size (log of TA)		0.006***	0.007***	0.007***		0.007***	0.007***	0.007***		0.008***	0.007***	0.007***
		[0.001]	[0.001]	[0.001]		[0.002]	[0.002]	[0.002]		[0.002]	[0.002]	[0.002]
Pre-existing Liquidity Regulation			-0.018**	-0.018**			-0.001	-0.002			0.016	0.016
			[0.005]	[0.005]			[0.110]	[0.011]			[0.011]	[0.011]
Not well-cap banks				0.002				-0.011				-0.014
				[0.007]				[0.148]				[0.015]
Intercept	-0.138	-0.699***	-0.805***	-0.825***	0.358	-0.477	-0.486	-0.398	0.274	-0.393	-0.297	-0.182
	[0.280]	[0.196]	[0.198]	[0.208]	[0.232]	[0.192]	[0.371]	[0.389]	[0.244]	[0.385]	[0.391]	[0.409]
Nr obs	711	711	711	711	711	711	711	711	711	711	711	711
R-squared	0.058	0.120	0.132	0.132	0.050	0.070	0.070	0.071	0.060	0.074	0.077	0.078
Prob>F	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Chapter 2

Investors' Reactions to Foreign Cash Holding Disclosure in the Banking Industry

2.1 Introduction

This paper examines how investors react to the new disclosure of the Country-by-Country Reporting (CbCR) related to the foreign cash holding in European banks' subsidiaries situated in countries different from the main residence country and following it highlights how investors value banks' cash holding when banks operate in tax havens or not.

In 2013 the European Directive CRD IV "*Access to the activity of credit institutions and the prudential supervision of credit institutions and investment firms*" introduces (Art. 89) the mandatory disclosure of the Country-by-Country Reporting (CbCR). The introduction of Art. 89 of CRD IV opens a new historical period in terms of financial transparency affecting the European banking sector. CbCR discloses sensible information on which it is expected to affect banks' tax avoidance if banks anticipate public scrutiny (Overesch and Wolff, 2017; Dyreng et al., 2015).

European Union is the first to oblige all the financial institutions to disclose new additional key business information of particular interest for investors, analysts, auditors, customers, regulator and supervisor. The CbCR indicates for each country where the bank is operationally active: 1) the turnover; 2) the profits and losses before tax; 3) the tax payments; 4) the list of subsidiaries and the type of main activities; 5) the number of employees; 6) the public subsidies received. Consequently, in 2014 European banks

provide for the first time this key business information not publicly known before that time.

Therefore, the disclosure of CbCR and specifically of foreign cash holding in banks assumes particular interest for the following reasons. Prior contributions show empirically that banks engage in international profit shifting or in tax saving (Huizinga et al., 2012; Bouvatier et al., 2017). The CRD IV regulation, including the CbCR, represents the first compulsory transparency initiative on a transnational level. It is recognized overall that CbCR responds to the need of higher transparency in the banking sector, but it may arise tension between the expected benefits and the content of such disclosure to unveil tax planning activities and the risk of trapped liquidity (Evers et al., 2016). If tax planning strategies induce aggressive tax avoidance (Hanlon and Heitzman, 2010), trapped liquidity leads to decrease the marginal value of cash because of high tax repatriation costs (Fabrizi et al., 2017). Among this last point another empirical evidence shows that both analysts and investors face higher uncertainty when-ò

Second, Basel 3 framework, incorporated in the package CRD IV regulation by EU, imposes guidelines on capital adequacy emphasizing the fundamental role played by liquidity as well as it promotes to cover regulation lacks in terms of transparency. CbCR attempts to fill the gap providing systematically more information about the bank cash geographical distribution. Cash arranges unconditional liquidity available every time bank managers intend to use it, when usually banking lines of credit provide conditional liquidity according to the duration for which borrowers continue to meet covenants (Lins et al., 2010). Some recent surveys among tax executives of U.S. firms show that managers are concerned with the reputational and political effects associated with corporate tax planning (Graham et al., 2014; Dyreng et al., 2016). The tax-related disclosure can impose political costs by altering interactions with tax authorities and damaging government contracting relationships. Further, reputational damages may also occur if investors or customers believe that a bank does not pay taxes engaging in significant activities in tax havens.

Third, because foreign cash can be held in subsidiaries located in countries where fiscal advantages permit to increase investment opportunities, it is also empirically shown that investors might perceive negatively foreign cash in tax havens in terms not just of reputational costs, but also as bank risks.

Investment opportunities might increase thanks to an accurate tax avoidance activity limited by direct costs of tax planning, tax advisors and management capacity (Jacob et al., 2014), but the same foreign cash held in tax havens might become a source just for satisfying managerial benefits taking the distance from investors' expectations and generating agency problems. Indeed, because cash generally has "no name", from a managerial perspective it might increase the power for a bank to take more risks (high risk-taking behaviours) playing a role out of investors' control.

Consequently, there is still much room on investigating whether investors value cash differently under the new "transparency umbrella" of CbCR according to the fact that we don't know how and why investors might perceive to the disclosure for the first time related to the amount of cash held in each bank foreign subsidiary. New economic insights might arise thanks to the introduction of CbCR in terms of reputational, political, agency and taxation risk costs.

