Determinants of Bank Liquidity Creation: regulatory and supervisory policies, quality of governance and legal origins[☆]

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Abstract

Despite significant interest in the global regulatory frameworks, there is no empirical work on the role of strengthening supervisory power and private sector monitoring in influencing the ability of banks to create liquidity. This paper examines how these two supervisory systems affect bank liquidity creation. In addition, this paper investigates whether the quality of nationwide governance enhances or impedes bank liquidity creation. Using the measure of the quality of governance and four recent worldwide surveys on bank regulation and based on a sample of publicly traded commercial banks in the 27 EU countries over 1996-2013, I find that a strengthening of official supervisory power impedes the ability of banks to create liquidity only in countries with higher quality of governance. However, the evidence indicates that private sector monitoring of banks is positively associated with bank liquidity creation in countries with higher quality of country-level governance. Further analysis reveals that legal origins also matter for the provision of liquidity by banks. I use an instrumental variable approach to deal with possible endogeneity concerns regarding the regulatory frameworks. Overall, the results provide an important insight into the determinants of bank liquidity creation, and the design of regulatory and supervisory practices.

JEL classification: G20, G21, G28, K2
Keywords: liquidity creation; governance; bank regulation; supervision; legal origins

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1. Introduction

Financial regulation, and supervision schemes have been a highly controversial issue among policymakers and scholars in the past few years. Even though a growing literature examines how bank regulatory and supervisory frameworks affect bank efficiency, performance, development and stability, [1] there are little studies on the assessment of the types of regulatory and supervisory policies that influence bank liquidity creation. The existing literature on the relationship between bank liquidity creation and different types of regulatory and supervisory policies is rather limited to bank regulatory capital (see e.g. Berger and Bouwman, 2009; Fungacova, Weill, Zhou, 2017; Distinguin, Roulet, and Tarazi, 2013).[2] Hence, one of the purposes of this paper is to provide a comprehensive empirical analysis of this important issue.

The focus on bank liquidity creation is reinforced by the fact that liquidity transformation is a preeminent economic function of banks that supports the macroeconomy. Banks traditionally provide liquidity by funding long-term illiquid assets with short-term liquid liabilities. However, the process of liquidity creation reduces the liquidity of banks and exposes them to different types of risks, liquidity crunches, and bank runs (Diamond and Dybvig, 1983; Kashyap, Rajan and Stein 2002; Berger and Bouwman, 2009). [3]

Regulatory and supervisory authorities play an important role in governing, monitoring and implementation of effective and sound practices in the banking system. Good regulatory governance potentially helps to enhance the stability of the financial system by providing system-wide effective practices. To achieve this goal, the regulatory and supervisory authorities themselves need to operate and establish sound regulatory practices. However, supervisory authorities and private investors are influenced by the quality of nationwide governance. Hence, sound and effective regulatory governance cannot be achieved without good public sector

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[1] See e.g. Barth et al. (2013), Chortareas et al. (2012), Beck et al. (2006), Barth et al. (2006), Barth et al. (2004).

[2] I acknowledge the contribution of Berger et al. (2016) which examines the impact of regulatory interventions and capital bailout on bank liquidity creation. However, it only focuses on all the actions taken by authorities in Germany which are more related to restrictions on banking activities and disciplinary actions such as restrictions and prohibitions of lending, deposit taking activities, and profit distributions, instructions to the bank's management, limitations on the scope of managerial decisions, appointment of a trustee, hearing about dismissal of executives, actual dismissal of executives, official disapprovals, fines for the institutions and executives, warnings of executives and threats of measures according to the Banking Act. It also does not consider the dynamics between key regulatory, supervisory policies, private monitoring, quality of cross-country governance and the ability of banks to create liquidity.

[3] In the aftermath of global financial crisis, the Basel Committee on Banking Supervision documented "that many banks had failed to take account of a number of basic principles of liquidity risk management when liquidity was plentiful" (Bank for International Settlements, 2008).

governance. Therefore, the quality of country-level governance is a precondition for good regulatory schemes. Das, Quintyn, and Chenard (2004) find that good public sector governance enhances the impact of regulatory practices on financial system stability. Also, previous studies find evidence that empowering supervisory authorities tend to increase the corruption of bank officials (see e.g. Beck et al., 2006; Barth et al., 2004). Empowering supervisory authorities in countries with lower level of quality of governance might increase corruption in lending and distort the allocation of bank funds. Hence, powerful official supervisory agencies may only focus on their own benefits rather than promoting social welfare. Despite the importance, very little is known about the impact of good quality of governance on the ability of banks to create liquidity. This is another empirical question that I explore in this study. I also examine the impact of the quality of governance on the relationship between bank regulation, supervision and liquidity creation.

According to law and finance theory, historical background and the legal system can help to develop regulations and policies that are more constructive for financial markets. Hence, it would be unconceivable to think about a financial system without a legal system to support it. Previous studies show that differences in legal environments across countries are one of the fundamental determinants of financial and capital market development (see e.g. La Porta et al., 1997; 1999; Beck et al., 2003b). A number of studies also show that countries that adopt French law traditions have less developed financial system than countries with English law traditions. Thus, another purpose of this paper is to provide the first cross-country empirical analysis of whether legal origins can impact the level of bank liquidity creation as the main function of banks.

Answer to all these questions is an important aspect of a well-functioning financial system, and helps policymakers not only to understand the determinants of bank liquidity creation, but also to make informed decisions about the regulations of banking system. However, due to limited data availability on the measures of quality of governance, bank regulation, supervision and private monitoring, a comprehensive study on how key regulatory and supervisory policies, and the quality of governance affect the ability of banks to create liquidity does not yet exist.

The data limitation on the quality of governance has been addressed by using the World Governance Indicator (WGI) complied by Kaufmann et al. (2006). Also, the data on bank regulation, supervision and private monitoring come from four surveys conducted by Barth et al. (2004, 2006, 2008, 2013). Overall, the WGI and four surveys provide a detailed and

comprehensive picture of differences in the quality of governance and bank regulation and supervision in various countries. Therefore, the data provide an excellent opportunity to examine the impact of regulatory and governance environment on bank liquidity creation. In addition to these two datasets, I also use the data on legal origins from La Porta et al. (1999).

To deal with the causal effect between supervisory actions and bank liquidity creation, I use instrumental variable (IV) analysis. A potential endogeneity problem could exist due to reverse causality. For example, being high liquidity creators may expose banks to higher liquidity risk as they are more illiquid compared to those banks that create the least liquidity creation in the economy. Thus, bank liquidity creation may influence the regulatory and supervisory framework in the direction of being more resilient and accommodative to liquidity management. Therefore, regulatory policies might be endogenous to the structure of banking sector. However, it is unlikely that the level of liquidity creation for individual banks influences quality of nationwide governance or country's historical legal system. In such cases, I perform OLS regression with country and year dummies when investigating the association between legal origins, quality of governance and bank liquidity creation.

