Global financial crisis, international capital requirement and bank financial stability: an international evidence

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Abstract

Purpose – Financial crises (FC) remain a global threat to the financial stability of financial institutions and international bank regulatory capital requirement (IBRCR) by the Committee on Banking Supervision provides mechanism for curbing the adverse effect of FC on financial stability. Hence, the purpose of this study is to provide, evidence on how IBRCR tones down the adverse FC effects on bank financial stability (BFS).

Design/methodology/approach – The study uses 102 economies between 2006 and 2016 in a two-step dynamic generalized method of moments model.

Findings – The results show that while FC and IBRCR negatively and positively impact BFS, respectively, it is observed that under the increasing presence of IBRCR, the negative effect of FC on BFS declines. Additionally, the results show that economies that maintain minimum IBRCR above 10.5% recommended by BASEL III are able to reinforce a significant reduction in the negative effect of FC on BFS.

Practical implications – These findings imply that in as much as financial crisis is injurious to BFS, regulators and policymakers can rely on IBRCR to avert the injurious effects of FC on BFS. Clearly, while IBRCR is necessary for reinforcing BFS through FC, bank managers who maintain IBRCR above the recommended 10.5% stands a better chance to taming the avert effect of FC on BFS. Additionally, economies that have not full adopted the BASEL minimum capital requirement may have to do so given its potential of dampening the adverse effect of FC on BFS.

Originality/value – The study presents an international perspective of how BASEL capital requirements can help tame global financial crisis using a global sample of 102 economies.

Keywords Stability, Capital requirement, Financial crisis, Financial stability

Paper type Research paper

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Introduction

Reinhart and Rogoff (2014, 2009) document that many economies around the world have suffered several severe financial crises, which has impede the stability of banks and other financial institutions. They argue that financial crises can be traced from 18th centuries and caused by sovereign (public) default and bank (private) failures. Evidently, while financial crises are not recent adverse events in the worlds' financial system, their contagious effects on the growth and development across economies have been extremely devastating, especially during the 2007–2009 global financial crisis (Liu *et al.*, 2019; Ahmed *et al.*, 2017; Ahmed *et al.*, 2016; Tabata, 2009). Thus, financial crises are viewed as disturbance or unfavorable shocks that emanate from the operations and activities of financial market participants, including financial institutions, regulators and households. Interestingly, while literature shows that financial crisis is deemed to have been mainly caused by excessive risk-taking by financial institutions (Cai and Zhang, 2017; Imbierowicz and Rauch, 2014; Varotto, 2011; Crotty, 2009) and laxity in financial regulations and governance (Carmassi *et al.*, 2009; Acharya and Richardson, 2009; Acharya *et al.*, 2009), its effects include lack of investor confidence (Osili and Paulson, 2014; Gay *et al.*, 1991), loss of employment (Schoen, 2017; Dhameja, 2010; Overholt, 2010), undue fiscal (Turrini *et al.*, 2012; Honohan and Klingebiel, 2003) and monetary policy (Nakatani, 2016; Dell'Ariccia *et al.*, 2008; Hua Jiang, 2008; Smith, 2002) pressures, downgrading of economy by international rating agencies (Kerstein and Kozberg, 2013; Öğüt *et al.*, 2012; Derviz and Podpiera, 2008) and financial instability (Ozili, 2018; Alqahtani and Mayes, 2018).

Following the possible contagious adverse effects of financial crisis, as documented during the 2007–2009 global financial crisis (Park and Shin, 2020; Lee *et al.*, 2018; Wang *et al.*, 2017), both international- and national-level regulators in the worlds' financial framework seek to device mechanisms that tame the adverse effect of financial crisis. As such, BASEL I, II and III remain good international examples of such mechanisms that attempt to curb financial crisis and promote the stability and soundness of banks across borders. Interestingly, given the important role played by capital adequacy in maintaining banking stability across the globe, the BASEL I, II and III guidelines provide frameworks for computing and maintaining capital adequacy of banks across borders. Specifically, BASEL III, which is the most recent and well-known international capital regulatory requirement, recommends banks to maintain a 10.5% capital-to-risk weighted assets ratio as at 2020 (Nguyen *et al.*, 2021; Rubio and Carrasco-Gallego, 2016; Li *et al.*, 2016). BASEL III framework combines capital adequacy, stress testing and market liquidity risk as mechanisms for supervising bank capital, operations and market activities.

Given that international capital adequacy requirements are engineered to tame banking crisis and enhance banking stability by regulators and policymakers (Korbi and Bougatef, 2017; Oduor *et al.*, 2017), there is an empirical lacuna where majority of existent studies have focused on how national-level capital adequacy requirements affect banking stability at the expense of how international capital requirements (BASEL capitalization requirements) affects the stability of banks. Additionally, with the empirical notion that capital adequacy is engineered to soak up and or curtail financial crisis to enhance stability of banks (Ryan, 2017; Uhde and Heimeshoff, 2009; Crockett, 1997), it has become imperative to examine how international capital requirements, specifically, capital to risk-weighted assets modulates the effect of financial crisis to enhance stability of banks as there are limited to no studies that examine this nexus. Thus, we expect capital to risk-weighted asset to complement the financial crisis by reducing the negative effect of financial crisis to enhance stability of banks. Again, we attempt to document how international capital requirements affect stability in financial crisis and non-financial crisis periods to deepen our understanding on

the relevance of international capital requirements in reinforcing stability. Furthermore, we attempt to estimate both the long-run, short-run and synergetic effects of international capital adequacy requirement (capital to risk-weighted ratio) and financial crisis on banking stability for the first time to the best of our knowledge. Additionally, we show how increasing international capitalization requirement suppresses financial crisis to promote stability. This is done to show how important it is for policymakers and regulators to ensure a minimum capital of 8%. The rest of the paper is organized into overview, literature review, methodology, results and discussions and conclusions, implications and recommendations.

Overview of financial crisis, international capital adequacy requirement and stability

Several financial crises have been document in history dating from the 18th century. These financial crises are adverse shocks that distract the smooth functioning and dealings of financial market participants. Historically, seven major financial crises are documented from the great depression in 1932 to great recession in 2007–2009. After the great depression, which caused fierce financial crisis in 1932, the Suez Crisis in 1956, the Asian Economic crisis between 1997 and 1982, the Latin American debt crisis between 1994 and 2002 and the global financial crisis have also been documented as major events that gave rise to major financial crisis in history (Ocampo, 2014; Gorst and Johnman, 2013; Hunter *et al.*, 2012). Notwithstanding, there have been national- or country-level crisis like the Greece crisis in 2009; Russian crisis in 2014, Brazilian crisis between 2014 and 2017, Spanish crisis between 2008 and 2016, Argentine crisis between 1999 and 2002, Ghanaian banking crisis between 2017 and 2018, Turkish crisis in 2001 and 2018, Uruguay crisis in 2002, Iceland crisis between 2008 and 2012 and Irish crisis between 2008 and 2010.