The interest to investigate on CbCR starts from the reading of a document by Oxfam related the increased presence of European banks in tax havens, particularly mapping top 20 EU banks' reported profits in tax havens. Following I hand collected data related to the key business information included in the European banks' CbCR. Although the European Directive requires the disclosure of the CbCR, I obtain a sample of 62 listed banks disclosing the CbCR in 2014 and 121 listed banks not disclosing the CbCR. My identification strategy consists in identifying the date in which banks' CbCR is publicly known, such as the day in which this report has been published. Mainly the CbCR is part of the same banks' annual reports and in all these cases the date corresponds to be the day of annual reports' publication. Sometimes, mostly for largest European banks, I find that the CbCR is a document published in a moment following to the same annual reports and not included in themselves.

Given the importance of understanding the effect of the disclosure of foreign cash, first I conduct a short-event window study to test whether investors react to the announcements of this new disclosure upon the obtained sample of banks. Second, the paper analyses investors' reaction to the amount of foreign cash in European banks that disclose CbCR. In a further step I split banks' foreign cash in countries classified

or not as "tax haven" to verify whether investors value positively or not foreign cash when it is held in banks' subsidiaries situated in tax havens.

The main findings show that cash is valued overall positively by investors every time they know exactly where and how much it is held in other countries different from the headquarters' country. The new disclosure assumes positive connotations according to the need to increase transparency in the banking industry. Often empirical studies have shown how the banking industry is particularly recognized to be opaque for the high rate of trading activities and the unique regulation that still permits to adopt strategic discretionary choices of capital management. The empirical results of this study highlight that foreign cash is positively perceived, but every time that investors know exactly where foreign cash is held, they have a different reaction. Foreign cash held in tax haven countries is not positively valued and the reasons can be found in tax considerations as well as in managerial benefits. Banks have surely important investment opportunities thanks to foreign cash in tax havens, but this cash becomes a sort of trap in terms of tax repatriation costs and of satisfaction of managerial interests.

In detail, EU has country-members classified as tax havens. Also in this case investors react negatively when foreign cash is held in these European tax heaven countries and the reason can be explained also in terms of reputational risk. EU at one side requires mandatorily to disclose the CbCR and at the other side it permits still different levels of taxation advantages between the same European countries increasing investors' concerns. As robustness check I apply the Heckman model proposed in Leuz and Verrecchia (2000) related to the study of the economic consequences of increased disclosure. The Heckman model allows to test the presence of selection bias that can be viewed as an omitted variable problem in the selected sample.

This study contributes to the literature in more than one way. Until today we don't have much evidence about banks and taxation issues (Hanlon and Heitzman, 2010), starting from the decision to hold foreign cash in tax havens. The CbCR disclose key business information related to taxation issues for the first time and investors know this detailed information for each European bank. Mapping the

foreign cash of European banks in the world, it is evident a high amount of foreign cash in tax havens. Even though tax havens might represent further investment opportunities from investors perspective (Desai et al., 2006[8]), some concerns arise given the key business information about European banks.

If it is true that today national governments require banks to be the first channel to attract cash from abroad, and specifically from tax havens, incentivizing customers to join this programme under low tax rates that corresponds to lower repatriation costs (e.g. programme of "Voluntary Disclosure"), it is also evident that reputational problems and political backlash may arise immediately according to the goal of CbCR regulation that implies for European banks the compulsory disclosure related to the foreign cash in banks' subsidiaries.

Focusing on tax havens academic interest has recently been renewed, because if tax havens were before classified as those countries with low welfare rate and significantly poor, today tax havens are present in EU area incentivizing fiscal distortions according to the EU transparency goals. The need of transparency is particularly required in the banking sector and CbCR is sure one of the first response according to Basel 3 framework. From the first results we know that a group of banks is aligned to the CbCR requirements in 2014, but still a lot of financial institutions should do more efforts to be compliant. The fact that some financial institutions chose not to comply with the EU law suggests that the cost of disclosing detailed information on subsidiaries was greater than the benefit of a more complete information environment for the noncompliant firms (Dyreng et al., 2016).

In the next sections: 1) I present prior studies' contribution according to the increase of disclosure and foreign cash literature; 2) I illustrate data sources and the sample; 3) I describe the methodology adopted for the event study and the models to test my main hypotheses; 4) I report the main findings including some additional tests; 5) and finally I intend to highlight the implications and economic insights of this study.

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[8] Desai, Foley and Hines (2006) suggest that the reduced tax costs of doing business in tax havens stimulate investment in nearby high-tax countries.

2.2 Background and Hypotheses Development

2.2.1 Prior Literature

In this section I intend to outline the main empirical evidences related to: 1) the CbCR mandatory disclosure as instrument to increase transparency and 2) foreign cash holding in tax considerations and agency problems.