I select the instrumental variables for supervisory actions based on law and finance literature. According to the existing literature on law and finance, years of independence since 1776 and ethnic fractionalization are important factors in developing the country's financial system. It is highly unlikely that these factors would have a direct impact on bank liquidity creation. However, these variables may influence bank liquidity creation through their impact on bank regulation and supervision. To allay potential causality problems, I require a valid instrument that are correlated with my regulatory policies but uncorrelated with the error term. As part of my analysis, I show that the instruments used are relevant and strong for my analysis.

Using data for 220 publicly traded commercial banks in Europe over the period 1996-2013, I obtain the following main results. First, strengthening official supervisory power, and the quality of country-level governance can impede the ability of banks to create liquidity. The findings complement Agoraki et al (2011) documenting that powerful supervisory authorities reduce bank risk-taking behavior. My work also extends the previous findings of Berger et al. (2016), who find that bank regulatory intervention taken place in Germany decrease the level of bank liquidity creation. Second, I find that there is a strong interaction and negative effect of official supervisory power and the quality of governance on bank liquidity creation. However, encouraging private

sector monitoring enhance bank liquidity creation only in countries with better quality of governance. These findings are important as they may suggest that the quality of public sector might be important to reduce bank risk-taking behavior and impede liquidity risk in the banking sector which may lead to financial system stability. Third, I find that banks in countries that adopt English laws create higher level of liquidity than banks in countries with French, German or Scandinavian traditions. The result is consistent with previous finding in the finance and law literature documenting that countries that inherited the English law tradition support financial development to a greater degree than countries that adopted French law traditions.

To better understand the driving force behind the findings, I also decompose bank liquidity creation into its two main components, namely asset-side and liability-side liquidity creation. I show that the quality of governance and powerful supervisory agencies reduce liquidity creation on the asset side, but do not affect liquidity creation on the liability side. However, private sector monitoring increase liquidity creation on the asset side. Further analyses reveal that powerful supervisory authorities lower bank liquidity creation only for large banks.

Overall, my findings in this paper not only enrich our understanding of the effect of better-governed countries, supervisory enforcement and legal environment on the ability of bank liquidity creation but also provide an insight into the design of bank regulation and supervision schemes in different countries with different legal system. The results show that there are potential tradeoffs between bank liquidity creation and bank soundness. While the main goal of regulatory and supervisory practices is to reduce banks' risk-taking behavior and promote financial system stability, these regulatory schemes might have an unintended impact on bank liquidity creation which may have adverse repercussions for macroeconomy.

The rest of the paper is organized as follow. Section 2 provides the relevant literature discussion. Section 3 presents the data sources. It also discusses the measures of bank liquidity creation, regulatory policies, quality of governance and legal origins. Section 4 presents the methodology and the empirical results, and section 5 concludes the paper.

2. The relevant literature review

This section provides a relevant review of the literature that relates bank regulation, supervision policies, quality of governance and legal origins with bank liquidity creation.

2.1. Bank regulatory and supervision policies

There is little known on the relationship between bank regulation, and supervisory policies on bank liquidity creation. One theoretical study shows that the regulator's policy influences the risk-taking behavior of banks (Mailath and Mester, 1994). An empirical study by Agoraki et al. (2011) finds that official supervisory power reduces bank risk-taking behaviors. Delis et al. (2013) also document that supervisory actions for effective internal control and risk management improve bank soundness. Using a dummy variable for one or more interventions by regulators in Germany (such as: activity restrictions, pay fines, dismissal of executives, and change process), Berger et al. (2016) recently find that regulatory interventions reduce bank liquidity creation. However, none of these studies provide evidence on the effect of official supervisory power, and private monitoring on bank liquidity creation.

No consensus exists on whether official supervision has advantage over the private sector in monitoring banks. As discussed in Barth et al. (2006, 2004), according to "supervisory power view" powerful supervisory authorities can act in the best interests of society and maximize society's welfare. In such a situation, they directly discipline and monitor non-compliant banks and can reduce market failure and overcome market imperfections. Thus, supervisor with ample powers can help prevent banks from engraining in excessive risk-taking behavior and thereby bank liquidity creation may decline as well, leading to a reduction in bank illiquidity, and their exposure to liquidity risk. In this regard, I conjecture a negative association between supervisory power and bank liquidity creation. In contrast, according to "regulatory capture view" powerful supervisory authorities may abuse their power and exert their own private benefits rather than social welfare maximization (Shleifer and Vishny, 1998; Djankov, et. al., 2002; Barth et al., 2004, 2006). Beck et. al. (2006) find that official supervisors with ample powers may reduce bank lending integrity which may have an adverse impact on the efficiency of credit allocation. In such a situation, powerful supervisory authorities may force banks to allocate credits to exert political or private benefits. Hence, official supervisory power may have a positive effect on bank liquidity creation.

According to "private empowerment view", supervisory authorities may not have incentive to ease market failure because regulators and supervisors do not have an ownership stake in the banks, and thereby they have different incentives than private creditors for monitoring and disciplining banks. Therefore, facilitating and encouraging private monitoring and market discipline may promote better functioning banking system. Barth et al. (2004) find that official

supervisory power is not associated with bank development and performance. However, they find that private monitoring boost bank performance and bank development. Therefore, they suggest that countries benefit from facilitating private monitoring rather than empowering official authorities. Corruption in bank lending might be smaller in countries that facilitate public information disclosure than in countries with empowered supervisory authorities. In addition, private sector may monitor banks better than supervisory agencies and limit bank risk taking because of their ownership stake. From this perspective, I expect a negative association between private monitoring and bank liquidity creation. However, private monitoring might be difficult in a complex and opaque banking sector which might have an opposite effect on bank liquidity creation.

2.2. Quality of governance

Market-based monitoring and official government supervision are affected by the quality of government monitoring activities. Thus, good quality of country-level governance helps the official government supervisors and private sector monitoring implement sound and effective practices in the banking sector. Thereby, quality of governance plays a vital role in the formation of a well-functioning financial system.[4] Despite the importance, to best of my knowledge there is no studies to investigate the relationship between quality of cross-country governance and bank liquidity creation.[5] In addition, I explore the interplay effect between quality of governance and bank regulatory and supervisory practices to assess whether quality of governance make better use of private monitoring and supervisory power in enhancing or impeding the ability of banks to provide liquidity.

Das et al. (2004) document that better public sector governance enhances the impact of regulatory governance on financial system stability. Since the goal of good regulatory practices in a good government is to reduce bank risk-taking behavior and limit liquidity risk, I expect that good quality of governance is negatively associated with bank liquidity creation. On the contrary, the important role of good governance in promoting economic growth is well-established in

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[4] Previous papers show that quality of country-level governance is one of the determinants of social and economic development (see e.g. Busse and Gröning, 2009; Kray and Tawara, 2010).

