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Contingent Capital: A Tool for Restoring Market Discipline?

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Abstract

Contingent capital is a new promising instrument that could provide banks with an expedited but potentially lower-cost private recapitalization mechanism in times of financial distress. This paper aims to examine the potential role of contingent capital in restoring market discipline and as a countercyclical capital buffer. A well designed contingent capital would help improve incentives for banks' risk management and enhance market monitoring which there by restoring market discipline in banking. Moreover, the use of contingent capital to build up capital in good times when system-wide risks are growing markedly would help banks to absorb potential losses and prevent a credit crunch in the economy in bad times. Using Thailand's experience over two different financial crises, namely the Thai financial crisis of 1997 - 1999 and the global financial crisis of 2007-2009, this paper provides empirical evidence supporting the use of a market-value capital ratio as a trigger for conversion of contingent capital, as well as the potential benefits of contingent capital as a countercyclical capitalbuffer to prevent future systemic crisis. Although the room for contingent capital instruments to satisfy the Basel new capital requirements might be limited, this paper also supports the use of the instruments on top of the Basel requirements.

Keywords: Contingent Capital, Market Discipline, Recapitalization, Countercyclical Capital

Introduction

Banking crises, through their fire-sale and credit crunch externalities, often have negative spillovers to the economy and require large bailout costs that weaken the countries' fiscal positions. The recent global financial crisis of 2007-2009 might be unique in its origin that emanated from the collapse in the subprime mortgage market—a consequence of using new financial innovations to mask risk on the financial system; but, was not unique in its end results of government bailouts of certain systemically important financial institutions and insolvent banks. Market expectation of public sector bailouts of the financial sector especially for the financial institutions that are perceived as too-big-to-fail (TBTF) has for a long time led to the so-called "moral hazard" problem and increased the incentive for excessive risk-taking which thereby weakening market discipline. The unprecedented level of government support to contain the recent global financial crisis has prompted a need for regulatory reform that could reduce moral hazard created by the implicit or explicit provision of government safety nets and limit taxpayer exposure to bailout risk.

As a consequence, a major attempt to avoid the use of taxpayer funds to recapitalize distressed banks in future crisis has been built into the new requirements, within a comprehensive set of regulatory reform measures in Basel III capital framework, that all regulatory capital instruments must be able to fully absorb losses at the point when a bank becomes non-viable (or the "gone-concern" loss absorbency).[1] One of the promising instruments that has a "bail-in" feature to recapitalize the problem banks and could also be used as an ex-ante measure to prevent bank failures is contingent capital. Contingent capital (also known as contingent convertibles or CoCos) is a long-term debt instrument that automatically converts into equity, or is write down, when a pre-determined trigger is breached at a time of financial distress, thereby helping to recapitalize the troubled financial institution at or before its insolvency. By enabling automatic conversion of debt to equity in times of financial distress, contingent capital would force the financial institutions to internalize their losses prior to any injection of public capital, thus providing a more effective solution to the moral hazard problems and restoring market discipline. Recent proposals advocate the use of contingent capital in the capital structure of major financial institutions to end the TBTF problem [see for example (Flannery 2005, 2009), (Squam Lake Working Group on Financial Regulation, 2009), (Calomiris and Herring, 2011)].

[1] See the Basel Committee on Banking Supervision (BCBS) press release "Final elements of the reforms to raise the quality of regulatory capital" on 13 January 2011 with its annex "Minimum requirements to ensure loss absorbency at the point of non-viability."

Contingent capital, when designed for early recapitalization well before bank insolvency (or on the "going-concern" basis), could also be used to meet the Basel Committee's requirements for additional loss absorbency beyond the minimum standards of the systemically important financial institutions to solve the TBTF and systemic risk problems. However, this issue is still ongoing.[2] The Basel Committee is conducting a study on the potential use of contingent capital as systemic surcharge for the global systemically important financial institutions; in particular, the magnitude of additional loss absorbency that the systemically important financial institutions should have and the extent of going-concern loss absorbency that the various proposed instruments could provide.

Moreover, a proposal from (De Martino et al., 2010) advocate the potential use of the going-concern contingent capital to meet the Basel Committee's implementation of countercyclical capital buffer which will be required on top of the capital conservation buffer to ensure that the banking sectors are resilient to the procyclicality in the financial system. However, whether contingent capital could have the potential role to meet the countercyclical buffer that will be used as one of the macroprudential tools to reduce the likelihood of systemic crises or play the possible role to reduce the banks' incentive for excessive risk taking that would help to restore market discipline, would depend on a design feature of the contingent capital instruments.