The CbCR represents a fundamental further step according to the need to reduce opacity among the European banking system (Bouvatier et al, 2017). The proponents of CbCR claim the importance to detect abusive tax arrangements and argue that this kind of disclosure exercises a sort of pressure among companies to pay a fair amount of tax in relation to their economic activity in each country (Evers et al, 2016). The EU CRD IV (July, 2013) is the first initiative of mandatory disclosure for all the European financial institutions that it has been effective since 2014. Financial institutions, hereafter banks, indicate in the CbCR document a list of new key business information for each country where they are active: 1) the turnover; 2) the profits and losses before tax; 3) the tax payments; 4) the list of subsidiaries and the type of main activities; 5) the number of employees; 6) the public subsidies received. The CbCR document can be included in the banks' annual reports as well as a unique report published apart and in a further moment. Even though this CBCR disclosure is mandatory for all the financial institutions located in EU countries, it is also verified that until today banks generally have no penalties if they decide to not disclose this additional information (Overesch and Wolff, 2017).

CbCR is particularly concentrated on the information related to cash holding and literature background highlights how cash plays a crucial role in banks. Cash provides unconditional liquidity available at any time, in both good and bad times (Lins et al, 2010). Furthermore, information asymmetry between managers and capital markets makes cash more valuable when the cost of external capital is higher. Cash is a fungible asset that can be easily diverted and banks as well as other companies belonging to other industries have several motivations to hold cash. It's because they can 1) manage

uncertainty; 2) face future potential financial turbulences generated by capital markets or by regulatory restrictions; 3) hedge risks; 4) be more competitive (cash flexibility); 5) manage capital choices; 6) develop a shadow banking to appear still profitable. In sum, cash held domestically or abroad is the first source of liquidity for banks and it assumes features to get a good buffer to attenuate negative economic effects. Indeed, every time that banks face financial diseases, they tend to increase immediately the level of cash holding as well as to increase cash flow sensitivity. Specifically, the increase in cash mitigates also underinvestment problems generated by the presence of bad-loans. Again cash holding assumes a precautionary motivation (Opler et al, 1999; Almeida et al, 2004; Han and Qiu, 2007; Bates et al, 2003; Chang et al, 2014; Harford et al, 2014).

One of the most debated questions is why firms hold so much cash and one possible answer is founded on tax explanations. Effectively an interesting study conducted by Pinkowitz and Williamson (2001) show that Japanese firms hold significant higher levels of cash than firms from US (Rajan and Zingales, 1995). They discover that also German firms hold cash at the same level of American firms, but the German system is characterized to be bank-centred exactly as the Japanese one. At that point Pinkowitz and Williamson investigate on what exactly determines those high levels of cash holding for Japanese firms. The main findings show that the motivation lies in the power of country principal banks which appropriate rents from industrial firms. Secondly Japanese banks prefer firms to hoard cash rather that to use it to pay down their debt. The association of high levels of cash holdings in firms and the power of the banking system can be translated in other words with agency costs of a bank-centered system without other monitoring forces, such as nonbank block holders or well-developed capital markets. Foley et al. (2007) show that U.S. multinational firms hold cash in their foreign subsidiaries because of the tax costs associated with repatriating foreign income.

Thanks to the introduction of compulsory CbCR, banks disclose precisely for the first time the amount of foreign cash held abroad for each country. This data is relevant considering that until today we have not so much empirical evidence on foreign cash holding in banks and at the same time we don't

have much evidence on the taxation of financial securities or financial institutions (Hanlon and Heitzman, 2010). Financial institutions are usually dropped from the sample because of concerns related to the unique banking regulation, specific ownership structures, addicted financial reporting incentives, a crucial role played to support the growth of the entire economy. Generally, firms with foreign operations move and generate large amount of cash first in their foreign subsidiaries because of costs for repatriation tax on foreign cash every time they intend to bring it home. Thakor (2013) shows that shareholders assign a higher value to foreign cash instead of cash held domestically for the higher investment opportunities abroad. Splitting cash in foreign cash and "home" cash prior studies suggest that foreign cash could be valued less than domestic one for costs of repatriation tax and for the presence of agency problems (Campbell et al., 2014; Bryant-Kutcher et al., 2008).

Shuo Yang (2015) investigates on the factors that affect foreign cash holdings differently than domestic cash holdings, such as repatriation tax, agency problems and growth opportunities. The empirical results show that foreign cash holdings are only a concern when investors have limited control over them and keeping cash offshore in presence of foreign growth opportunities is a real benefit for American companies.

Moreover, foreign cash holding may be also the result of an aggressive tax planning. In this case companies can choose locations abroad, where they can reduce taxation costs and increase managerial benefits. These locations that present particular tax advantages are better known under the name of "tax haven". Tax havens have surely attracted the attention of not just investors but also of policymakers during these last years because of the recent taxation scandals as "Panama Papers" and "Bahamas Leaks" both in 2016, "Swiss Leaks" in 2015, "Offshore Leaks" in 2013[9]. In all these cases banks acted as agents to shelter corporate and private wealth from public scrutiny involving also intermediaries as lawyers and tax advisory firms. The biggest European banks have facilitated this business particularly in to the

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[9] "Opening the vaults: the use of tax havens by Europe's biggest banks" Oxfam
    https://www.oxfam.org/sites/www.oxfam.org/files/bp-opening-vaults-banks-tax-havens-270317-en.pdf

direction of three main tax havens: Switzerland, Hong Kong and Luxembourg. The specific interest in tax havens reflects the disproportion that they exercise in the world economy under two corporate perspectives of international tax competition and tax avoidance. The motives that multinational corporations decide to establish their foreign subsidiaries in tax haven countries have not been well explored, but what we know today are the common features among tax havens (Bennedsen and Zeume, 2015). Banks are surely under the pressure to get foreign subsidiaries in tax havens to meet the economic needs of their customers (individuals and corporate firms), but at the same time banks' insiders may obtain personal benefits from establishing tax haven subsidiaries. These personal benefits may represent a disadvantage in terms of costs for the shareholders themselves.