[5] There are few studies which only examine the association between bank corporate governance and bank liquidity creation. For example, Diaz and Huang (2017) examine the effect of internal bank governance on liquidity creation and they find that banks with better shareholder protection create a higher level of liquidity creation compared to poorly-governed banks.

empirical studies.[6] Therefore, I conjecture that countries with good governance-related issues (i.e. uncorrupted and benign government, a stable political environment, a legal system that protect political and property rights and enforce modest regulations) provide an environment for banking system to operate efficiently and thereby enhance the performance of the economy. Hence, good quality of governance may increase bank liquidity creation in order to support macroeconomy and enhance economic development.

2.3. Legal origins

Previous literature links legal system to financial and economic developments (see e.g. La Porta et al.,1997; Levine, 1998; La Porta et al., 1999; Beck et al., 2003b). For example, a number of studies find that differences in legal system explain the cross-country variation in financial development (La Porta et al., 1997; 1999; Levine et al., 2000; Beck et al., 2003b). According to law and finance literature, French law countries have more rigid legal environment and therefore they support financial development less effectively. Levine (1998) shows that countries with stronger creditor rights and with rigorously enforcement of laws and contracts have better-developed banking sector. However, little is known about the relationship between legal origins and bank liquidity creation as a core function of banks that supports the macroeconomy. I provide the first empirical analysis of whether difference in legal systems affects the ability of banks to create liquidity. As documented by La Porta et al. (1998) English law countries have stronger creditor rights than French, German, and Scandinavian countries. In addition, La Porta, et al. (1997), and Beck et al. (2003b) document that British law countries tend to have higher levels of financial development and better-developed capital markets than French law countries. Therefore, I expect that banks in French, German and Scandinavian law countries create lower level of liquidity compared to Banks in English law countries.

3. Data

My sample includes publicly traded commercial banks in Europe over the 1996-2013 period. The dataset used in this study is an intersection of the available data from the Bloomberg database and Barth et al. (2004, 2006, 2008, 2013) datasets on bank regulation, supervision and monitoring from the World Bank's Bank Regulation and Supervision Survey. These surveys were conducted in 1999, 2003, 2007, and 2011. Since these surveys are available at only four points in time, I use

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[6] See e.g. DeLong and Shleifer, 1993; Knack and Keefer, 1995; Mauro, 1995; Easterly and Levine, 1997.

the previously available survey data until the new one becomes available. In particular, I use the survey data of 1999 during the period 1996-2002, the survey data of 2003 for the years 2003-2006, survey data of 2007 for the years 2007-2010, and survey data of 2011 for years 2011-2013. In this study, I use private sector monitoring index and official supervisory power index from the surveys. The Bloomberg database provides the standardized and detailed balance sheet and income statement data. The standardized datasets ensure the accurate representativeness of the sample of banks in each country and extensively and frequently report the detailed balance sheet information for listed banks. Due to unavailable information on private or unlisted banks, I only include listed banks in this study. To compute the liquidity creation measures, I only include banks for which the breakdown of loan based on loan category and the breakdown of deposits based on their maturity are available in Bloomberg. From 1996 to 2013, I identify 220 listed commercial banks in 27 European countries. Table 1 reports the distribution of banks by country. In addition to these two datasets, I use the World Governance Indicator (WGI) complied by Kaufmann et al. (2006) to obtain the quality of nationwide governance.

[Table 1]

I match the bank-level data with the bank regulatory and supervisory measures, and quality of governance to explore the linkage between bank regulation, supervision, private monitoring and quality of governance with bank liquidity creation.

In addition to these datasets mentioned above, I rely on other data sources in this study. Specifically, I use the World Development Indicator (WDI) database to obtain economic development variables. To obtain the cross-country private credit, I use the Financial Structure Dataset (Beck et al., 2010). In addition, to compute bank specific variables, I collect all necessary data on either balance sheets or income statements from Bloomberg database. Also, I obtain the data on legal origins and latitude from La Porta et al. (1999), and the data on years of dependence since 1776 are obtained from Beck et al. (2003b). Finally, I use the data on Ethnic Fractionalization from Easterly and Levine (1997). Table 2 provides the brief description of all the variables, and data sources used in this study.

[Table 2]

3.1. Measure of bank liquidity creation

For a long time, liquidity creation was only a theoretical concept,[7] and thus it received little attention in prior empirical research. In 2009, Berger and Bouwman developed a comprehensive measure of bank output which is consistent with the financial intermediation theory. In this study, I use two of Berger and Bouwman's (2009) measures of bank liquidity creation. I only measure on-balance sheet liquidity created by banks or their exposure to liquidity risk because a detailed breakdown of off-balance sheets is not available in the Bloomberg database. Specifically, I use the measure of liquidity creation which incorporates all bank on-balance sheet information.

To compute the liquidity creation measure, all assets and liabilities are classified as liquid, illiquid and semiliquid following Berger and Bouwman (2009). In the second step, different theoretically-driven weights are assigned to each item. To summarize briefly, positive weights are given to illiquid assets, and liquid liabilities, and negative weight are given to liquid assets, illiquid liabilities and equity. Positive weights are consistent with the theoretical notion that by creation liquidity banks actually take something illiquid from the public and in turn give the public something liquid. Negative weights are also in line with the theoretical notion that banks can destroy liquidity by financing liquid assets with illiquid liabilities or equity. In the third step, the weighted sum of all on-balance sheet items is calculated. I follow Distinguin's et al. (2013) methodology to compute bank liquidity creation. Table 3 shows the balance sheet items and the corresponding weights for calculating bank liquidity creation based on Distinguin et al. (2013).[8] Following Berger and Bouwman (2009), the measure of liquidity creation is normalized by total assets to improve comparability to avoid giving unnecessary weights to the largest banks.[9]

[Table 3]

All else being equal, banks can destroy liquidity by financing liquid assets with illiquid liabilities or equity, and banks can create liquidity on their balance sheets by financing relatively illiquid assets such as long-term loans with relatively liquid liabilities such as demand deposits

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[7] For example, see e.g. Diamond and Dybvig, 1983; Holmstrom and Tirole, 1998; and Kashyap, Rajan, and Stein, 2002.

[8] Distinguin, Roulet and Tarazi (2013) also use the on-balance sheet information in Bloomberg to compute bank liquidity creation.

[9] The results are pretty robust using the alternative measures. First, in an unreported analysis, I exclude equity from the measurement of bank liquidity creation (LC_EE) following Berger and Bouwman (2009). This measure does not penalize banks for funding part of their capital through equity. Second, I use the change in liquidity creation scaled by bank total assets ($\frac{\Delta LC}{TA}$).

(Bryant, 1980; Diamond and Dybvig, 1983). Therefore, higher values of liquidity creation indicate higher bank illiquidity, because banks get more exposed to maturity transformation risk.

In further analyses, I decompose on-balance sheet liquidity creation into asset-side and liability-side liquidity creation in order to understand the driving force behind the results. In addition, since large and small banks have different business model and scope of activities, I investigate the impact of bank size on the observed relationships.