This paper aims to examine the role of contingent capital, focusing on its feasibility for restoring market discipline. Using the data from Thailand since the banking crisis in 1997, the paper tests how a regulatory trigger or a market-based trigger would have worked in the past, with a view to providing the supporting empirical evidence and drawing some policy implications for the design of contingent capital.

The rest of the paper is organized as follows. Section II discusses the potential role of contingent capital in reducing the likelihood of bank failures and future systemic

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[2] According to the revised version on 1 June 2011 of "Basel III: A global regulatory framework for more resilient banks and banking systems" published on 16 December 2010, the Basel Committee and the Financial Stability Board are in the process of developing an integrated approach to systemically important financial institutions which involves combinations of capital surcharges, contingent capital and bail-in debt. The work also covers broader issues on measures to mitigate systemic risk including liquidity surcharges, tighter large exposure restrictions and enhanced supervision and is expected to be released as consultative document in the first half of 2011. Then, on 19 July 2011, the Basel Committee issued a consultative document on "Global systemically important banks: Assessment methodology and the additional loss absorbency requirement" which specifies that the additional loss absorbency requirements for the global systemically important banks "are to be met with a progressive Common Equity Tier 1 (CET1) capital requirement ranging from 1% to 2.5%, depending on a bank's systemic importance". Thus, the use of contingent capital for additional loss absorbency requirements may be limited.

crises. Section III reviews some recent proposals for contingent capital. Section IV discusses different design features of contingent capital. Section V provides empirical evidence that could be used to develop the proposal on contingent capital. Section VI concludes and draws some policy implications.

I. The Role of Contingent Capital

The Basel Committee is reviewing the role that contingent capital should play in the regulatory capital framework. Whether contingent capital would be allowed within the minimum capital requirements, or be allowed to meet additional loss absorbency or a systemic capital surcharge for the systemically important financial institutions, or to meet the countercyclical buffer when there is a build-up of systemic risks remains uncertain.[3] This section discusses the potential role that contingent capital could play in reducing the banks' incentive for excessive risk-taking which thereby increasing market discipline and the role that contingent capital could play as a countercyclical buffer to prevent a systemic crisis.

A. Contingent Capital and Market Discipline

A number of proposals since the end of 1990s have recognized the importance of market discipline in maintaining the overall stability of the financial system and advocated the mandatory use of subordinated debt in bank capital regulation as a mechanism for enhancing market discipline in banking, (Evanoff and Wall, 2000). However, the disciplining force of subordinated debt has been shown to be limited during the recent global financial crisis of 2007-2009. In particular, public sector injections of capital and other government supports during the crisis have shown to limit the downside risk for the bank's uninsured and subordinated debt holders as well as shareholders. In this regard, bank's capital instruments, neither Tier 2 subordinated debt nor even Tier 1 hybrid securities and equity, although they would be used to bear losses in the case of bank's default, did not share losses in public sector bailouts and hence not provide meaningful loss absorption on the going-concern basis during the recent crisis.

Contingent capital, unlike the conventional form of subordinated debt, has additional characteristic of automatic conversion into equity in times of bank distress which would increase the going-concern loss absorbency for the banks. Hence, beyond

[3] On 19 July 2011, the Basel Committee issued a consultative document on the assessment methodology for global systemic importance and the magnitude of additional loss absorbency of the global systemically important banks concluding that the global systemically important banks be required to meet their additional loss absorbency requirement with Common Equity Tier 1 only. However, the Basel Committee will continue to review contingent capital and support the use of high-trigger contingent capital to enhance the going-concern loss absorbency higher than the global requirement.

using contingent capital to deal with the TBTF problem, there are also additional benefits that we can obtain from such instruments. This significant benefit is the enforcement of market discipline through the use of contingent capital instruments. The potential role that contingent capital would have on market discipline has urged the European Shadow Financial Regulatory Committee (ESFRC) to call for the Basel Committee to allow the issuance of contingent capital to be a more substantial part of bank's Tier 1 capital.