Aside these crisis, the banking crisis in Germany and the USA in 1974 influenced the formation of BASEL Committee on Banking Supervision by the central bank governors of the G10 countries to improve the quality of banking supervision. While the Committee has no supervision authority on member countries and its recommendations are not legally binding, its recommendations have evolved (Shakdwipee and Mehta, 2017; Rubio and Carrasco-Gallego, 2016; Cousin, 2012) and proven very useful and importance for curbing financial crisis and improving banking stability around the world. In 1988, the Committee came up with the BASEL Capital Accord I, which was credit risk measurement framework with minimum capital standard of 8%. With BASEL I recommendations largely informed by lessons of depleting capital of international banks in Latin American debt crisis, BASEL I focused on specifying and determining the required minimum capital of 8% for banks to be implemented by 1992. Under BASEL I, capital adequacy was computed as the sum of Tier 1 and Tier II divided by risk-weighted assets (Shakdwipee and Mehta, 2017).

BASEL II was designed to upgrade or update BASEL I. BASEL II moved from just offering minimum capital requirements to introducing supervisory review of capital adequacy, internal assessment processes and effective use of disclosure as a tool for strengthening market discipline. Unlike BASEL I, which categorized eligible regulatory capital of banks into two tiers, BASEL II categorized eligible regulatory capital of banks into three tiers. Tier 1 capital comprised of the core equity capital of the bank and disclosed/audited reserves and used to absorb losses that does not require the bank to permanently stop operations. Tier 2 capital, on the other hand, is used when the bank has lost all its Tier 1 capital and is winding up or being liquidated. Tier 2 capital includes undisclosed reserves, revaluation reserves, general provisions and loss reserves, hybrid capital instruments, subordinated debts and investment reserve account. Similarly, Tier 3 capital, defined as

tertiary capital, is aimed at helping banks manage market, commodities and foreign exchange risks (Rubio and Carrasco-Gallego, 2016).

Although BASEL III is an upgrade of BASEL II, it focuses on three principal principles capital adequacy requirements, stress testing and market liquidity risk (Nguyen *et al.*, 2021; Li *et al.*, 2016). The third principle, market liquidity risk, was introduced as a result of lessons learned from the 2007–2009 global financial crisis. The intent of BASEL III is to strengthen bank capital requirements by increasing minimum capital requirements, holdings of high quality liquid assets and decreasing bank leverage. Under BASEL III, Tier 3 capital introduced under BASEL II was rescinded and recommending a minimum capital requirement of 8% of its risk-weighted assets plus 2.5% capital conservation buffer as at 2020. The capital conservation buffer recommendation is designed to build up banks' capital, which they could use in periods of stress. In sum, the BASEL Committee recommendations have evolved over time have developed recommendations for managing capital risk, market risk and operational risk. The core of the recommendations is to ensure financial institutions are adequately resilient to meet their obligations and absorb unexpected losses (Shakdwipee and Mehta, 2017; Cousin, 2012).

From Tables 1 and 2, trends in financial stability (ZSCORE) and capital requirement (RW CAPITAL) are presented and discussed. In Table 1, yearly trends are presented and discussed, while in Table 2, trends across financial crisis and non-financial crisis periods are presented and discussed. The information on financial stability and risk-weight capital adequacy are obtained from the Global Financial Development database, while information on private and public sector-led financial transparency are obtained from World

YEARS	ZSCORE	RW CAPITAL
2006	13.313	16.073
2007	13.373	15.356
2008	12.752	15.628
2009	13.361	16.911
2010	13.73	17.14
2011	13.903	16.967
2012	14.306	17.736
2013	13.951	17.871
2014	13.721	17.902
2015	14.164	18.16
2016	14.304	18.72

Source: Compiled by authors based on data from Global Financial Development database and World Development Indictors database

Table 1. Year trends in stability, capital requirement and transparency between 2006 and 2016

Variables	CRISIS ERA	NON-CRISIS ERA
Z-SCORE	13.062	13.352
RW CAPITAL	15.496	16.66
PrST	19.07	23.912
PuST	4.786	8.73

Source: Compiled by authors based on data from Global Financial Development database and World Development Indictors database

Table 2. Stability, capital requirement and transparency across financial crisis and non-crisis periods

Development Indictors database. Following the trends in financial stability in Table 1, financial of banks declined during 2007 and 2009 when the global financial crisis occurred. This is not surprising, given as the crisis at the time worsened the financial stability of financial institutions across the globe. Similarly, between 2013 and 2014, financial stability again declined. In terms of capital adequacy computed as Tier 1 and 2 capitals to risk-weight assets, we observe a decline between 2007 and 2009, and this decline can be attributed to the 2007–2009 global financial crisis, which depleted the capital of most financial institutions around the globe. Despite the decline, capital adequacy still remains higher above the recommended threshold of 10.5%. Considering financial crisis and non-financial crisis periods (Table 2), there is evident of crisis periods reporting lower financial stability, capital adequacy, private and public sector-led financial sector transparencies compared to non-financial crisis periods. This provides a strong indication and confirms the observe trends in the table that financial crisis can be distractive to financial institutions, sectors and markets. Thus, there is an observed interlinkages among capital adequacy requirement and financial sector transparency on financial stability, which require further empirical investigation.

Literature review: theories and empirics

The concept of financial stability is of great importance to policymakers partly because of the contagious adverse effect of past financial stability failures (Dungey *et al.*, 2020; Morris and Shin, 2012; Chung, 2005). The discussions on financial stability have largely focused on the causes and consequence of financial instability as policymakers are more interested averting financial instability and maintaining stability in the financial market. While issues on the existence of financial stability or instability are hinged on risk emanating from the financial intermediation process, as suggested by the financial intermediation theory (Kusi, 2021), the cyclical and monetarist concept of financial stability (Kurowski and Smaga, 2018; RAdke, 2018) and, more recently, the game theory and decision-making under uncertainties (Aikman *et al.*, 2019; Mitrache, 2018; Goodhart, 1994) have offered more detailed insights to explain the causes or sources of financial instability. First, the financial intermediation theory suggests that the financial intermediation functions performed by financial institutions are shredded in risky activities which can cause financial instability if not well-managed. That is, risks such as credit risk and losses, interest rate risk, investment and financing risks, inflationary risk and the likes can create disruptions in the performance of financial intermediation functions to cause a decline in financial stability (Karikari *et al.*, 2021). Within the financial intermediation theory framework, the actions and inactions of the financial market participants, including, borrowers, depositors, savers, managers, regulators and investors, are the key sources of financial instability.