3.2. Bank regulatory variables

I consider the following two bank regulation and supervision variables in this study. First, I use the Official Supervisory Power Index (OSPI) which is a measure of the strength of bank supervision, indicating whether the supervisory authorities have the authority to take specific actions to overcome market failures and prevent and correct problems. This index rages from 0 to 14, with a higher value indicating higher power of supervisory authorities. Second, I use Private Monitoring Index (PMI) to measure to degree to which regulatory and supervisory practices require accurate and reliable information disclosure. PMI focuses on the strengthening the incentive and ability of private investors to exert effective monitoring and governance over banks and it ranges from 0 to 12, with higher values indicating greater private monitoring.

3.2.1. Instruments

As mentioned before, I choose the instrumental variables (IVs) from law and finance literature ((see e.g. Beck et al., 2003a; Beck et al., 2003b; Barth et al., 2009; Barth et. al., 2013). These IVs are widely used to allay potential endogeneity concerns arisen from reverse causality in the bank regulation studies. Specifically, ethnic fractionalization, and the percentage of years that the country has been independence since 1776 are potential determinants of financial system development. It is argued that these variables play a crucial role in shaping policies and regulations to promote financial developments (Beck et al. 2003a; Beck et al., 2003b; La Porta et al. 1999; Easterly and Levine, 1997). These variables are unlikely to have a direct effect on bank liquidity. However, these factors might influence bank liquidity through their effect on bank regulations.

Years of independence is the percentage of years that the country has been independence since 1776 normalized to lie between zero and one. A longer period of country's independence may help to develop regulations and policies that are more constructive for financial markets.

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Ethnic fractionalization is the probability that two randomly chosen persons from the country are from two different groups. A highly ethnically diverse economy may provide adaptation of policies and regulations that may restrict open and competitive financial system.

To alleviate the potential endogeneity concerns, I require a valid instrument that is correlated with my bank liquidity creation measures but not correlated with the error term. It is also crucial that my instruments are strong. Following the literature, I conduct the standard first stage F-test of excluded instruments to see whether the instruments are relevant. I also report the Sanderson-Windmeijer (SW) multivariate F-test for each of the endogenous regressors which tests whether each of endogenous regressors is weakly identified.[10]

3.3. Quality of governance

To measures the quality of governance, I use the World Governance Indicator (WGI) complied by Kaufmann et al. (2006) which is based on six different dimensions of governance, including Voice and accountability, Government effectiveness, Regulatory quality, Political stability, Rule of law, and Control of Corruption. The indexes are covered for more than 200 countries constructed from 35 data sources provided by more than 30 different organizations. In this study, the WGI is constructed using first principle components indicator of the six governance dimensions, with higher values indicating higher quality of governance. I treat the quality of governance as an exogenous variable since it seems unlikely that an individual level of bank liquidity creation influences nationwide quality of governance. [11] To investigate the association between quality of governance and bank liquidity creation, I employ OLS regression with country and year dummies and heteroscedasticity robust standard errors.

3.4. Legal origins

I use La Porta et al. (1999) indicators specifying whether the country has English laws, French civil laws, German civil laws, and Scandinavian laws. Specifically, I include a dummy variable for each country's legal origins. I consider the legal origins as exogenous variables, because legal traditions are based on historical background, and these traditions would help to

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[10] In case of a single endogenous regressor, the first stage F-test of excluded instrument is identical to SW multivariate F-test.

[11] The results continue to hold when using the IV approach for the quality of governance.

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develop regulations and policies that are more constructive for financial markets. Therefore, legal origins have an important role in shaping the financial development today, and it is unlikely that legal systems would be endogenous in the regression. In other words, bank liquidity creation cannot affect the origination of the legal system. To investigate the association between legal origins and bank liquidity creation, I employ OLS regression with country and year dummies and heteroscedasticity robust standard errors.

3.5. Control variables

I include three key bank-specific variables: bank riskiness, measured by the ratio of loan loss provisions to total loans (LLP_TL); size, measured as a natural logarithm of bank's total assets (LnTA); and bank profitability, measured by the ratio of net income to total equity (ROE).

Bank market power influences the funds availability in the banks and it also affects the distribution of bank's loan portfolios (see e.g. Petersen and Rajan, 1995; Berger et al., 2005). Hence, Banks with greater market power are able to increase their transformation activities by attracting more funds and making more loans. Therefore, I include control for bank market power by the ratio of total assets of bank *i* in country *j* to the total assets of the banking sector in that country (MKT_PWR). I expect a positive sign on the coefficient of this variable.

I control for various macroeconomic variables. First, I control for macroeconomic environment by including the natural logarithm of GDP (LnGDP) to measure the country's economic development. Second, I control for global integration by the ratio of imports plus exports of good and services to GDP (Karolyi et al., 2012). Third, I control for banking sector development by the ratio of private credit to GDP.

I also create a dummy variable that indicates whether banks operate in one of the five largest EU banking sectors. 5EU is a binary variable which takes a value of 1 for the 5 largest banking sector in Europe (i.e. Germany, UK, Italy, France, and Spain) and zero otherwise.

Table 4 reports the summary statistics of all variables used in this study.

[Table 4]

4. Methodology and empirical results

4.1. IV regressions

To assess the relationship between bank regulation, and supervision policies on bank liquidity creation, I perform 2SLS regression with the following specification:

$$L_{ijt} = \alpha + \beta_1 RSP_{jt} + \beta_2 BankControls_{ijt} + \beta_3 MacroEconomicVariables_{jt} + 5EU + \gamma_t + \varepsilon_{ijt} \quad (1)$$

where i refers to bank i, j indexes country j, t denotes period. The dependent variable is alternatively one of the followings: on-balance liquidity creation scaled by total assets at bank i in country j in year t (LC), or one of its components (i.e. asset-side or liability-side liquidity creation).[12] RSP_{jt} is the potential endogenous explanatory variables: official supervisory power (OSPI), and private monitoring (PMI). Bank-level control variables are bank profitability (ROE), bank size (LnTA), bank market power (MTK_PWR), and riskiness of bank assets (LLP_TL). Macroeconomic variables include the country economic development (LnGDP), global integration, and banking sector development (Private Credit/GDP). 5EU is a dummy variable which take a value of 1 if banks operate in one of the five largest banking sectors in the EU and zero otherwise. I also estimate modified versions of Eq.1 in which I include an interaction variable $RP \times QG$ to examine the interplay effect of quality of governance and supervisory power, and private monitoring on bank liquidity creation.[13]

First-stage estimates are obtained by regressing RSP on the instrumental variable and other explanatory variables. In the second stage, I regress my liquidity creation measures on the fitted values of the potentially endogenous variables, other controls, and year dummies. I cannot include bank or country dummies due to time-invariant nature of the instrumental variables.

In further analyses, I re-estimate the baseline model specified by Eq.1 for large and small banks. Following the banking literature, banks with total assets exceeding \$1 billion are considered as large banks, and banks with total assets of up to \$1 billion are considered small banks. I also examine long-run effects of bank regulatory policies on bank liquidity creation.