With the threat of losses from conversion that would result in dilution of existing shareholders, the issuance of contingent capital would help improve incentives for banks' risk management and enhance market discipline. In addition, the threat of future bank recapitalization that bondholders would also have to bear the costs when debt is converted to equity capital in times of distress would increase their incentives to exercise greater market discipline. In this regard, contingent capital could be considered as a valuable tool in promoting market discipline.

1. Incentives for Bank's Risk-Taking

An increasing number of academics have started to use a theoretical model to show the effect of the introduction of contingent capital into the bank's capital structure on reducing the shareholders' incentives for risk-shifting or the incentives to increase their risk-taking and thus lowering the probability of bank default, e.g. (Pennacchi, 2010), (Albul et al., 2010), (Pazarbasioglu et al., 2011), (Hilscher and Raviv, 2011).

(Pennacchi, 2010), (Albul et al., 2010) and (Hilscher and Raviv, 2011) present a structural model for analyzing contingent capital. They examine the risk-shifting incentives of banks that have contingent capital in their capital structure. (Pennacchi, 2010) uses a structural credit risk model of an individual bank whose market value of assets follows a jump-diffusion process or may suffer sudden losses as might occur during a financial crisis to explore the risk-taking incentives of the bank's shareholders when the bank issues different forms of contingent capital. While (Albul et al., 2010) present a model that integrates the tax shield benefit and bankruptcy cost effects of debt to analyze the impact of different contract terms of contingent capital on regulatory benefits, incentives for risk shifting and stock price manipulation. (Hilscher and Raviv, 2011) revise their pricing model to provide a closed form solution for the valuation of contingent capital and evaluate how the introduction of contingent capital into a bank's capital structure reduces the bank's default probability.

(Pennacchi, 2010) concludes that contingent capital may reduce a bank's moral hazard incentives and thus it would be a feasible and low-cost means of mitigating financial distress when its conversion threshold is set at a relatively high level of original shareholders' equity. (Albul et al., 2010) show that the introduction of contingent capital to substitute for issuing straight debt, not for equity,

in the bank's capital structure would reduce the incentive for asset substitution. Likewise, (Hilscher and Raviv, 2011) show that the design of contingent capital has important effects on the risk-taking incentive of shareholders. In particular, a well designed contingent capital can reduce shareholders' incentives to increase risk.

Moreover, (Hilscher and Raviv, 2011) also show that the introduction of a well designed contingent capital like compensation into the capital structure to replace the conventional equity based compensation can minimize the risk-taking motivation of the managers.

(Pazarbasioglu et al., 2011) developed a simple two-period model to illustrate the benefits of contingent capital in reducing the incentives for banks to take excessive risk by eliminating the government bailouts or reducing the probability of default. Their model implies that the effect of contingent capital on bank's risk-taking behavior is equivalent to the effect of a risk-based, pre-funded bank resolution fund or capital insurance fund on bank's risk-taking.

The results from these theoretical studies could have policy implications on contingent capital instruments that could be considered as a mechanism for enhancing market discipline in banking and maintaining financial stability due to its effect on reducing incentives for risk-taking by the bank's shareholders, bondholders and managers.

2. Market Monitoring[4]

In addition to the ex post private sector risk-bearing capacity that contingent capital would provide in times of distress when automatic conversion from debt into equity occurs, it would also provide useful ex-ante price signals on bank riskiness, (Stepphanou, 2010) and (Calomiris and Herring, 2011). As investors in contingent capital instruments would be exposed to the consequences of excessive risk taking and have to share losses for public bailouts from conversion to equity, they would have strong incentives to strengthen the risk monitoring of the bank and to discipline the bank by requiring more capital or demanding adequate compensation for the risks they assume. Accordingly, the market price of contingent capital "would provide regulators with a valuable signal about the financial health of the firm and about the market's perception of systemic risk" as stated in (Plosser, 2010). This benefit would

[4] (Bliss and Flannery, 2000) define two important aspects of market discipline: market monitoring and market influence. They define that "market monitoring refers to the hypothesis that investors accurately understand changes in a firm's condition and incorporate those assessments promptly into the firm's security prices." Thus, "monitoring generates the market signals to which managers are thought to respond". Meanwhile, market influence is defined as "the process by which a security price change engenders firm (manager) responses to counteract adverse changes in firm condition". Their proposed definition of market discipline "requires that incentives translate into desired managerial actions".

be better realized if contingent capital instruments are actively and transparently traded in the market, (Furstenberg, 2011). Hence, contingent capital would be a useful tool for enhancing both regulatory supervision and market discipline [see (Plosser, 2010) and (Basel Committee on Banking Supervision, 2010b)].