The main contribution in terms of tax research comes from the literature review realized by Hanlon and Heitzman (2010). They emphasize that accounting-based measures of tax avoidance are not ideal for international studies because differences in the book-tax gap can be due to differences in accounting rules or due to differences in expropriation of outside shareholders. Prior studies have also marginally considered the Tax Information Exchange Agreements between 2001 and 2011. Johannesen and Zucman (2014) show that after the passage of these agreements bank deposits are shifted from affected to unaffected tax havens.

The link between banks and tax havens lies in bank secrecy laws that provide the assurance to not disclose any information about corporate and individuals' income to the home country. Tax havens become the perfect location for tax evasion and banks play a double role in that sense. Banks facilitate this mechanism for companies and individuals as well as for the banks themselves.

Before EU has introduced the CbCR mandatory disclosure for all the European financial institutions, OECD persuaded tax haven countries to agree to information-sharing arrangements. The impact of the introduction of these arrangements remains uncertain and specifically not significant examining the foreign portfolio investment in Cayman Islands and other tax haven countries (Kudrle, 2008).

2.2.2 Research Hypotheses

The CbCR mandatory disclosure introduced by the European Union for all the financial institutions represents an important step to increase the banking transparency in the information environment. Investors can finally know the precise amount of cash that all the European banks have domestically and abroad in each foreign country.

Cash is an important element of liquid assets in banks' balance sheets and investors value the economic soundness and the financial stability of a bank according to the liquidity ratio. Cash holding presents several features which make it unique. Cash is 1) unconditional; 2) flexible; 3) risky and 4) anonymous. Because cash can be held in banks' home country as well as in their subsidiaries abroad, first I intend to verify whether investors react to the new disclosure "CbCR" published in banks' annual reports or apart. I expect to find a positive reaction because the introduction of CbCR mandatory disclosure represents a further step to reduce the banking opacity in information environment as suggested in prior studies.

Hypothesis 1: Investors react (positively) to the announcement of CbCR mandatory disclosure related to cash holding for the European financial institutions.

Through the CbCR mandatory disclosure investors know exactly the amount of domestic cash and foreign cash for the first time and they can also verify in which country banks hold cash. The institutional theoretical framework suggests each country reflects particular characteristics and investors consider them according to their capital allocation's choices. Specifically, banks can increase their internationalization process opening foreign subsidiaries where to develop their business in terms of investments and lending activities. Before all these considerations investors are aware that banks' foreign subsidiaries can be located in countries with particular taxation advantages. I identify those countries better classified as "tax havens" to test how investors react to the disclosure of cash held abroad. Because prior studies suggest investors' concerns in terms of repatriation tax and managerial benefits, I suppose to find a negative reaction for banks' cash holding in tax havens.

Hypothesis 2: Foreign cash is valued less when it is held in European banks' subsidiaries located in "tax haven" countries than in other countries different from the main residence country.

Tax havens present geographical and institutional features. They are often small islands or small countries with low investors' protection rights not so far from the economically biggest and most powerful countries. Looking at the world map it is evident that also the same European Union member countries are surrounded by tax havens and are also classified in some cases as tax havens. The CbCR mandatory disclosure has the main goal to induce banks to be transparent informing investors and all parts interested in analysing banks' financial statements about banks' presence in countries with tax advantages. The CbCR assumes connotations of tension between the need to reduce banking opacity and the banks' strategic choices in terms of tax payments. It is also true that European regulator's efforts, specifically European Commission, are addressed to reduce differences among European countries in terms of speed in adopting new regulation and reducing prior legal conditions. The CbCR mandatory disclosure is a further step also to introduce uniform rules in the banking industry overtaking the national regulation. Because the presence of tax havens in European Union area can induce investors to have some concerns related to the cash holding in their foreign subsidiaries, I predict to find a higher negative reactions for cash holding in European tax havens.

Hypothesis 3: Foreign cash is valued more negatively when it is held in European banks' subsidiaries located in European "tax haven" countries than in other "tax haven" countries.

2.3 Research Design

2.3.1 Data and Sample

Since disclosing foreign cash holding for European banks is thanks to the introduction of CbCR mandatory disclosure (EU CRD IV, July 2013), I focus on listed European financial institutions proposed by Bankscope from 2013 until 2014, including commercial and investment banks and insurance financial companies, located in the 28 EU member countries.

For each financial institution I verify whether CbCR has been published in 2014, such as the first year in which the regulation has taken effect. I find that some banks have published the CbCR in the annual report, others in a document apart, others have not completely disclosed CbCR. For each bank I identify the date of the day in which the banks' CbCR document have been published.

For the banks that provide foreign cash holdings information I hand collect the data related to the CbCR documents. I identify the key business information for each country where the bank is active with its subsidiaries, such as those additional information that compose the CbCR document, in particular: 1) the turnover; 2) the profits and losses before tax; 3) the tax payments; 4) the list of subsidiaries and the type of main activities; 5) the number of employees; 6) the public subsidies received.