4.2. Model specification for quality of governance and legal origins

To examine the effect of the quality of governance and legal origins on bank liquidity creation, I use the following OLS regression setup:

$$L_{ijt} = \alpha + \beta_1 S_{jt} + \beta_2 BankControls_{ijt} + \beta_3 MacroEconomicVariables_{jt} + \theta_j + \gamma_t + \varepsilon_{ijt} \quad (2)$$

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[12] In an unreported test, I also use an alternative measure of bank liquidity creation. Following Berger and Bouwman (2009), I compute liquidity creation excluding equity scaled by total assets at bank i in country j in year t (LC_EE). The results continue to hold using this alternative measure.

[13] The results do not change when standard errors are clustered at the year and country level.

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where i refers to bank i, j indexes country j, t denotes period. S_{jt} is alternatively one of the followings: quality of governance (QG) or legal origins (i.e. English law, French law, German law, and Scandinavian law). θ_j is country dummies, and γ_t is year dummies.[14] ε_{ijt} is the error term.

4.3. Results

Panel A of Table 5 reports the results for the model specified by Eq.1. Columns 1-3 present regressions of bank liquidity creation measure and its two components on official supervisory power as the main regulatory variable. From column 1, I find that strengthening supervisory power is negatively associated with bank liquidity creation. This result is driven by asset-side liquidity creation. While banks that held more illiquid assets can create more liquidity, they are more exposed to liquidity risk due to liquidity mismatch. Therefore, supervisory authorities need to monitor these banks to promote their soundness and resiliency. The coefficient estimates in column 1 implies that a one-standard deviation (2.27) increase in supervisory power reduces bank liquidity creation by 4.99 ($= 0.022 \times 2.27$) percentage points. The results are consistent with the finding of Agoraki et al. (2011), documenting that official supervisory authorities reduce bank risk-taking behavior. In addition, Berger et al. (2016) finds than regulatory interventions decrease bank liquidity creation.

[Table 5]

Columns 4-6 report the regression results with the private monitoring variable. From column 4, I find that private sector monitoring increases the ability of banks to create liquidity, and this result is mainly driven by asset-side liquidity creation. Even though market-based monitoring may increase a core function of banks which support macroeconomy, the opacity and complexity of banks may make private supervision difficult, and thus private investors might not be able to correctly assess bank' behavior and materialize the potential risk. Indeed, a combination of the two supervisory systems may complement one another, promote bank soundness and maintain long-tun performance of the economy.

As for control variables, larger banks, as proxied by logarithm of total assets, create higher level of liquidity creation. I find mixed results for bank market power. I also find that global integration is positively associated with bank liquidity provision. In addition, more developed

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[14] Including bank dummies instead of country dummies produces the same results.

countries have lower level of bank liquidity creation. Svensson (2005) documents that higher GDP is negatively associated with corruption. Park (2012) finds that corruption deteriorates the quality of bank loans. Since corruption may increase the problem with risky and bad loans in the banking sector, bank liquidity may increase as well in corrupted environment. Therefore, if more developed countries are less corrupted, then it is likely that banks in such economies create lower level of liquidity.

Table 6 shows the results for the impact of banks size on the relationship between regulatory and supervisory policies and bank liquidity creation. Using a cutoff point of $1 billion in total assets, I define large and small banks. Specifically, banks with total assets exceeding $1 billion are considered as large banks, and banks with total assets of up to $1 billion are considered small banks. The results in columns 1-4 of Table 6 show that powerful official oversight of banks decrease bank liquidity creation only for large banks. However, this relationship is positive for small banks. While large banks create the most liquidity in the economy, they are more exposed to liquidity risk. Hence, such monitoring may lower their exposure to liquidity risk.

[Table 6]

Table 7 reports the results for the model specified by Eq.2. Columns 1-3 summarize the results for quality of governance as the key explanatory variable. I find that good quality of nationwide governance reduces the ability of banks to create liquidity, and this result is largely accounted for by asset-side liquidity creation. In terms of magnitudes, a one-standard deviation (2.19) increase in quality of nationwide governance induces a reduction in liquidity creation of 6.6 ($= 0.03 \times 2.19$) percentage points. Since corrupted public sector may distort the allocation of bank funds to risky projects, bank liquidity creation in such countries may increase due to misallocation of bank funds. For example, in such countries, loans can be secured by bypassing the loan review processes which may result in excessive level of liquidity creation. The control variables show similar coefficients as in previous table.

[Table 7]

Columns 4-6 of Table 7 present the results which examine the effect of legal environments on bank liquidity creation. Consistent with law and finance literature, bank liquidity creation is lower in countries that adopt French law traditions compared to English law countries. Even though changing the law and enforcement mechanisms are relatively difficult, legal reforms may

have a prominent role in improving the functioning of banking sector as they directly influence the shape of financial system.

Next, I explore the interplay effect of between quality of governance and bank regulatory and supervisory practices to assess whether quality of governance make better use of private monitoring and supervisory power in enhancing or impeding the ability of banks to provide liquidity. Table 8 reports the results. As can be seen, a strengthening of official supervisory power is negatively associated with bank liquidity creation only in countries with higher level of governance quality. Moreover, empowering private sector monitoring enhance the ability of banks to create liquidity only in countries with good public sector. Official supervisory power in a highly corrupt public sector may increase banks' exposure to liquidity risk because when banks extensively create liquidity, they make themselves illiquid. This may reduce soundness of banking sector for countries belonging to the lower level of governance quality. In addition, in countries with poor quality of governance, bank supervisors may not strictly adhere to rules. Beck et al. (2006) and Barth et al. (2009) find that empowering official supervisory authorities is positively associated with corruption in lending. Park (2012) also find that corruption deteriorates the asset quality of the banking sector, and enhance the misallocation of bank funds. Thus, the impact of the quality regulatory governance is greater when supported by sound public sector governance.

[Table 8]

Next, Table 9 reports the results which examine the effect of bank regulations on liquidity creation in the long run. For this purpose, I lag all explanatory variables by 1, 2 or 3 years, and re-estimates the IV regressions. The results show that strengthening supervisory power, and private sector monitoring have long run effect on the ability of banks to create liquidity.

[Table 9]

Finally, I re-estimate the models specified by Eq.1 and Eq.2 using the aggregate measure of bank liquidity creation for each country with macroeconomic controls. For this purpose, I construct an aggregate bank liquidity creation measure for each country for each sample year, and I convert these data to the country level. Then, I replace bank-level liquidity creation with the aggregated measure. Panel A of Table 10 shows the results which examine the effect of official supervisory and private sector monitoring on country-level bank liquidity creation, while panel B of Table 10 presents the result which examines the effect of quality of nationwide governance and legal origins

on the aggregate bank liquidity creation measure. The results continue to hold using country-level bank liquidity creation.