Moreover, the effects of contingent capital on enhancing market discipline i.e. enhancing market monitoring and controlling shareholders' risk taking, in tandem with other policy issues as its effects on preventing costly failures in banking, reducing the cost of deposits insurance, reducing the value of bankruptcy costs, are quantitatively evaluated and compared with those of the subordinated debt in the previous theoretical study of (Raviv, 2004).[5] Using a contingent claims valuation approach in the analysis, the results from (Raviv, 2004) imply that contingent capital would be an efficient tool for enhancing market stability and bank efficiency as it helps reduce the value of bankruptcy costs. In particular, the results regarding the effects on market monitoring show that contingent capital can enhance market monitoring due to its negative sensitivity to increase in asset risk i.e. an increase in leverage ratio or assets' volatility.

B. Contingent Capital and Countercyclical Buffer

The financial crises showed that losses incurred in the banking sector following a period of excessive credit growth could have a destabilizing effect on the whole financial system and result in a downturn in the real economy that could further have a negative feedback on the banking sector. In this regard, the Basel Committee realized the needs for the banking sector to build up its additional capital buffers in periods of excessive credit growth that would generally be associated with a build-up of system-wide risk [see (Basel Committee on Banking Supervision, 2011a)]. Then, as one of the measures in the Basel III capital framework, countercyclical buffer will be required to address procyclicality and protect the banking sector in periods of excessive credit growth. The Basel Committee requires that banks must meet this countercyclical buffer with "Common Equity Tier 1 or other fully loss absorbing capital" otherwise banks will be subject to the restrictions on

[5] (Raviv, 2004) proposes a financial instrument called "Debt-for-Equity Swap" contract which has the same mechanism of automatic conversion into equity when the value of the bank's assets falls below a predetermined threshold as recently proposed with the contingent capital instruments.

distributions of earnings.[6]

With automatic conversion from debt into equity in times of financial distress, contingent capital instruments would meet the Basel Committee's requirement for fully loss absorbing capital to meet all or part of the countercyclical capital buffer. In this regard, (De Martino et al., 2010) advocate the potential use of contingent capital instruments for covering the banks' capital needs that will arise from the implementation of countercyclical buffers.

As an alternative to common equity, banks may issue contingent capital during good times to build up their capital buffer, and in bad times such contingent capital instruments would be converted into equity capital; thereby, providing banks with sufficient capital to support their lending activities. With this countercyclical character, contingent capital could then be considered as an instrument for ensuring that banks would have adequate capital buffer to protect them against future potential losses as well as for avoiding a credit crunch in the real sector as advocated in (De Martino et al., 2010).

Moreover, the (Shadow Financial Regulatory Committee, 2010) also highlights some countercyclical properties of the contingent capital proposed based on a market value trigger using a quasi market value of equity ratio[7] for its conversion trigger as

[6] According to the (Basel Committee on Banking Supervision, 2011a), the Basel Committee imposes restrictions on capital distribution including the reduction in dividend payments, share buybacks and staff bonus payments when the banks' capital levels fall into the range below the minimum capital conservation standards as specified in the table below, if banks are subject to a 2.5% capital conservation buffer and an additional 2.5% countercyclical buffer requirements. For example, a bank with Common Equity Tier 1 capital ratio in the range of 5.75% to 7.0% is required to conserve 80% of its earnings in the subsequent financial year, or more generally to payout no more than 20% in terms of dividends, share buybacks and staff bonus payments.