Finally, I obtain a sample of 183 European financial institutions, such as 62 disclosing CbCR document in 2014 and 121 not. It is evident that even though the regulation has taken effect in 2014 a big portion of European banks have decided to not disclose the CbCR document. I assume that this doesn't mean that these banks don't have any foreign subsidiaries. I presume that this situation is aligned with the findings proposed by Dyreng et al. (2016) following which some financial institutions chose not to comply with the EU law because of higher costs of disclosing detailed information instead of benefits. Furthermore I obtain all the financial annual data of the listed European banks included in the sample from *Bankscope*, while the stock prices of the listed banks and the country market index prices from *Datastream*.

2.3.2 Event Study Methodology

I conduct first a short-event window study identifying as event dates the day in which the CbCR document has been published for the first time in 2014 by the European banks. Assuming the hypothesis of markets' efficiency I adopt a market model and I consider an estimation period of 25 days (-30, -5) before the event date (time 0) and an event window of two days (0, +1) including the event date. The short event window permits to verify the magnitude of the cumulative abnormal returns (CARs) around the day in which investors know the information reported in CbCR documents.

I also verify to not include in the timeline of the study other confounding events, such as for example taxation scandals to measure correctly the magnitude of the market reactions.

2.3.3 Multivariate Data Analysis

CbCR mandatory disclosure for financial institutions has taken effect in 2014 thanks to the regulatory intervention of European Commission with the CRD IV "*Access to the activity of credit institutions and the prudential supervision of credit institutions and investment firms*" (July, 2013). The CbCR mandatory disclosure represents an important regulatory improvement in terms of transparency for the entire European banking sector. In this way the new disclosure makes available publicly new key business information for the first time. This additional information mainly provides how much cash European banks hold for each of their foreign subsidiaries and in which countries they are present with their activities. Based on these considerations I intend to test the first hypothesis adopting the following model:

$$CARs = \beta_0 + \beta_1\ Disclosure + \beta_2\ Tot\ Cash_{TA} + \beta_3\ Disclosure * Tot\ Cash_{TA} + \beta_4\ Controls + \varepsilon$$

(Eq. 1)

The model intends to capture the association between the cumulative abnormal returns (CARs) computed before through the development of the short event-window study (0,+1) and the main explanatory variables. *Disclosure* is computed as a dummy variable equal to 1 if the bank discloses CbCR document,

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0 otherwise. *TotCash_TA* is the total cash and equivalents divided by total assets. The interaction term *Disclosure*TotCash_TA* intends to capture the total cash when it is known as domestic cash and foreign cash given the CbCR disclosure. This last variable assumes a particular interest according to test the first hypothesis focused on verifying the market reactions to the disclosure of cash holding among the European financial institutions. Banks are often described as a world apart into the respect of other industries for the unique regulation, the economic role played inside the banking system and outside for supporting the economic growth. It is often debated also the specific opacity of the banking industry and every time that regulation introduces mandatorily new disclosure, it is possible to know something that before was not known or voluntarily disclosed but not in a systematic way.

As control variables (*Controls*) I identify: *ROE*, returns on equity; *Leverage*, total assets to equity; *Size*, the logarithm of total assets. The control variables included in the model are relevant, because they capture the different dimensions in terms of profitability and business among banks which present a significant heterogeneity as prior literature suggests.

Further I decide to consider the treatment group of those European financial institutions that disclose CbCR document for the first time in 2014. This treated group is composed by 62 banks, mainly the largest banks of European Union. I adopt a model that identifies the foreign cash holding under more different aspects to test Hypothesis 2 and Hypothesis 3.

$$CARs = \beta_0 + \beta_1\ Foreign\ Cash\_TA + \beta_2\ Tot\ Cash\_TA + \beta_3\ Controls + \varepsilon$$

(Eq.2)

In this model the explanatory variable of main interest is *Foreign Cash_TA*, such as the total foreign cash held by each bank in foreign subsidiaries by total assets. Following the *Foreign Cash_TA* is split in two parts, such as the foreign cash by total cash held in "tax haven" countries (*Tax Haven ForeignCash*) and the foreign cash by total cash held in "not tax haven" countries (*No Tax Haven ForeignCash*). Following I split again the foreign cash held in tax haven countries that are located in EU area or are EU member

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countries (*EC Tax Haven Foreign Cash*) and not (*No EC Tax Haven Foreign Cash*).

In both models I decide to include the *country fixed effects* because many factors at country level might influence the results in the moment in which I intend to verify the association between CARs and disclosure in foreign cash holding as well as CARs and foreign cash holding in other countries different from the main residence country of the European banks.

2.4 Empirical Results

2.4.1 Descriptive Statistics

The summary statistics present the two groups of listed financial institutions that compose my sample. It is possible to identify a group of banks (121 banks) that don't disclose the CbCR document in 2014, when for the first time the regulation has taken effect. The other group is composed by those European banks that disclose the CbCR document and it contains just 62 banks. These banks with the CbCR disclosure are the largest banks of EU and with a higher presence of foreign subsidiaries according to the process of expansion and internationalization. They present more interesting data both in terms of profitability (higher ROE) and leverage (lower ratio) into the respect of the major group of banks that don't present CBCR disclosure.