The cyclical view argues that occurrence of disruptions that worsen financial stability occurs in a cycle, implying that financial disruptions leading to decline or worsening financial stability are pro-cyclical (Kurowski and Smaga, 2018; Radke, 2018). This is the oldest concept of financial stability but offers very little in explaining financial stability. The monetarist argue that disruptions hurt the financial stability emanate from the decisions and reactions from changes in money supply. Thus, according the monetarist, disruptions that impede financial stability are reflections of monetary policy decision outcomes. However, in recent time, the game theory and decision-making under uncertainties have offered more behavioral insights to explaining the causes or sources of financial instability. The game theory and decision-making under uncertainties argue that the actions, inactions and decision of microeconomic agents in financial market in the pursuit of profit maximization objective without having complete, full and reliable information create

distortions in the financial market leading to depletion in financial stability (Aikman *et al.*, 2019; Mitrache, 2018; Goodhart, 1994). Clearly, issues such as moral hazard (on the part of managers, regulators and borrowers) and adverse selection are critical to creation of distortions that hurt financial stability under the game theory and causes financial instability.

Focusing on the empirical literature, the study details and discusses on studies that investigate the effects of capital requirements and financial crisis on financial stability. Starting with capital regulatory requirements, a number of studies (Wang *et al.*, 2021; Korbi and Bougatef, 2017; Adrian and Shin, 2010; Crockett, 1996) have examined this nexus. For instance, Wang *et al.* (2021) examined the effect of capital regulation supervision and information disclosure on risk-taking of 44 rural banks in China between 2012 and 2019. Using a panel regression model, their results show that capital regulation supervision and information disclosure improve the stability of banks by lowering risk-taking within the rural bank industry of China. Similarly, Danarsari and Rokhim (2018) examined the nexus between capital buffer and banking stability within the Indonesian commercial bank industry. The study uses dynamic panel model covering periods between 2001 and 2015 and found that increases in capital buffer significantly promote banking stability. Additionally, bank market power, size and income diversification are found to positively and significantly promote banking stability. Moreover, Korbi and Bougatef (2017) investigated how regulatory capital influences the stability of Islamic and conventional banks using banks from Middle East and North Africa regions over 1999 to 2014. The results reveal that Islamic banks appear to be less stable, while regulatory capital is found to be the primordial factor that reinforces banking stability. Interestingly, macroeconomic and institutional variables are found significantly influence banking stability, especially corruption. Contrary to the above studies, Oduor *et al.* (2017) investigated banking capital adequacy on financial stability using 167 banks from 37 African economies and reported using panel regression models that improved capital adequacy significantly worsened financial stability except for large banks. This implies that higher capital requirements worsens banking stability. Interestingly, they further report that increased regulatory capital improves competitive pricing for foreign banks and makes domestic banks less competitive due to increased cost of equity capital financing.

In terms of financial crisis and financial stability, studies have largely sought to investigate how financial crisis affects the nexus between financial stability and other variables (competition, income diversification, disclosure, banking types). Studies that examined the direct effect of financial crisis on stability are not almost non-existent. Hence, the study discusses empirical studies that have sort to investment how financial crisis influence the link between financial stability and other variables are indicated above. First, Kim *et al.* (2020) investigated the effects of income diversification before, during and post-financial crisis on financial stability using commercial banks from Organization for European Economic Co-operation economies. Using pooled ordinary least square (OLS) and random effect panel models, their result shows that while income diversification has a non-linear effect on financial stability, these effects largely depend on financial crisis. Thus, while, financial crisis increases the dampening effect of income diversification on financial stability, implying that financial stability can be compromised during financial crisis through income diversification. Similarly, Akins *et al.* (2016) examined the nexus between competition and financial stability in the financial crisis era using the 2007–2009 global financial crisis as a crisis era example. Using panel regression strategies, they report that while banks facing less competition engage in riskier activities are likely to face regulatory interventions and fail, less competition in the real estate mortgage banking leads to price

instability during crisis and translates into decline in financial stability. More so, Alqahtani and Mayes (2018) studied how Islamic and conventional banks performed in terms of their financial stability. The study uses 76 banks comprising of 52 conventional banks and 24 Islamic banks between 2000 and 2013. Using fixed effect and dynamic generalized method of moments (GMM) panel models, the results suggest that during the global financial crisis, the financial stability of larger and bigger Islamic banks suffered more compared to that of their conventional banks. Interestingly smaller Islamic banks demonstrated greater resilience during the financial crisis period. Moreover, Dietrich and Vollmer (2012) examined the contribution of universal banking to financial stability of banks during the global financial crisis in Germany. Their findings demonstrate that the global financial crisis contributed to the collapse of few banks, but these collapsed banks did because they were publicly owned not because they were universal banks.

From the theoretical and empirical review, it is evident that financial stability is compromised by the disruptive nature of financial market participants' decisions and actions. As such, financial crisis emerges as a result of accumulated adverse effect of financial market participant decisions and actions. Thus, the disruptive nature of financial crisis arises from behavioral, moral hazard and adverse selection actions on the part of managers, regulators and borrowers in the financial market as are result of incomplete and inaccurate information. However, to avert the adverse effect of financial instability arising from financial crisis, regulators have instituted international capital regulatory mechanisms with the aim to tame the disruptive nature of financial crisis on financial stability. Following the empirical review, it is surprising that few studies have examined how international capital regulation moderates or mitigates the adverse effect of financial crisis on financial stability using a cross-country data set. Hence, this study attempts to provide such global evidence, especially when the core aim of international bank capital regulation (BASEL I, II and III) is to curb financial crisis and improving banking stability around the world. Hence, this study provides empirical evidence as to how international capital regulation tames financial crisis to enhance financial stability of banks across the globe.