[Table 10]

5. Conclusion

Financial regulation, supervision schemes, and the quality of governance have been a highly controversial issue among policymakers and scholars in the past few years. Despite the importance, there are little studies on the assessment of the types of regulatory and supervisory policies and quality of governance that influence bank liquidity creation.

Using publicly traded commercial banks in 27 European countries over the period 1996-2013, I find that supervisory power is negatively associated with bank liquidity creation, whereas strengthening private sector monitoring has a positive impact on the ability of banks to create liquidity. Even though an increase in bank liquidity creation may have an important impact on the macroeconomy, it may actually cause financial system instability because liquidity creation might increase banks' exposure to liquidity risk (e.g. Allen and Gale, 2004; Allen and Santomero, 1998). Thus, a combination of the two supervisory systems may complement one another, promote bank soundness and maintain long-tun performance of the economy.

In addition, I find that boosting official supervisory power impedes bank liquidity creation only in countries with good quality of governance. The reason might be due to the fact that the main goal of good regulatory policies in a good public sector is to impede bank risk-taking behavior. This is consistent with the view that supervisors act in the best interests of society and maximize society's welfare. Exerting efforts to enhance the quality of public sector might be the first step to promote financial system stability otherwise regulatory policies may not be effective to reduce bank liquidity risk. Thus, regulatory and supervisory policies are more likely to be effective in a context of good governance even though they may actually trigger reduction in bank liquidity creation, which may have an adverse effect on the real economy. There should be an optimal point or threshold for bank liquidity creation.

Finally, I find that legal origins also matter for the provision of liquidity by banks. The finding suggests that countries with French law traditions create lower level of bank liquidity than English law countries. Although changing the legal environment is difficult, law and enforcement mechanisms influence the shape of the banking sector, and legal reforms may improve functioning of the banking sector.

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Table 1
This Table reports the distribution of European publicly traded commercial banks by country.

Country	Banks available in Bloomberg	Banks included in the final sample	Total assets of banks in final sample/total assets of the entire banking sector in the sample (%)
Austria	7	7	1.463
Belgium	6	6	6.497
Bulgaria	5	5	0.017
Croatia	12	7	0.046
Cyprus	4	4	0.163
Czech Republic	1	1	0.116
Denmark	23	22	2.025
Finland	2	2	0.044
France	18	18	20.681
Germany	8	7	11.484
Greece	11	11	1.630
Hungary	1	1	0.122
Ireland	2	2	1.317
Italy	25	15	7.961
Lithuania	1	1	0.002
Luxembourg	1	1	0.436
Malta	4	4	0.047
Netherlands	2	1	0.084
Norway	24	23	1.106
Poland	15	14	0.667
Portugal	4	4	0.927
Romania	3	3	0.050
Slovakia	4	4	0.094
Spain	10	8	8.119
Sweden	4	4	4.860
Switzerland	46	39	5.785
UK	8	6	24.257

Table 2

This table presents definitions and sources of all variables used in this paper.

Variables	Definition	Source
LnGDP	Natural logarithm of gross domestic product	World Development Indicator (WDI)
LnTA	Natural logarithm of bank total assets	Bloomberg
ROE	Bank's net income divided by total equity	Bloomberg
LLP_TL	Bank's loan loss provisions divided by total loans	Bloomberg
Global Integration	Imports plus exports divided by GDP	World Development Indicator (WDI)
MKT_POWER	Bank i total assets in country j divided by total assets of the banking sector in country j	Bloomberg
Private Credit/GDP	Private credit divided by GDP	Financial Structure Dataset (Beck et al., 2010)
Legal Origins	A dummy variable that identifies the legal origin. The legal origins are English, German, French, and Nordic.	La Porta and others (1999)
Independence	Percentage of years since 1776 that a country has become independent	Beck, Demirguc-kunt and Levine (2002)
Supervisory Power	The index ranges from zero to fourteen, with higher values indicating greater power. The index is built on fourteen questions. A value of one is added to the index for each answer that is "Yes". 1) Can supervisors meet external auditors to discuss report without bank approval? 2) Are auditors legally required to report misconduct by managers/directors to supervisory agency? 3) Can legal action against external auditors be taken by supervisor for negligence? 4) Can supervisors force banks to change internal organizational structure? 5) Are off-balance sheet items disclosed to supervisors? 6) Can the supervisory agency order directors/management to constitute provisions to cover actual/potential losses? 7) Can the supervisory agency suspend director's decision to distribute: 7.1. dividends. 7.2. bonuses. 7.3. management fees. 8) Can the supervisory agency supersede bank shareholder rights and declare bank insolvent? 9)Does banking law allow supervisory agency to suspend some or all ownership rights of a problem bank? 10) Regarding bank restructuring & reorganization, can supervisory agency or any other govt. agency do the following: 10.1. supersede shareholder rights. 10.2. remove and replace management. 10.3. remove and replace directors.	Barth et al. (2004, 2006, 2008, 2013)
QG	It is calculated based on the first principle components analysis of six dimensions of governance, with higher values corresponding to better governance. The six dimensions of governance are: 1) Voice and Accountability. 2) Political Stability and Absence of Violence. 3) Government Effectiveness. 4) Regulatory Quality. 5) Rule of Law. 6) Control of Corruption.	Kaufmann et al. (2006)
Private Monitoring	The index ranges from zero to twelve, with higher values indicating more private oversight. The index is composed of the following information: Whether subordinated debt is allowable as part of capital?	Barth et al. (2004, 2006, 2008, 2013)

	Are off-balance sheet items disclosed to the public?; Whether bank directors and officials are legally liable for accuracy of information disclosed to public; Whether banks must publish consolidated accounts; Whether banks must be audited by certified international auditors; Whether 100 percent of the largest ten banks are rated by international rating agencies; Whether off-balance sheet items are disclosed to the public; Whether banks must disclose their risk management procedures to the public; Whether accrued, though unpaid interest/principal, enter the income statement while the loan is still non-performing; Whether there is no explicit deposit insurance system and insurance was paid the last time a bank failed.	
Ethnic Fractionalization	It is the probability that two randomly selected persons in a country will not speak the same language.	Easterly and Levine (1997)
5EU	It is a dummy variable that takes a value of one if banks operate in one of the five largest banking sectors in Europe (i.e. France, Germany, UK, Italy and Spain)	

Table 3
This table shows the construction of the liquidity creation measure and the weights used to calculate the measure adopted from Distinguin et al. (2013).