2.4.2 Main findings

I run more regressions to test Hypothesis 1 including control variables and country fixed effects. Table 3 reports the findings related to the first hypothesis. Investors' reactions are positive and significant for the interaction term (*Disclosure*TotCash_TA*) of major interest also when I introduce the other control variables and country fixed effects. While *TotCash_TA* and *Disclosure* are negatively associated with CARs, the interaction term is significant and positive. These results show that investors value positively the introduction of the new compulsory disclosure having more details about the distribution of the total amount of total cash. The new additional key business information listed in the CbCR document allows

to distinguish the domestic cash and the foreign cash held by each bank disclosing the CbCR.

Splitting the foreign cash held by European banks in their foreign subsidiaries in "tax haven" countries or not, I find that investors react negatively (and significantly) in case of "tax haven" countries. These results confirm that investors perceive foreign cash as a sort of trap to respond to the managerial needs and because of higher costs in case of repatriation tax. Table 4 presents the results related to the Hypothesis 2 and even though the total amount of foreign cash is positively and significantly associated to CARs, foreign cash is valued less when it is held in "tax haven" countries. Investors appear to not consider that cash a good source according to the expectations of future potential increase of profits of investment opportunities growth.

Table 5 presents the results related to the Hypothesis 3. Splitting again the foreign cash in "tax haven" countries I identify whether these countries are geographically located in the European Union area or are European Union member countries. Because EU regulator, specifically European Commission, is involving each European member country in a process of harmonization under the same "regulatory umbrella", investors present again concerns and react negatively when the European banks hold foreign cash in European tax havens. CbCR compulsory disclosure is an instrument through which investors might guess about banks' tax planning activities, but even though the opacity is reduced in banking information environment, cash holding in European tax haven might have a bad reputational impact on the same European banks. Also in presence of a process of regulatory harmonization for the banking system, countries present still differences in terms of tax advantages.

The CbCR disclosure assumes interesting economic insights according to my analyses. Transparency has increased thanks to the CbCR providing new key business additional information. Also in presence of more information investors confirm their concerns about foreign cash every time a European bank hold cash abroad in a "tax haven" country. Verifying the kind of activities conducted in the foreign subsidiaries in tax havens, mainly investment activities, my findings are consistent with those considerations about the negative influence of foreign operations located in tax havens coming from

prior contributions (Dyreng and Lindsey, 2009). The choice of a bank to operate in tax havens represents a damage for the economic environment in terms of competitiveness according to the transparency rules. Finally, foreign cash in tax havens becomes trapped liquidity available just to respond to the managerial needs. Investors recognize a unique flexibility how banks' managers can manage liquidity according to their strategies and risk-taking or risk-shifting behaviours. Further cash is unconditional and anonymous and it is the perfect asset included in liquidity ratio to hide risky daily transactions.

2.5 Additional Tests

The results obtained testing the Hypotheses 2 and 3 focused on the subsample of banks that disclose CbCR may induce to arise concerns related to the self-selection problem.

The key problem is that in regressing *CARs* on the foreign cash of those banks that disclose CbCR, I don't consider the entire sample of banks and I may exclude some factors as well as include others for which results will tend to be biased (sample selection bias).

In response to the self-selection problem, I estimate the two equation model used to measure the "treatment effects".

Table 6 presents the two equations and the results obtained through the Heckman test. The first model is a choice model ("are you in the group or not?"), where the dependent variable is *Disclosure*, such as a dummy variable equal to 1 if a bank discloses CbCR and 0 otherwise.

The second model presents as dependent variable the cumulative abnormal returns (*CARs*). Including the inverse Mills ratio (0.103) obtained from the probit model, the consistency of the results is confirmed.

2.6 Conclusions

European Union has introduced in 2013 a new regulation obliging all the European financial institutions to disclose the CbCR document. The CbCR mandatory disclosure has taken effect for the first time in 2014 and makes available new key business information about the European banks, specifically the

amount of foreign cash held in other countries different from the "home" country.

Thanks to the adoption of this new regulation investors know where banks operate abroad with their foreign subsidiaries and the amount of foreign cash held by the banks themselves. Cash has the feature to be unconditional and flexible. As suggested by prior studies foreign cash specifically becomes a crucial source to satisfy managerial needs as well as to reduce tax payments in specific foreign countries. Because cash represents an essential element for the economic soundness and financial stability of each bank, I decide to investigate more on cash holding in banks to verify first whether investors react to the announcement of this new mandatory disclosure and second to test how investors value the foreign cash holding every time they know where cash is held.

The main findings show that investors react positively to the announcement of CbCR disclosure when they know exactly the amount of domestic cash and the amount of foreign cash and where exactly the foreign cash is held abroad in European banks' subsidiaries. The new regulation implies surely a reduction of opacity in banking information environment and it adds new key business information of particular relevance from investors' point of view.

Further I test whether investors value positively foreign cash and into the details foreign cash held in banks' subsidiaries of countries classified as "tax haven". I also identify "tax haven" countries located geographically in European Union area and European Union member countries. The empirical results show a positive association between CARs and foreign cash holding, but when investors know that foreign cash is held in European banks' subsidiaries in "tax haven" countries, the association is no more positive and the same when the foreign cash is held in European "tax haven" countries.