Individual bank minimum capital conservation standards, when a bank is subjected to a 2.5% countercyclical requirement	
Common Equity Tier 1 Ratio (including other fully loss absorbing capital)	Minimum Capital Conservation Ratios (expressed as a percentage of earnings)
4.5% - 5.75%	100%
> 5.75% - 7.0%	80%
> 7.0% - 8.25%	60%
> 8.25% - 9.5%	40%
> 9.5%	0%

[7] (Calomiris and Herring, 2011) define a quasi market value of equity ratio as "the ratio of the market value of equity relative to the sum of the market value of equity plus the face value of debt."

suggested in the proposal by (Calomiris and Herring, 2011). As the conversion for the contingent capital in their proposal is specified as the ratio of the quasi market value of assets, the (Shadow Financial Regulatory Committee, 2010) states that "it will rise during booms, thus slowing the rate of lending and fall during busts, thus offsetting to some extent the pressures from rising risk-based capital requirements that discourage additional lending." Hence, with the countercyclical character of contingent capital, banks could issue contingent capital instrument in good times and used as a hedge against future needs of capital in bad times. The build-up of capital buffer in good times would then have additional benefit of helping to moderate excessive credit growth which thereby reducing a likelihood of systemic crisis.

II. A Review of Proposals on Contingent Capital

Proposals for contingent capital are currently gaining more regulatory importance. This section reviews some major proposals on contingent capital instruments both from regulators and academic literatures.

A. Bank Regulator

The Group of Central Bank Governors and Heads of Supervision and the Basel Committee on Banking Supervision will support the use of going-concern contingent capital "to meet higher national loss absorbency requirements than the global minimum" and continue to review the scope for the use of contingent capital in bank capital regulations.[8] Moreover, the Dodd-Frank Act mandates the Financial Stability Oversight Council to study "the feasibility, benefits, costs, and structure of a contingent capital requirement" and submit the report within 2 years, i.e. by the mid of 2012.[9]

The Basel Committee issued minimum requirements for the capital instruments to be included in additional Tier 1 or in Tier 2 capital must have a provision in their terms and conditions "that requires such instruments, at the option of the relevant authority, to either be written off or converted into common equity upon the occurrence of the trigger event."[10] The trigger event is the earlier of the decisions determined by the relevant authority (1) that the firm would become non-viable without a write-off; and (2) that the firm would have become non-viable without

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[8] See the Basel Committee's press release dated 25 June 2011 on "Measures for global systemically important banks agreed by the Group of Governors and Heads of Supervision."

[9] Financial Stability Oversight Council. 2011. "Study of the effects of size and complexity of financial institutions on capital market efficiency and economic growth." January.

[10] See the Basel Committee's press release dated 13 January 2011 on "Basel Committee issues final elements of the reforms to raise the quality of regulatory capital."

a public sector injection of capital, or equivalent support. These minimum requirements were set "to ensure that all classes of capital instruments fully absorb losses at the point of non-viability before taxpayers are exposed to loss." All new Tier 1 and Tier 2 instruments issued on or after 1 January 2013 must have equity conversion clauses or permanent write-offs to be included in regulatory capital. As a result, most existing hybrid and subordinated debt instruments with over 1 trillion US dollars outstanding will not qualify as regulatory capital under Basel III framework after 1 January 2013 and will have to be phased out over 10 years by 2022 [see (Pazarbasioglu et al., 2011)]. Accordingly, banks may have to issue loss-absorbing instruments in coming years to replace the existing capital instruments that no longer eligible as regulatory capital. It is estimated that the market for contingent capital must be large enough to absorb potential issuance of at least 925 billion US dollars over the next decade [see (Pitt et al., 2011)]. However, for contingent capital instruments to qualify as additional Tier 1 or Tier 2 capital, they must meet the standards set out by the Basel Committee.[11]

Apart from the loss-absorbing capacity when the bank is determined to be no longer viable, contingent capital could also be used to meet the requirements in the Basel III capital framework for additional loss-absorbing capital. In particular, contingent capital instruments could be used to meet additional loss absorbency or capital surcharge for the systemically important financial institutions as advocated in several proposals, e.g. (Flannery, 2009) or used as a countercyclical buffer to mitigate procyclicality and prevent a systemic crisis as advocated in (De Martino et al., 2010).

The Swiss authorities have been the first national regulators to specify regulatory capital requirements for contingent capital instruments as a part of the Swiss systemically important financial institutions (SIFI) policy framework to mitigate risks emerging from the TBTF financial institutions [see (Swiss Financial Market Supervisory Authority – FINMA, 2011)].[12] The Swiss proposed a higher regulatory capital requirement for the Swiss SIFI with a total capital requirement of 19% of risk weighted assets, of which at least 10% of risk weighted assets have to be held in common equity and a further 9% of risk weighted assets may be held in the form of contingent capital.