Methodology

This study uses the panel data technique to examine how international capital regulatory capital tames the effect of financial crisis on financial stability using data of 102 economies between 2006 and 2016. It is argued that the panel data strategy produces more convincing and robust results compared to the traditional time series and cross-sectional data techniques (Brooks, 2015; 2003; Wooldridge, 2009). Macroeconomic variables are obtained from World Development Indicators database, while country-level bank data is obtained from Global Financial Development database. The period (2006–2016) being investigated is selected purely based on availability of data, while the criteria for inclusion is that each country included should at least have four years of data. The general panel data strategy is expressed as:

$$Y_{i,t} = \alpha_i + \gamma_t + \beta X_{i,t} + \varepsilon_{i,t} \tag{1}$$

where subscripts i and t represent entity (country) and time dimensions, respectively, with i running from 1. . .N and t running from 1. . .T. Y_{it} is the dependent variable, α_i is scalar and constant term for all periods (t) and specific to a country fixed effects (i); γ_t is the time fixed effects t; β *is a* $k \times 1$ vector of parameters to be estimated on the independent variables; *Xit is a* $1\times$ k vector of observations on the independent variables comprising of input variables in the model, which includes controlled variables and ε_{it} which is iid, is the error term.

In the modeling of financial stability, the study follows the prior studies of Ozili (2018) and Wang *et al.* (2021). In terms of estimation technique, the two-step dynamic GMM is used for some reasons. First, literature (Tchamyou, 2020; Asongu *et al.*, 2019) suggests that when the persistence of the dependent variable exceeds 0.8 (Appendix 1), the GMM is a good fit. As such, Appendix 1 shows that the persistence in the dependent variable exceeds 0.8, hence making the GMM a good estimation model for this study. Second, literature (Tchamyou, 2020; Asongu *et al.*, 2019) advances that when the number of entities is greater than the number of time series, the GMM produces more robust and reliable results. Hence, given that the number of countries (102) is greater than time series (11), the GMM is a good estimation technique for this study. Third, the GMM is used for this study because it has the ability control for endogeneity, which may arise as a result of introducing the lag of the dependent variable into the GMM model. Interestingly, in resolving endogeneity problems, instruments that are correlated with the endogenous variable but not the error term and have theoretical and intuitive justification are required. Thus, finding instruments that have these properties to be used in a two- or three-stage models is very difficult and almost impracticable. Hence, because the GMM generates its own internal instruments using the lag of the dependent variable, it reliefs the researcher of the difficulty or challenge of finding econometrically and intuitively suitable instruments. Fourth, the GMM also adjusts for cross-sectional dependence when present in the data and reduces the proliferation of instruments (Tchamyou, 2020; Love and Zicchino, 2006), which makes the GMM more suitable and desirable in this study. The general dynamic panel GMM is modeled following equation (2):

$$Y_{i,t} = \alpha Y_{i,t-1} + \Phi Z_{i,t} + \mu A_{i,t} + \pi[U_{it}] + \lambda X_{i,t} + \varepsilon_{i,t} \tag{2}$$

Y is financial stability; Z is the measure financial crisis; A is the measure of international bank regulatory capital; U is the interactive term of financial crisis and international bank regulatory capital; X is the range of additional factors that are established in the literature to influence bank stability; α, Φ, π and Λ are the coefficients of the respective variables. The contextualized versions of the models are expressed as follows:

$$FINSTAB_{i,t} = \beta_1 FINSTAB_{i,t-1} + \beta_2 FINCRISIS_{i,t} + \beta_3 REGCAP_{i,t} + \beta_j \sum_{j=4}^{N} X + \varepsilon_{ij,t} \tag{3}$$

$$FINSTAB_{i,t} = \beta_1 FINSTAB_{i,t-1} + \beta_2 FINCRISIS_{i,t} + \beta_3 REGCAP_{i,t} + \beta_4 [FINCRISIS * REGCAP]_{i,t} + \beta_j \sum_{j=5}^{N} X + \varepsilon_{ij,t} \tag{4}$$

$$FINSTAB_{i,t} = \beta_1 FINSTAB_{i,t-1} + \beta_2 [FINCRISIS * STREGCAP]_{i,t} + \beta_3 [FINCRISIS * WKREGCAP]_{i,t} + \beta_j \sum_{j=4}^{N} X + \varepsilon_{ij,t} \tag{5}$$

$$FINSTAB_{i,t} = \beta_1 FINSTAB_{i,t-1} + \beta_2 [FINCRISIS * HGREGCAP]_{i,t} + \beta_3 [FINCRISIS * LOREGCAP]_{i,t} + \beta_j \sum_{j=4}^{N} X + \varepsilon_{ij,t} \quad (6)$$

$$\partial FINSTAB / \partial FINCRISIS = \beta_2 + \beta_4 [REGCAP]_{i,t} \quad (7)$$

Equation (3) provides results on the effect of financial crisis and bank regulatory capital on financial stability, while equation (4) captures the effect of financial crisis on financial stability in the presence of bank regulatory capital and the synergetic and complementarity effects of financial crisis and bank regulatory capital on financial stability. Equation (5) presents the effect of financial crisis under strong and weak [1] bank regulatory capital on financial stability, while equation (6) presents the effect of financial crisis under high and low [2] bank regulatory capital on financial stability. Equation (7) allows for the assessment of synergetic and complementary and net effects of financial crisis and bank regulatory capital on financial stability.

Variable selection, description and measurements

Financial stability is used as the dependent variable and measured with z-score. Following prior literature (Ozili, 2018; de Nicolo *et al.*, 2006), it is computed as the sum of capital adequacy ratio plus return on assets all divided by the standard deviation of return on assets. Higher value of the z-score indicates more bank financial stability. In essence, the z-score shows how far a bank is away from financial distress and is obtained from Global Finance Development database. Following the literature on financial/banking crisis (Ozili, 2018; Crotty, 2009; Goddard *et al.*, 2009), it is clear that crisis in the banking or financial sector reduces stability largely because crises are characterized with reduced bank client trust and increased bank panic withdrawals, which escalates the financial stability of banks. Bank regulatory capital is used as a capital adequacy measure and is obtained from Global Finance Development database. It is measured following BASEL III capital adequacy ratio, which is captured as the sum of Tier 1 and 2 capitals divided by total risk weighted assets. Higher values of bank regulatory capital is preferred and indicates higher or improved ability to absorb and deal with credit losses, risks and unanticipated shocks (Ozili, 2018; Beck *et al.*, 2013; Diamond and Rajan, 2000). The expectation is that bank regulatory capital will enhance financial stability of banks. Additionally, because bank regulatory capital is designed to help banks to soak up shocks from financial activities and crisis, it is expected that bank regulatory capital will tone down the adverse effect of financial crisis on financial stability of banks.