These findings suggest interesting economic insights. Investors value positively foreign cash generally, but they consider it a sort of trap every time it is held in "tax haven" countries for the presence of costs in terms of repatriation tax. Furthermore they perceive that foreign cash held in "tax havens" is a source to satisfy managerial interests and to hide investment opportunities. They perceive that foreign cash is out of banks' control and even though liquidity is always welcome, foreign cash in "tax haven" assumes

negative connotations also in terms of reputation for the banks themselves.

This study attempts to contribute highlighting how investors react to the new CbCR mandatory disclosure for all the European financial institutions and to show how they value foreign cash when they know where it is exactly held. According to the prior literature CbCR mandatory disclosure becomes an important statement on which to develop further tax considerations. Concluding, this paper speaks to changes in disclosure, and specifically increased disclosure about the geographical distribution of foreign cash holding for the European banks suggesting future considerations about the role of public scrutiny and the further regulatory implementations by policy makers.

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2.8 Appendix I - Variable Description and Measurement

Name	Description
Tot Cash	Total Cash scaled by Total Assets
Foreign Cash_TA	Total Foreign Cash scaled by Total Assets
Tax Haven ForeignCash	Foreign Cash in Tax Heaven Countries scaled by Total Cash
No Tax Haven ForeignCash	Foreign Cash not in Tax Heaven Countries scaled by total Cash
EC Tax Haven Foreign Cash	Foreign Cash in European Tax Heaven Countries scaled by Total Cash
No EC Tax Haven Foreign Cash	Foreign Cash in Tax Heaven Countries extra Europe scaled by Total Cash
ROE	The percentage of Return on Equity
Leverage	The percentage of Total Liabilities to Total Assets
Size	The logarithm of Total Assets
Tax Rate	The percentage of taxes to pre-tax profit
Dividend	Dummy variable (1=dividend payout; 0 otherwise)
Non-Earning Assets	The logarithm of Intangibles assets, fixed assets and deferred tax
Overhead	The logarithm of overhead expenses

2.9 Appendix II - List of "Tax Haven" Countries (*)

Tax Haven Country	Tax Haven in European Countries=1
Austria	1
Bahamas	0
Bahrain	0
Belgium	1
Bermuda	0
British Virginia Islands	0
Cayman Islands	0
Curacao	0
Cyprus	1
Fiji	0
Gibraltar	1
Hong Kong	0
Ireland	1
Isle of Man	1
Jersey Guernsey	0
Jordan	0
Lebanon	0
Luxembourg	1
Macau	0
Maldives	0
Malta	1
Mauritius	0
Monaco	1
Netherlands	1
Panama	0
Saint Marten	0
Seychelles	0
Singapore	0
Switzerland	1
Vanuatu	0

(*) Source: Opening the vaults: the use of tax havens by Europe's biggest banks" Oxfam
https://www.oxfam.org/sites/www.oxfam.org/files/bp-opening-vaults-banks-tax-havens-270317-en.pdf

2.10 Tables

Table 1. Summary Statistics

Panel A: EU Banks *with CbCR*	N	Mean	Median	sd	p25	p75	Skewness	Kurtosis
CAR (0, 1)	62	0.040	.0040	.096	-0.219	.067	1.087	3.601
Tot Assets (mln)	62	3.888	1.118	5.640	2.450	5.900	1.715	4.928
Tot Cash (mln)	62	0.047	0.027	0.070	0.009	0.054	3.651	18.489
Foreign Cash (mln)	62	5.735	6.347	3.287	2.833	8.346	-0.343	2.071
ROE %	62	3.840	6.040	17.120	1.310	11.910	-2.850	16.380
Leverage %	62	6.960	6.580	2.960	4.850	8.200	1.260	4.990
Size (log Tot Ass)	62	18.340	18.580	2.070	17.010	20.19	-.359	2.135

Panel B: EU Banks *NO CbCR*	N	Mean	Median	sd	p25	p75	Skewness	Kurtosis
CAR (0, 1)	121	0.054	0.099	0.226	-0.007	0.240	-1.160	3.300
Tot Assets (mln)	121	1.040	1.624	3.550	0.391	5.263	7.379	64.542
Tot Cash (mln)	121	0.733	0.047	0.086	0.129	0.107	3.466	22.203
ROE %	121	-2.936	6.774	65.412	-0.025	11.044	-8.246	75.905
Leverage %	121	31.690	12.77	33.50	7.76	44.62	1.040	2.400
Size (log Tot Ass)	121	14.290	14.30	1.930	12.87	15.47	0.120	2.856

Table 2. Correlation Matrix

	Panel A: EU Banks with CbCR	1	2	3	4	5	6	7
1	CAR (0, 1)	1.000						
2	Tot Assets	-0.278	1.000					
3	Tot Cash	0.345*	-0.029	1.000				
4	Foreign Cash_TA %	-0.042	-0.010	-0.081	1.000			
5	ROE %	0.172	-0.029	0.013	-0.613*	1.000		
6	Leverage %	0.292	-0.342*	0.363*	-0.125	0.171	1.000	
7	Size	-0.678*	0.765*	-0.140	0.089	-0.164	-0.514*	1.000