Assets	Liquidity Level	Weights
Cash & Near Cash Items	Liquidity Level	-0.5
Interbank Assets	Semiliquid	0
Short-Term Investments	Liquid	-0.5
Commercial Loans	Illiquid	0.5
Consumer Loans	Semiliquid	0
Other Loans	Semiliquid	0
Long-Term Investments	Semiliquid	0
Fixed Assets	Illiquid	0.5
Other Assets	Illiquid	0.5
Customers' Acceptance Liability	Semiliquid	0

Liabilities	Liquidity Level	Weights
Demand Deposits	Liquid	0.5
Saving Deposits	Liquid	0.5
Time Deposits	Semiliquid	0
Other Deposits	Semiliquid	0
Short-Term Borrowings & Repos	Liquid	0.5
Other Short-Term Liabilities	Liquid	0.5
Long-Term Borrowings	Semiliquid	0
Other Long-Term Liabilities	Semiliquid	0
Total Preferred Equity	Illiquid	-0.5
Minority Interest	Illiquid	-0.5
Shareholder Common Capital	Illiquid	-0.5
Retained Earnings & Other Equity	Illiquid	-0.5

Table 4.
This table reports the summary statistics of the main regression variables. Sample consists of 220 publicly traded commercial banks from 27 European countries over the period 1996-2010. Definition of variables are reported in Table 2.

Variable	Obs	Mean	Std. Dev.	Min	Max
LC	2,591	0.197	0.153	-0.401	0.841
LC_Assets	2,591	-0.013	0.106	-0.411	0.464
LC_Liabilities	2,591	0.210	0.111	-0.217	0.559
Private Credit/GDP	2,591	0.966	0.452	0.064	2.129
lnGDP	2,591	27.475	1.056	23.627	31.040
LnTA	2,591	16.085	2.416	9.818	21.643
ROE	2,591	0.107	1.221	-6.295	48.787
LLP_TL	2,591	0.025	0.698	-0.059	34.606
Global Integration	2,591	0.780	0.276	0.375	1.914
MKT_POWER	2,591	0.140	0.231	0.00004	1
Supervisory Power	2,461	9.803	2.271	6	14
Ethnic Fractionalization	2,484	0.112	0.102	0.003	0.364
Independence	2,227	0.885	0.242	0.289	1
Private Monitoring	2,474	7.781	1.226	5	11
English	2,591	0.047	0.212	0	1
French	2,591	0.349	0.476	0	1
German	2,591	0.333	0.471	0	1
Scandinavian	2,591	0.271	0.445	0	1
5EU	2,591	0.309	0.462	0	1
QG	2,241	0.0399	2.186	-7.299	3.158

Table 5.

The table shows IV regressions for the effect of official supervisory power and private sector monitoring on the bank liquidity creation and its two main components. The potential endogenous explanatory variables are supervisory power and private monitoring. Robust z-statistics are in parentheses. *, **, *** indicate significance at the 10%, 5% and 1% levels, respectively. Definition of the variables are reported in Table 2.

	LC	LC_Assets	LC_Liabilities	LC	LC_Assets	LC_Liabilities
Supervisory Power	-0.022***	-0.024***	0.002			
	(0.006)	(0.005)	(0.004)			
Private Monitoring				0.081***	0.088***	-0.007
				(0.026)	(0.021)	(0.015)
Private Credit/GDP	0.049***	0.035***	0.014**	-0.038*	-0.060***	0.022*
	(0.009)	(0.007)	(0.006)	(0.022)	(0.017)	(0.013)
lnGDP	-0.020***	-0.023***	0.003	-0.022***	-0.024***	0.003
	(0.005)	(0.004)	(0.004)	(0.006)	(0.005)	(0.004)
LnTA	0.023***	0.009***	0.014***	0.023***	0.009***	0.014***
	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)	(0.001)
ROE	0.006***	0.003***	0.003	0.006***	0.003***	0.003
	(0.002)	(0.001)	(0.002)	(0.002)	(0.001)	(0.002)
LLP_TL	-0.015***	-0.004***	-0.011***	-0.013***	-0.002**	-0.011***
	(0.003)	(0.001)	(0.002)	(0.003)	(0.001)	(0.002)
Global Integration	0.058***	0.023**	0.035***	0.023	-0.014	0.037***
	(0.012)	(0.010)	(0.009)	(0.015)	(0.012)	(0.009)
MKT_POWER	-0.119***	-0.013	-0.106***	-0.132***	-0.028	-0.104***
	(0.019)	(0.016)	(0.014)	(0.025)	(0.021)	(0.015)
5EU	0.002	-0.054***	0.055***	0.035***	-0.017**	0.052***
	(0.012)	(0.008)	(0.008)	(0.009)	(0.008)	(0.006)
Instruments	Ethnic Fractionalization	Ethnic Fractionalization	Ethnic Fractionalization	Ethnic Fractionalization	Ethnic Fractionalization	Ethnic Fractionalization
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Constant	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,439	2,439	2,439	2,457	2,457	2,457

P-value of first stage F-test of excluded instruments	0.000	0.000	0.000	0.000	0.000	0.000

Table 6.
The table shows the IV regressions for the effect of bank liquidity creation on regulatory policies
by bank size. The potential endogenous explanatory variables are supervisory power and private
monitoring. Robust z-statistics are in parentheses. *, **, *** indicate significance at the 10%, 5%
and 1% levels, respectively. Definition of the variables are reported in Table 2.

	LC		LC	
	Large banks	Small Banks	Large banks	Small Banks
Supervisory Power	-0.040***	0.061***		
	(0.007)	(0.013)		
Private Monitoring				-0.091***
				(0.019)
Private Credit/GDP	0.065***	0.001	-0.639	0.150***
	(0.012)	(0.025)	(0.727)	(0.017)
lnGDP	-0.034***	0.093***	-0.105	0.094***
	(0.006)	(0.014)	(0.108)	(0.014)
LnTA	0.018***	0.011	-0.004	0.019**
	(0.003)	(0.010)	(0.024)	(0.009)
ROE	0.006***	0.019	0.006	0.052
	(0.001)	(0.101)	(0.005)	(0.093)
LLP_TL	-0.025***	-0.015***	-0.068	-0.016***
	(0.005)	(0.003)	(0.061)	(0.003)
Global Integration	0.071***	0.175***	0.004	0.348***
	(0.016)	(0.027)	(0.087)	(0.046)
MKT_POWER	-0.147***	0.407***	-0.546	0.420***
	(0.022)	(0.077)	(0.524)	(0.080)
5EU	-0.029**	0.092***	-0.027	-0.040
	(0.014)	(0.025)	(0.089)	(0.037)
Instruments	Ethnic Fractionalization	Ethnic Fractionalization	Ethnic Fractionalization	Ethnic Fractionalization
Year Dummies	Yes	Yes	Yes	Yes
Constant	Yes	Yes	Yes	Yes
Observations	1,996	443	2,014	443
P-value of first stage F-test of excluded instruments	0.000	0.000	0.37	0.000

Table 7.
This table reports the OLS regressions for the effect of quality of governance and legal origins on bank liquidity creation and its two main components. Robust p-values are in parentheses. *, **, *** indicate significance at the 10%, 5% and 1% levels, respectively. Definition of the variables are reported in Table 2.