In terms of the control variables, bank margins, which is a proxy for banking sector operational profitability, is computed as the difference between interest income and interest expense divided by total assets (Ozili and Uadiale, 2017; Athanasoglou *et al.*, 2008). It is expected that banking profits will translate into improving financial stability of banks following prior studies (Dwumfour, 2017). Also, financial sector transparency is used as a financial market transparency variable and is obtained from World Development Indicators database. Following prior studies (Kusi, 2021; Kusi *et al.*, 2021, 2020), it is assumed that enhancing transparency in the financial market will reduce information asymmetry, which could translate into lower cost equity/capital financing and reduced capital deterioration. Hence, financial sector transparency, whether led by the private or public sector, should

improve bank financial stability. Furthermore, bank non-interest income is used as a proxy for income diversification and represents the income generated by the bank outside its core intermediation functions (Ozili, 2017a; Williams, 2016). Thus, a higher value of bank diversification is an indication of higher bank stability because it implies that banks do not rely on solely interest income, which is considered unstable, given the competitive nature of banking. Hence, a positive relationship may exist between bank diversification and stability. However, Stiroh (2004), highlights the dark side of diversification by stating that diversification may lead to reduced stability when management diversifies to areas where it lacks core competence and competitive advantage. Similarly, bank market power, which shows the degree to which banks have control over pricing their products and services and is measured with Lerner index. It is measured as the difference between output price and marginal cost scaled over the output price (Kusi *et al.*, 2020; Tan, 2016). Thus, higher Lerner values indicate that banks have higher control over prices and is expected to promote stability. Bank concentration, which depicts the structure of the banking industry and is computed using the total asset of the three largest banks in an economy to the total banking market assets. Following the concentration-fragility hypothesis (Wu *et al.*, 2019), which suggests that concentration leads to credit rationing, inefficiencies, huge credit losses and high interest charges, it is anticipated that these would reduce the stability of banks. Likewise, following the global advantage hypothesis (Kusi *et al.*, 2021), which suggest that foreign bank assets and presence leads to improved competition and risk management techniques, it is anticipated that foreign banks assets and presence should promote banking financial stability.

Inflation and gross domestic product growth rate are used as proxies for the economic stability and economic growth, respectively. Inflation is measured using consumer price index, while gross domestic product growth rate is computed as year-on-year changes in gross domestic product. Following prior literature inflation weakens the purchasing power of economic agents, including banks and leads to reduced stability of banks (Akram and Eitrheim, 2008). On the contrary, gross domestic product growth depicts improvement in economic income, which should translate into improved economic conditions and enhance loan repayment and reduce credit losses and risk (Jiménez *et al.*, 2009; Rajan and Dhal, 2003). Hence, gross domestic product growth rate is expected to promote banking stability. Finally, the regulatory structure is captured using Kaufmann *et al.* (2011) measure of institutional quality. Following the institutional theory (Kusi *et al.*, 2021), it is clear that institutions are instituted to design, develop and implement regulations that promote public interest. Hence, the quality of institutions should translate into improving bank financial stability (Table 3).

Empirical results and discussions

This section presents the key results of the study. However, the descriptive statistics reported in Table 4 are used to screen for outliers. While outliers are argued to influence the quality and accuracy of the results (Wilks, 1963), observation of the mean, minimum, maximum and standard deviation values provides no evidence of outliers. In Table 5, the pairwise correlation is used to screen for multicollinearity (Daoud, 2017; Haitovsky, 1969). However, following a multicollinearity threshold of 0.7 (Kennedy, 2008), there is no evidence of multicollinearity. Additionally, year effect, country effects and regional effects are controlled for to ensure reliability, consistency and accuracy of the results.

The main results of the study are reported in Tables 6 and 7. Table 6 presents five models, while Table 7 presents four models. In Table 6, Model 1 is the baseline model and does not account for the joint term of financial crisis and bank regulatory capital, year, country, regional effects. In Model 2, the joint term of financial crisis and bank regulatory

Symbols	Names	Measurements	Expected signs	Sources
FINSTAB	Bank financial stability	[capital-asset + ROA]/ standard deviation ROA		Global Financial Development
REGCAP	Capital regulation	[Tier 1 plus Tier 2 capital]/ risk-adjusted assets	+	Global Financial Development
PrST	Private sector financial sector transparency	Percentage of adult population covered by private bureaus	–	World Development Indicators
PuST	Public sector financial sector transparency	Percentage of adult population covered by public registries	–	World Development Indicators
PROFIT	Profitability	[Interest income - interest expense]/total assets	+	Global Financial Development
BANKDIV	Diversification	Non-interest income/total income		Global Financial Development
LERNER	Market power	[Price-marginal cost]/price	+/–	Global Financial Development
BANK-CON	Bank concentration	Total assets of largest three banks/total industry assets	–	Global Financial Development
FBP	Foreign bank presence	number of foreign banks/ total number of banks	+	Global Financial Development
INFL	Inflation	Consumer price index	+/–	World Development Indicators
FINCRISES	2007–2009 global financial crises	Dummy which assumes a value of 1 for years 2007, 2008 and 2009, and 0 otherwise	–	Capture Author Following Goddard *et al.* (2009)
GDPG	Gross domestic product growth	[Current GDP-previous GDP]/previous GDP	+	World Development Indicators
INSTIQUA	Institutional quality	Average of all Kaufmann *et al.* (2011) measures of institutional quality	+	World Governance Indicators

Table 3. Summary of variables used

capital is controlled for, while in Model 3, the joint term of financial crisis and bank regulatory capital and year effects are controlled for. In Model 4, the joint term of financial crisis and bank regulatory capital, year and country effects are controlled for, while in Model 5, the joint term of financial crisis and bank regulatory capital, year, country and regional effects are controlled for. In Table 7, the effect of financial crisis on financial stability at varied levels of bank regulatory capital are examined and reported. For instance, in Model 6, the effect of financial crisis on financial stability in economies with strong and weak bank regulatory capital are reported. In Models 7, 8 and 9, the effect of financial crisis is examined on financial stability under high and low bank regulatory capital.