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[11] Basel Committee on Banking Supervision, 2011a, "Basel III: A global regulatory framework for more resilient banks and banking systems," (rev June).

[12] On 4 October 2010, the commission of experts from The Swiss Federal Government, the Swiss Financial Market Supervisory Authority (FINMA) and the Swiss National Bank, agreed on a proposal for a Swiss SIFI policy framework towards measures for strengthening the resilience of the Swiss SIFIs, limiting the economic impact of crisis in the financial system and promoting financial stability.

In particular, the Swiss will impose a capital conservation buffer as additional loss absorbency of 8.5% of the bank's risk weighted assets on top of the Basel III minimum capital requirements for all banks of 4.5% of risk weighted assets. A maximum of 3% of the risk weighted assets of the additional capital conservation buffer may consist of contingent capital with high-level triggers forcing conversion when the bank's common equity tier 1 capital ratio falls below 7%. The high-level trigger contingent capital helps recapitalize the bank when its capital is deteriorating, thus improving the bank's loss absorbing capacity, stabilizing the bank before restructuring measures become necessary and leading to further recovery. In addition, a progressive systemic surcharge is also proposed for additional solvency of the bank with high systemic importance. This progressive systemic surcharge will result in additional capital requirements for 6% of the risk weighted assets which will include only contingent capital with low-level triggers. The low-level trigger contingent capital will convert at a common equity tier 1 capital ratio of 5%, just before the bank's capital falls below the minimum requirements. The low-trigger contingent capital provides additional recapitalization in crisis management to prevent the bank from being put into receivership and, in a worst-case scenario, provide funds for an orderly bank resolution.

B. Academic Literature

All proposals on contingent capital aim to use the mechanism of this new hybrid security to expedite private recapitalization of distressed banks at no cost to taxpayers and without distorting the ex-ante incentives of private investors to monitor and discipline large banks, though they may have different designs on the trigger conditions and the conversion rate.

(Flannery, 2005, 2009) proposes a new capital instrument, "reverse convertible debentures" or what recently called in his seminal work as "contingent capital certificates", as a mechanism to stabilize large financial institutions. This instrument automatically converts from debt to equity depending on the issuer bank's own financial condition when the bank's market value of capital ratio falls below some pre-specified level. The studies propose that the instrument should be converted at the current market price of common equity on the conversion day in order to force bank shareholders to internalize the full costs of their risk-taking decisions. (Flannery, 2009) suggests that contingent capital instrument would add to the bank's risk-bearing capacity in bad times without burdening the bank with tax-inefficient equity financing in good times. Thus, incorporating contingent capital into the capital structure of systemically important banks would "reduce the probability of failure, reduce the incentive to move safer activities off balance sheet, protect taxpayers and solvent banks from bearing the issuer's losses, and still permit the issuers' to lend profitably

at relatively low rates of interest."

On the contrary, (Squam Lake Working Group on Financial Regulation, 2009) proposes a new regulatory hybrid security, i.e. contingent capital that will expedite the recapitalization of distressed banks during a systemic crisis. In particular, contingent capital instruments will convert from debt to equity if (1) the regulators declare that the financial system is suffering from a systemic crisis; and (2) the bank violates the covenants in the hybrid-security contract (i.e. a bank-specific variable, such as the ratio of Tier 1 capital to risk-adjusted assets, is triggered). The Squam Lake Working Group proposes conversion when both the financial system and the issuing bank are under financial distress for two reasons. First, the new hybrid security will provide the same benefit of disciplining force for bank management like debt except in the most extreme periods. Second, the bank-specific triggers help ensure that sound banks will not be forced to convert their debt to equity during a crisis, thus enhancing the incentive for the banks to remain sound. Their proposal also suggests that the conversion rate for this new hybrid instruments should be "to convert each dollar of debt into a fixed quantity of equity shares, rather than a fixed value of equity" in order to avoid "death spiral"[13] problem that may arise from conversion based on stock price.