	Panel B: EU Banks NO CbCR	1	2	3	4	5	6
1	CAR (0, 1)	1.000					
2	Tot Assets	-0.001	1.000				
3	Tot Cash	-0.239*	-0.125	1.000			
4	ROE %	0.160	0.020	-0.130	1.000		
5	Leverage %	-0.276*	-0.179	0.032	0.159	1.000	
6	Size	0.555*	0.535*	-0.269*	0.158	-0.375*	1.000

(*) significance at 0.10

Table 3. Multivariate Analyses for the Sample with ALL EU BANKS

Independent Variables	1 CAR (0, 1)	P-value	2 CAR (0, 1)	P-value	3 CAR (0, 1)	P-value
TotCash_TA	-0.626	**0.002**	-0.438	**0.017**	-0.408	**0.028**
Disclosure	-0.081	**0.007**	-0.190	**0.000**	-0.225	**0.012**
Disclosure*TotCash_TA	1.100	**0.000**	1.012	**0.000**	0.935	**0.001**
ROE			0.0005	**0.000**	0.0004	**0.006**
Leverage			-0.001	**0.034**	-0.006	**0.015**
Size			0.018	**0.038**	0.269	0.094
Intercept	0.100	**0.000**	-0.130	0.362	-0.247	0.285
Country FE	*No*		*No*		*Yes*	
Nr. EU Banks	183		183		183	
Adjusted R-sq	0.063		0.1892		0.1848	
Prob > F	**0.000**		**0.000**		**0.000**	

Table 4. Multivariate Analysis on the Subsample of BANKS WITH CbCR

	1		*2*		*3*		*4*	
	CAR (0, 1)	**P-value**	**CAR (0, 1)**	**P-value**	**CAR (0, 1)**	**P-value**	**CAR (0, 1)**	**P-value**
Independent Variables								
ForeignCash_TA	0.008	**0.05**	0.101	**0.001**				
Tax Haven ForeignCash					-0.0008	**0.007**	-0.0001	**0.000**
No Tax Haven ForeignCash					0.0003	**0.003**	0.0003	**0.001**
TotCash_TA	0.402	**0.002**	0.131	0.276	0.425	**0.003**	0.1356	0.308
ROE	0.0005	0.148	-0.0004	0.888	0.001	0.105	0.0002	0.400
Leverage	-0.007	0.184	-0.001	0.888	-0.006	0.265	.0040	0.941
Size	-0.036	**0.000**	-0.035	**0.000**	-0.361	**0.000**	-0.033	**0.000**
Intercept	0.849	**0.000**	0.815	**0.000**	0.72	**0.000**	0.647	**0.000**
Country FE	*No*		*Yes*		*No*		*Yes*	
Nr. Obs	62		62		62		62	
Prob > F	**0.000**		**0.000**		**0.000**		**0.000**	
R-squared	0.585		0.532		0.596		0.538	

Table 5. Multivariate Analysis on the Subsample of BANKS WITH CbCR and Tax Havens in European Countries

Independent Variables	1 CAR (0, 1)	P-value	2 CAR (0, 1)	P-value	3 CAR (0, 1)	P-value	4 CAR (0, 1)	P-value
EC Tax Haven Foreign Cash	-0.0009	**0.003**	-0.0001	**0.000**	-0.0004	0.41	-0.0008	**0.000**
No EC Tax Haven Foreign Cash	-0.0007	**0.044**	-0.001	**0.024**	0.001	**0.005**	0.001	0.043
TotCash_TA	0.442	**0.001**	0.416	**0.00**	0.406	**0.002**	0.142	0.297
ROE					0.001	0.749	-0.0008	0.057
Leverage					-0.007	0.244	.001	0.864
Size					-0.038	**0.000**	-0.036	**0.000**
Intercept	0.305	0.077	0.034	**0.000**	0.762	**0.000**	0.693	**0.000**

Country FE	*No*		*Yes*		*No*		*Yes*	
Nr. Obs	62		62		62		62	
Prob > F	**0.000**		**0.000**		**0.000**		**0.000**	
R-squared	0.1727		0.1695		0.592		0.5245	

Table 6. Test di Heckman (Selection Bias)

Wald chi(2)	16.07		Nr. Obs	183	
Prob>chi 2	**0.006**		Censored obs	121	
			Uncensored obs	62	

CAR	*Coeff.*	*P> z*	*Select*	*Coeff.*	*P> z*
ForeignCash_TA	0.011	**0.038**	*Disclosure*		
TotCash_TA	0.392	**0.032**	Tax Rate	0.235	0.216
ROE	0.001	0.144	Dividend	1.298	0.058
Leverage	-0.009	0.051	Non-Earning Assets	-0.263	0.285
Size	-0.020	0.093	Overhead	0.732	**0.016**
Intercept	0.546	**0.030**	TotCash_TA	3.202	0.234
			ROE	0.008	0.397
Inv. Mills ratio	0.103	**0.036**	Leverage	-0.135	**0.026**
rho	1.000		Size	0.162	0.579
sigma	0.103		Intercept	-8.80	**0.000**