From the results, financial stability is highly persistent, implying that the current level of financial stability is dependent or hinged on the previous year financial stability. Clearly, the financial stability of banks is not strictly determined by just current year events or factors. Similarly, financial crisis is found to negatively influence financial stability in the short (Models 1–5) and long run (Appendix 2) as expected. This finding implies that financial crisis periods have dampening or reducing effect financial stability observed in both the short and long run compared to non-financial crisis periods. Specifically, financial crisis-related events such as reduced bank client trust and increased bank panic withdrawals stifle

Variable	Obs	Mean	SD	Min	Max
FINSTAB	3,716	2.376	0.727	–4.11	4.557
REGCAP	2,023	16.572	5.418	1.755	48.6
PRFST	2,418	23.133	34.134	0	100
PUFST	2,418	8.065	17.222	0	100
PROFIT	3,631	4.799	3.088	0.032	23.32
BANKDIV	3,325	38.878	14.977	1.425	93.701
BANKCON	3,143	70.474	20.081	18.39	100
FBP	2,618	35.91	27.214	0	100
LERNER	2,353	0.265	0.157	–1.609	1.534
INFL	4,498	7.39	11.346	–18.109	98.773
FINCRISES	5,778	0.074	0.262	0	1
GDPG	5,334	3.592	5.97	–64.047	88.958
INSTIQUA	3,736	−0.025	0.935	–2.561	2.049

Notes: Significance levels: ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$ – values are in percentages – BANKSTAB: banking stability; PUBLIC-TRANS: financial sector transparency led by public sector; PRIVATE-TRANS: financial sector transparency led by private sector; BANKMARGIN: bank profitability; LERNER: bank market power; BANKCAP: bank capital requirement; BANKDIV: bank diversification; BANKCON: bank concentration; FOREIGNBANKS: foreign bank presence; INFL: inflation; FINCRISES: 2007–2009 financial crises; GDPG: economic welfare; INSTIQUA: institutional quality

Table 4.
Descriptive statistics

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
(1) FINSTAB	1.000												
(2) REGCAP	–0.013	1.000											
(3) PRFST	–0.055	–0.212	1.000										
(4) PUFST	0.048	–0.124	0.006	1.000									
(5) PROFIT	–0.057	0.375	–0.289	–0.135	1.000								
(6) BANKNON	–0.165	0.116	–0.024	–0.133	–0.108	1.000							
(7) BANKCON	–0.101	0.063	–0.117	–0.134	0.030	0.099	1.000						
(8) FBP	–0.058	0.164	–0.043	–0.049	0.122	0.020	–0.033	1.000					
(9) LERNER	0.205	0.192	–0.123	–0.069	0.139	–0.129	0.060	–0.001	1.000				
(10) INFL	–0.149	0.079	–0.190	–0.069	0.341	0.110	0.027	–0.111	–0.045	1.000			
(11) FINCRISES	–0.004	–0.067	–0.050	–0.080	0.016	0.014	0.000	0.085	0.033	0.022	1.000		
(12) GDPG	–0.016	0.051	–0.127	–0.062	0.090	0.043	–0.009	0.001	0.193	–0.011	0.067	1.000	
(13) INSTIQUA	0.143	–0.278	0.493	0.122	–0.515	–0.102	0.040	0.048	–0.152	–0.324	–0.002	–0.139	1.000

Notes: Significance levels: ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$ – values are in percentages – BANKSTAB: banking stability; PUBLIC-TRANS: financial sector transparency led by public sector; PRIVATE-TRANS: financial sector transparency led by private sector; BANKMARGIN: bank profitability; LERNER: bank market power; BANKCAP: bank capital requirement; BANKDIV: bank diversification; BANKCON: bank concentration; FOREIGNBANKS: foreign bank presence; INFL: inflation; FINCRISES: 2007–2009 financial crises; GDPG: economic welfare; INSTIQUA: institutional quality

Table 5.
Pairwise correlations

the financial stability of banks (Ozili, 2018; Crotty, 2009; Goddard *et al.*, 2009). On the contrary, the results in Table 6 show that international bank regulatory capital promotes financial stability of banks in the short (Models 2–5) and long run (Appendix 3), implying that maintaining minimum bank capital requirement is useful for promoting financial stability of banks in the short and long run. This result shows that international bank regulatory capital absorbs and deals with credit losses and unanticipated shocks (Ozili, 2018; Beck *et al.*, 2013; Diamond and Rajan, 2000), which improves the financial resilience of

Table 6.
Effect of financial crisis, capitalization and banking stability

Variables	1 Model 1	2 Model 2	3 Model 3	4 Model 4	5 Model 5
L.FINSTAB	0.566*** (0.170)	0.575*** (0.168)	0.573*** (0.174)	0.500** (0.195)	0.500** (0.195)
REGCAP	0.0111*** (0.00360)	0.00867*** (0.00315)	0.00930*** (0.00332)	0.00899** (0.00346)	0.00899** (0.00346)
FINCRISES	–0.0445*** (0.0169)	–0.133*** (0.0482)	–0.133*** (0.0482)	–0.142*** (0.0495)	–0.142*** (0.0495)
REGCAP#FINCRISES		0.00576* (0.00292)	0.00572* (0.00292)	0.00638** (0.00303)	0.00638** (0.00303)
PROFIT	0.0256* (0.0130)	0.0275** (0.0117)	0.0240* (0.0126)	0.0239** (0.0119)	0.0239** (0.0119)
PRFST	0.000788 (0.000563)	0.000893 (0.000580)	0.00108* (0.000630)	0.000973 (0.000685)	0.000973 (0.000686)
BANKDIV	0.00160 (0.00192)	0.00180 (0.00170)	0.00154 (0.00176)	0.00122 (0.00180)	0.00122 (0.00180)
BANKCON	0.000253 (0.00159)	8.70e–05 (0.00159)	–7.86e–05 (0.00158)	–0.000156 (0.00151)	–0.000156 (0.00151)
FBP	0.000842 (0.00152)	0.00109 (0.00135)	0.00135 (0.00149)	0.00134 (0.00150)	0.00134 (0.00150)
LERNER	0.115 (0.126)	0.119 (0.119)	0.141 (0.120)	0.162 (0.121)	0.162 (0.121)
INFL	–0.000653 (0.00163)	–0.000962 (0.00142)	–0.000566 (0.00147)	–0.000730 (0.00160)	–0.000730 (0.00160)
GDPG	0.0112** (0.00454)	0.00963** (0.00459)	0.0101** (0.00458)	0.0111** (0.00461)	0.0111** (0.00462)
INSTIQUA	0.0543 (0.0967)	0.0448 (0.0888)	0.0477 (0.0862)	0.0540 (0.0890)	0.0540 (0.0891)
PUFST	0.00137 (0.000855)	0.000842 (0.000805)	0.00109 (0.000851)	0.00104 (0.000942)	0.00104 (0.000942)
Constant	0.548 (0.402)	0.554 (0.417)	0.612 (0.427)	0.372 (0.737)	
Year effects	No	No	Yes	Yes	Yes
Country effects	No	No	No	Yes	Yes
Regional effect	No	No	No	No	Yes
Observations	696	696	696	696	696
Number of code	102	102	102	102	102
Instruments	21	21	22	22	22
F-stat	10.29 (0.00)	9.56 (0.00)	8.76 (0.00)	7.13 (0.00)	173.69 (0.00)
AR(1)	–3.02 (0.00)	–3.01 (0.00)	–2.99 (0.00)	–2.85 (0.00)	–2.85 (0.00)
AR(2)	–0.77 (0.44)	–0.90 (0.37)	–0.80 (0.42)	–0.78 (0.43)	–0.78 (0.43)
Hansen	5.99 (0.54)	2.29 (0.89)	2.26 (0.90)	1.88 (0.87)	1.88 (0.76)