(Calomiris and Herring, 2011) also develop a proposal for a contingent capital requirement for prudential purpose. They advocate that contingent capital would be an effective tool for addressing two incentive problems: ex-ante risk mismeasurement and mismanagement, and ex post failure for timely replacement of lost equity capital. In particular, a well designed requirement for contingent capital for systemically important banks can provide incentives that will motivate the banks to have an effective framework for risk governance to measure and manage risk properly and to raise new equity capital or sell assets on a timely basis. With an emphasis on the role of contingent capital in incentivizing the prompt voluntary issuance of equity into the market long before the banks experience significant losses of equity, (Calomiris and Herring, 2011) propose that a large amount of contingent capital, i.e. 10% of the ratio of book equity relative to book assets, should be required. This is commensurate with the Swiss proposal for mandatory capital requirements for the Swiss SIFI of 9% of risk weighted assets in the form of contingent capital required on top of the common equity capital of 10% of risk weighted assets, and the capital requirements for systemically important banks under Basel III framework for common equity tier 1 capital ratio of 9.5% of risk weighted assets. Regarding the conversion trigger for

[13] "Death spiral" refers to a situation in which the risk of dilution of the existing shareholders may further lower the stock price, leading to more dilution that lowers the stock price even further.

contingent capital, they propose an 8% quasi market value of equity ratio based on a 90-day moving average as an appropriate trigger. In addition, they suggest that all contingent capital instruments should convert if conversion is triggered and the bank should be required to reissue new contingent capital into the market to replace the converted contingent capital within one year. Moreover, a conversion ratio should be 5% dilutive of shareholders relative to face value in order to ensure adequate dilution risk to preexisting shareholders.

Calomiris and Herring's proposal resembles the proposal advocated by Flannery in two important ways. First, a conversion for contingent capital instrument would be based on a bank specific, market value trigger. Second, the conversion ratio would be determined to create substantial dilution risk for the bank's existing shareholders.

(Coffee, 2011) proposes the use of contingent capital as an instrument to build loss absorbency into the capital structure of the systemically important financial institutions. However, unlike most proposals for contingent capital, (Coffee, 2011) proposes different design for contingent capital to curb shareholder pressure for greater risk and leverage. Specifically, Coffee's proposal recommends contingent capital with multiple incremental conversions instead of a massive, one-time conversion in order to reduce market shock. For example, 25% of contingent capital might be converted with a 25% decline in stock price from the price on issuance date of contingent capital; another 25% might convert if stock price declined by 50%; and the remaining balance would convert if stock price fell by 75%. More importantly, the proposed contingent capital would convert from debt into a preferred stock with cumulative dividends and voting rights, not a common stock, to create a class of rationally risk averse, voting preferred shareholders to counterbalance risk-tolerant common shareholders for increased leverage and risk taking. Moreover, the amount of contingent capital that a systemically important financial institution should be required to issue should be determined in relative to its short-term liabilities and in sufficient amount to alleviate short-term creditors' fear of bank insolvency.

III. Design Issues of Contingent Capital

Proposals that advocate the promising role of contingent capital in the capital structure of systemically important banks are increasing in number; however, the optimal design for contingent capital is still debatable. This section discusses different design features in various proposals.

A. Purpose

Appropriate design features for contingent capital significantly depend on the main objective for which contingent capital instruments would be set. Contingent capital may serve as a resolution tool on the gone-concern basis to absorb losses when

a bank is at the point of non-viability or insolvency; or, as a preventive tool to absorb losses while a bank remains on a going-concern in order to limit the prospect of systemic crises. Moreover, contingent capital may serve as a policy instrument to limit idiosyncratic risk or the failure of individual financial institutions to achieve micro-prudential stability; or, to mitigate systemic risk or the failure of the financial system as a whole to gain macro-prudential stability. In addition, contingent capital may provide a credible market signal of bank's default risk which could be used to complement bank supervision. However, with possible different focus on various objectives, proposals for contingent capital share the common goal of providing a distressed bank with loss-absorbing capital during the financial crisis.

1. Going-Concern and Gone-Concern Contingent Capital

Like the bail-in proposals[14], a gone-concern contingent capital is designed to absorb losses when a bank is at or near its insolvency in order to facilitate a more orderly liquidation of assets. The gone-concern contingent capital is a resolution tool used to ensure private sector involvement in the bank restructuring process. In essence, it is a new instrument that would replace exiting hybrid capital securities that failed to absorb losses during the past crises.