	LC	LC_Assets	LC_Liabilities	LC	LC_Assets	LC_Liabilities
QG	-0.030***	-0.029***	-0.002			
	(0.009)	(0.006)	(0.006)			
French				-0.180***	-0.151***	-0.029**
				(0.017)	(0.013)	(0.014)
German				-0.298***	-0.190***	-0.108***
				(0.046)	(0.034)	(0.029)
Scandinavian				-0.153***	-0.091***	-0.062***
				(0.031)	(0.022)	(0.020)
Private Credit/GDP	0.025*	0.019**	0.005	0.014	0.015**	-0.001
	(0.013)	(0.009)	(0.010)	(0.010)	(0.007)	(0.007)
lnGDP	-0.002	0.016	-0.018	-0.068***	-0.034**	-0.034**
	(0.035)	(0.027)	(0.021)	(0.024)	(0.017)	(0.014)
LnTA	0.004	-0.003	0.007***	0.007***	-0.002	0.008***
	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
ROE	0.007***	0.004**	0.003	0.008***	0.004***	0.004
	(0.001)	(0.002)	(0.002)	(0.002)	(0.001)	(0.003)
LLP_TL	-0.019***	-0.005***	-0.014***	-0.019***	-0.006***	-0.014***
	(0.003)	(0.001)	(0.002)	(0.003)	(0.001)	(0.002)
Global Integration	0.313***	0.179***	0.134***	0.472***	0.253***	0.219***
	(0.041)	(0.028)	(0.027)	(0.041)	(0.026)	(0.027)
MKT_POWER	0.016	0.014	0.002	-0.011	0.011	-0.022
	(0.025)	(0.019)	(0.017)	(0.023)	(0.018)	(0.015)
Constant	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Country Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,241	2,241	2,241	2,591	2,591	2,591
F-test	24.98	16.85	58.63	33.28	22.60	65.37

Table 8.
This table shows the results for IV regressions which examine the interplay effect of official supervisory power and private monitoring on bank liquidity creation. The potential endogenous explanatory variables are supervisory power, private monitoring, the interaction term between supervisory power and quality of governance and the interaction term between private monitoring and quality of governance. Robust z-statistics are in parentheses. *, **, *** indicate significance at the 10%, 5% and 1% levels, respectively. Definition of the variables are reported in Table 2.

	LC	LC
Supervisory Power	0.102**	
	(0.044)	
Private Monitoring		-0.369***
		(0.091)
QG	0.492**	-0.924***
	(0.210)	(0.202)
Supervisory Power × QG	-0.048**	
	(0.021)	
Private Monitoring × QG		0.120***
		(0.026)
Instruments	Ethnic Fractionalization Years of Independence	Ethnic Fractionalization Years of Independence
Controls	Yes	Yes
Year dummies	Yes	Yes
5EU	Yes	Yes
Constant	Yes	Yes
Observations	2,084	1,868
SW multivariate F-test (Supervisory Power)	11.59***	
P-value of first stage F-test of excluded instruments (Supervisory Power)	0.000	
SW multivariate F-test (Supervisory Power × QG)	11.82***	
P-value of first stage F-test of excluded instruments (Supervisory Power × QG)	0.000	
SW multivariate F-test (Private Monitoring)		23.86***
P-value of first stage F-test of excluded instruments (Private Monitoring)		0.000
SW multivariate F-test (Private Monitoring × QG)		40.29***
P-value of first stage F-test of excluded instruments (Private Monitoring × QG)		0.000

Table 9.
This table shows the results which examine the long-run effect of regulatory and supervisory policies on bank liquidity creation. All explanatory variables are lagged by 1, 2, or 3 years. The potential endogenous explanatory variables are supervisory power and private monitoring. Robust z-statistics are in parentheses. *, **, *** indicate significance at the 10%, 5% and 1% levels, respectively. Definition of the variables are reported in Table 2.

	LC	LC	LC	LC	LC	LC
Supervisory Power$_{t-1}$	-0.021***					
	(0.006)					
Supervisory Power$_{t-2}$		-0.024***				
		(0.006)				
Supervisory Power$_{t-3}$			-0.027***			
			(0.006)			
Private Monitoring$_{t-1}$				0.075***		
				(0.024)		
Private Monitoring$_{t-2}$					0.075***	
					(0.022)	
Private Monitoring$_{t-3}$						0.081***
						(0.020)
Instruments	Ethnic Fractionalization	Ethnic Fractionalization	Ethnic Fractionalization	Ethnic Fractionalization	Ethnic Fractionalization	Ethnic Fractionalization
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Constant	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,257	2,080	1,911	2,275	2,098	1,929
P-value of first stage F-test of excluded instruments	0.000	0.000	0.000	0.000	0.000	0.000

Table 10.
Panel A of this table shows the results of IV regressions for the effect of regulatory policies on an aggregate bank liquidity creation measure for each country. The potential endogenous explanatory variables are supervisory power, private monitoring, the interaction term between supervisory power and quality of governance, and the interaction term between private monitoring and quality of governance. The dependent variable is an aggregate bank liquidity creation measure for each country and year. Robust z-statistics are in parentheses. Panel B of this table shows the results for OLS regressions which examine the effect of quality of nationwide governance and legal origins on aggregate bank liquidity creation. Robust p-values are reported in parentheses. *, **, *** indicate significance at the 10%, 5% and 1% levels, respectively. Definition of the variables are reported in Table 2.

Panel A: The effect of regulatory policies on country-level liquidity creation

	LC	LC	LC	LC
Supervisory Power	-0.091***	0.153*		
	(0.027)	(0.088)		
Private Monitoring			0.213***	-0.167*
			(0.083)	(0.086)
QG		0.721*		-0.942**
		(0.403)		(0.373)
Supervisory Power × QG		-0.074*		
		(0.042)		
Private Monitoring × QG				0.120**
				(0.047)
Instruments	Ethnic Fractionalization	Ethnic Fractionalization Years of Independence	Ethnic Fractionalization	Ethnic Fractionalization Years of Independence
Controls	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes
5EU Dummies	Yes	Yes	Yes	Yes

Constant	Yes	Yes	Yes	Yes
Observations	378	268	385	272
SW multivariate F-test (Supervisory Power)	15.14***	3.56*		
P-value of first stage F-test of excluded instruments (Supervisory Power)	0.000	0.000		
SW multivariate F-test (Supervisory Power $\times$ QG)		3.45*		
P-value of first stage F-test of excluded instruments (Supervisory Power $\times$ QG)		0.000		
SW multivariate F-test (Private Monitoring)			12.27***	8.01***
P-value of first stage F-test of excluded instruments (Private Monitoring)			0.000	0.000
SW multivariate F-test (Private Monitoring $\times$ QG)				8.51***
P-value of first stage F-test of excluded instruments (Private Monitoring $\times$ QG)				0.000

Panel B: The effect of quality of governance and legal origins on country-level liquidity creation

QG	-0.043***	
	(0.014)	
French		-0.193***
		(0.019)
German		-0.167***
		(0.052)
Scandinavian		-0.093**
		(0.038)
Macro-Controls	Yes	Yes
Year Dummies	Yes	Yes
Country Dummies	Yes	Yes
Constant	Yes	Yes
Observations	385	405
F-test	21.64	22.87