Notes: Standard errors in parentheses; ***$p < 0.01$; **$p < 0.05$; *$p < 0.1$

Table 7.
Effects of financial crisis and non-crisis periods under different level of international bank capital requirements

Variables	(1) Model 6	(3) Model 7	(4) Model 8	(5) Model 9
L.lnzscore	1.037*** (0.206)	0.631*** (0.197)	0.631*** (0.197)	0.878*** (0.170)
FINCRISIS#SREGCAP	–0.185*** (0.0535)			
FINCRISIS#WREGCAP	–0.364*** (0.102)			
0B.HIGHCAP#1.FINCRISES		–0.0729*** (0.0173)		
1.HIGHCAP#0B.FINCRISES		0.0602** (0.0247)		
1.HIGHCAP#1.FINCRISES		0.0731*** (0.0276)		
0B.LOWCAP#1.FINCRISES			0.0129 (0.0275)	
1.LOWCAP#0B.FINCRISES			–0.0602** (0.0247)	
1.LOWCAP#1.FINCRISES			–0.133*** (0.0302)	
HIGHCAPCRISIS				–0.000739 (0.0262)
LOWCAPCRISIS				–0.0932*** (0.0218)
PROFIT	0.0214 (0.0177)	0.0306** (0.0142)	0.0306** (0.0142)	0.0275* (0.0150)
PRFST	0.000343 (0.000944)	0.000613 (0.000633)	0.000613 (0.000633)	0.000533 (0.000823)
BANKDIV	0.000746 (0.00280)	0.00250 (0.00185)	0.00250 (0.00185)	0.00132 (0.00245)
BANKCON	–0.00367 (0.00222)	0.00105 (0.00170)	0.00105 (0.00170)	–0.00272 (0.00203)
FBP	–0.00368 (0.00257)	0.00123 (0.00150)	0.00123 (0.00150)	–0.00148 (0.00185)
LERNER	0.229 (0.179)	0.109 (0.121)	0.109 (0.121)	0.234 (0.157)
INFL	0.00168 (0.00150)	–0.000816 (0.00105)	–0.000816 (0.00105)	–0.00102 (0.00135)
GDPG	0.00812* (0.00430)	0.00978** (0.00490)	0.00978** (0.00490)	0.00491 (0.00452)
INSTIQUA	–0.0510 (0.0918)	0.00532 (0.0959)	0.00532 (0.0959)	–0.0100 (0.0794)
PUFST	0.000387 (0.000921)	0.000933 (0.000760)	0.000933 (0.000760)	9.08e–05 (0.000921)
Year effects	Yes	Yes	Yes	Yes
Country effects	Yes	Yes	Yes	Yes
Regional effects	Yes	Yes	Yes	Yes
Observations	612	907	907	714
Number of ccode	120	120	120	120
Instruments	22	22	22	22
F-stat	99.97 (0.00)	913.29 (0.00)	884.96 (0.00)	542.24 (0.00)
AR(1)	–3.64 (0.00)	–3.01 (0.00)	–3.01 (0.00)	–4.01 (0.00)
AR(2)	–0.39 (0.70)	–1.30 (0.20)	–1.30 (0.20)	–1.04 (0.30)
Hansen	4.34 (0.50)	2.76 (0.43)	2.76 (0.43)	4.09 (0.54)
Z-Statistic	2.801***			

Notes: Standard errors in parentheses; ***$p < 0.01$; **$p < 0.05$; *$p < 0.1$

banks. In the case of assessing how financial crisis affects financial stability in the presence of international bank regulatory capital, it is observed that the joint term of financial crisis and international bank regulatory capital exhibits short-run (Models 2–5) and long-run (Appendix 4) synergetic-complement effect on financial stability, implying that the joint term of financial crisis and international bank regulatory capital promotes financial stability. Using the net effect computation strategy of Brambor *et al.* (2006), as indicated in equation (7), it is observed that the negative effects of financial crisis on financial stability are lowered or reduced in the presence of international bank regulatory capital. As shown in Appendix 5, in the increasing presence of international bank regulatory capital, there is a consistent declining negative effect of financial crisis on financial stability. This finding confirms the importance of maintaining bank capital requirement (Ozili, 2018; Beck *et al.*, 2013; Diamond and Rajan, 2000) to ensure and secure financial stability during financial crisis periods.

Further analyses are reported in Table 7. For instance, in Model 6, it is observed that economies that maintain the minimum international bank regulatory capital of 10.5%, which as labeled as economies with strong international bank regulatory capital, report lower negative effect of financial crisis compared economies with weak international bank regulatory capital that maintain international bank regulatory capital below the agreed 10.5%. Similar results are obtained in Models 7 where economies that maintain high international bank regulatory capital above the sample period average of 16.57% reduced the repressing effect of financial crisis on financial stability compared to economies that do not maintain high international bank regulatory capital. In Models 8 and 9, there is evidence to show that economies that maintain lower international bank regulatory capital suffer in terms of maintaining financial stability under financial crisis periods. Evidently, the importance of maintaining minimum international capital requirement cannot be downplayed, especially during financial crisis periods. Clearly, the results support prior studies that show that bank capital requirements are of importance for enforcing banking stability and especially so in the financial crisis period (Barrell *et al.*, 2017; Sawabe, 2002).

In terms of control variables, it is observed that banking profitability is consistently and significantly related to bank stability. This finding supports prior studies (Dwumfour, 2017) that indicate profits improve the financial position of banks and hence improves their stability. Thus, profitability banks are more likely to be financially stable. Also, the result reports significant effect of private sector-led financial transparency on banking stability, implying that enhancing transparency through private sector institutions in the financial market promotes banking stability. It is argued by prior literature (Stiglitz and Weiss, 1981, 1986) that transparency in the financial market tends to reduce information asymmetry and its related adverse effects to promote banking outcomes such as financial stability. Finally, gross domestic product is found to be positively related to banking stability. Knowing that gross domestic growth rate is an economic welfare indicator (Jiménez *et al.*, 2009; Rajan and Dhal, 2003), improvement in it leads to improved loan payment and reduces credit losses and risks, which translates into enhanced financial stability of banks.

Conclusions, implications and policy recommendations

Financial crisis remains a global threat to the financial stability of financial institutions, including banks. As such, regulators and policymakers at international, regional and national levels seek to develop and design mechanisms that minimize or at best eliminate financial crisis. A typical example of such mechanism is the international bank regulatory capital requirement recommended by the Committee on Banking Supervision in BASEL I, II and III, which has the core aim of curbing financial crisis and improving banking stability

around the world. In this study, we provide evidence on how international bank regulatory capital affects how financial crisis (specifically 2007–2009 global financial crisis) affects financial stability of banks in 102 economies between 2006 and 2016.

Using a two-step dynamic GMM panel model, the results indicates that while financial crisis and international bank regulatory capital negatively and positively impact financial stability of banks, respectively, we observe that in the increasing presence of international bank regulatory capital the negative effect of financial crisis on financial stability of banks declines. Additionally, the results show that economies that maintain minimum international bank regulatory capital above 10.5% recommended by BASEL III are to reduce the significant negative effect of financial crisis on bank financial stability. Furthermore, it is observed that economies that maintained international bank regulatory capital below the sample period average international bank regulatory capital of 16.57% were less like to reduce the significant negative effect of financial crisis on financial stability of banks.

These findings imply that in as much as financial crisis can be injurious to the financial health of banks, regulatory and policymakers can rely on international bank regulatory capital requirements to avert the injurious effects of financial crisis on financial stability of banks. Clearly, while international capital regulatory requirements are necessary for reinforcing financial stability through financial crisis, bank managers who maintain international capital requirements above the 10.5% recommendation stand a better chance to taming the avert effect of financial crisis on financial stability of banks. Additionally, economies that have not full adopted the BASEL minimum capital requirement may have to do so, given its potential of dampening the adverse effect of financial crisis on financial stability of banks. For the purpose of future research direction, research should focus on possible threshold effects of regulatory capital requirements on financial stability to the extent to which requirements may yield desirable results on stability.

Notes

1. Economies with strong bank regulatory capital are those with their bank regulatory capital above or equal to 10.5% as required by BASEL III, while economies with weak bank regulatory capital are those with their bank regulatory capital below 10.5%.
2. Economies with high bank regulatory capital are classified as economies that have their bank regulatory capital above or equal to the sample period average bank regulatory capital of 16.57%, while economies with low bank regulatory capital are classified as economies that have their bank regulatory capital below the sample period average bank regulatory capital of 16.57%.

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Further reading

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Appendix 1

Table A1. Pairwise correlations

Variables	(1)	
(1) FINSTAB	1.000	
(2) L.FINSTAB	0.890 (0.000)	1.000

Appendix 2

_nl_1: (_b[FINCRISES])/(1 –_b[L1.FINSTAB])

Table A2. Long-run effect of financial crisis on financial stability

lnzscore	Coef	SE	*z*	*p* > z	[95% conf.	Interval]
_nl_1	–0.285	0.146	–1.950	0.051	–0.572	0.002

Appendix 3

_nl_1: (_b[REGCAP])/(1 –_b[L1.FINSTAB])

Table A3. Long-run effect of international bank regulatory capital on financial stability

lnzscore	Coef	SE	*z*	*p* > z	[95% conf.	Interval]
_nl_1	0.018	0.008	2.210	0.027	0.002	0.034

Appendix 4

_nl_1: (_b[REGCAP*FINCRISES])/(1 –_b[L1.FINSTAB])

Table A4. Joint long-run effect of financial crisis and international bank regulatory capital on financial stability

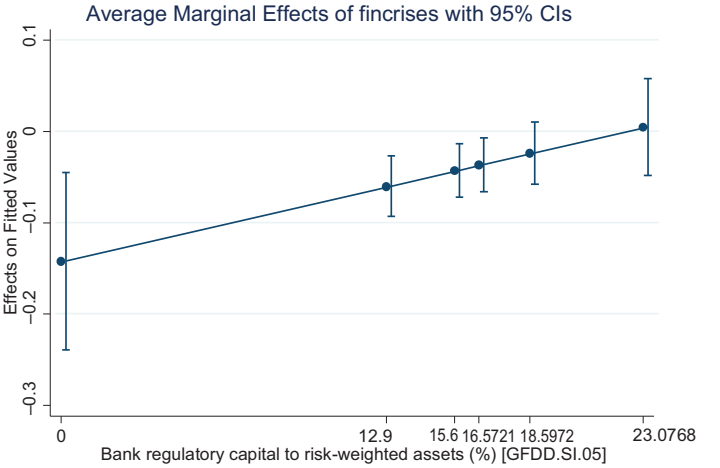
lnzscore	Coef	SE	*z*	*p* > z	[95% conf.	Interval]
_nl_1	0.018	0.008	2.210	0.027	0.002	0.034

Appendix 5. Net effect of financial crisis in the increasing presence of international bank regulatory capital

Warning: cannot perform check for estimable functions.
Average marginal effects Number of obs = 696
Model VCE : Corrected
Expression : Fitted Values, predict()
dy/dx w.r.t. : fincrises
1._at : bankregula~h = 0
fincrises = 1
2._at : bankregula~h = 12.9
fincrises = 1
3._at : bankregula~h = 15.6
fincrises = 1
4._at : bankregula~h = 16.57208
fincrises = 1
5._at : bankregula~h = 18.5972
fincrises = 1
6._at : bankregula~h = 23.0768
fincrises = 1

Delta-method

	dy/dx	Std.Err.	z	P>z	[95%Conf.	Interval]
fincrises						
_at						
1	−0.142	0.050	−2.880	0.004	−0.240	−0.045
2	−0.060	0.017	−3.550	0.000	−0.093	−0.027
3	−0.043	0.015	−2.900	0.004	−0.072	−0.014
4	−0.037	0.015	−2.430	0.015	−0.066	−0.007
5	−0.024	0.017	−1.370	0.169	−0.058	0.010
6	0.005	0.027	0.170	0.864	−0.048	0.058



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