Moreover, the benefit of contingent capital for loss absorption is much enhanced when it is designed to provide additional loss-absorbency for a distressed bank on a going-concern basis when losses are still limited and well before any bank resolution mechanism becomes necessary. This going-concern contingent capital has received great supports for its inclusion in the capital structure of systemically important banks to provide higher capital buffers and additional loss-absorbing capacity for the banks with deteriorating financial conditions or with a threat of failure. In this regard, a going-concern contingent capital would help stabilize the situation for a distressed bank and limit the prospect of systemic crisis.

In addition, early recapitalization resulting from the going-concern contingent capital could force threat of change in control of the bank from existing shareholders to the holders of contingent capital. In this sense, the bank will de-risk and de-leverage as problems begin to emerge. Thus, the going-concern contingent capital could help strengthen market discipline and be an effective risk-mitigating tool [see (Pitt et al., 2011)].

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[14] Bail-in proposals represent a statutory approach to debt write-downs or debt-equity conversion of unsecured debts. Unlike contingent capital instruments which are an ex-ante precautionary measure implemented as part of early rescue package and based on automatic triggers for conversion, bail-ins are ex post measure implemented in the course of debt restructuring and based on the supervisors' discretionary power to recapitalize an insolvent bank.

2. Micro-Prudential and Macro-Prudential Policy Objectives

During the pre-crisis, financial regulation had focused mostly on bank-specific or micro-prudential risks for assuring safe and sound banking system. However, the recent systemic financial crisis that resulted in global recession has led to major regulatory reform with more focus on systemic risk. Accordingly, the post-crisis financial regulation focuses on a macro-prudential component to complement the micro-prudential orientation of the capital requirements. Specifically, contingent capital instruments could be designed to serve both the micro-prudential and the macro-prudential policy objectives of financial regulations.

Depending on specific design features for conversion of the instrument, contingent capital could be used to limit idiosyncratic risk of individual systemically important banks whose failures could result in the widespread systemic risks as advocated in several proposals, e.g. (Flannery, 2005, 2009) and (Calomiris and Herring, 2011); or to reduce systemic risks during the financial crises as proposed in (Squam Lake Working Group on Financial Regulation, 2009). Moreover, as proposed in (De Martino et al., 2010), contingent capital could also be used to meet the requirements for countercyclical buffers which operate as an instrument for pursuing the macro-prudential objectives during a systemic crisis.

B. Conversion Trigger

The effectiveness of contingent capital instruments for achieving specific objectives discussed earlier depends significantly on the specific features of the contract, especially the conversion triggers and the conversion rates of the instruments. Moreover, the threshold level for conversion trigger is also critical for the contingent capital instruments to achieve the desired objectives. Specifically, contingent capitals with low-level triggers that convert at or near to a point of bank insolvency would be the design features for the gone-concern contingent capitals that could be used as a tool for an orderly resolution of a failing bank. On the contrary, contingent capital instruments with conversion triggers set at a high level well before a bank becomes insolvent would be the important characteristics of the going-concern contingent capitals that could be used as a tool for crisis prevention, i.e. to mitigate bank's risk-taking and reduce systemic risks. The following subsection discusses what type of trigger(s) could be used for conversion from debt into equity to achieve the desired results from contingent capital instruments.

1. Systemic and Bank-Specific Conversion Triggers

Systemic triggers or macro-triggers are the triggers that determine whether and when the debt converts into equity which are based on the condition of the financial

system as a whole. Possible systemic triggers could include indicators such as aggregate bank returns or losses, market volatility index, or regulators' declaration of a systemic crisis. Contingent capitals with systemic triggers would allow the regulators to build into the financial system a capital cushion that could be used in time of financial distress, and be more efficient in mitigating systemic risks [see (Pazarbasioglu et al., 2011)]. However, providing recapitalization across the banking system would undermine a bank's incentive for individual risk management and weaken market discipline.

Bank-specific triggers or micro-triggers are the triggers for conversion from debt into equity based on the financial condition of an individual bank. Variables for bank-specific triggers could include a bank's capital ratio, share price or credit default swap (CDS) spread, regulators' decision on a bank's non-viability. Contingent capital instruments with bank-specific triggers would help reduce idiosyncratic risks, especially of a systemically important bank whose failure would induce a systemic crisis, and also enhance the role of market discipline in micro-prudential regulation to limit bank's incentive for excessive risk-taking and promote clearer market signals of bank riskiness [see (Flannery, 2009) and (Stepphanou, 2010)].

2. Market-, Regulatory Capital-, and Supervisory Discretion-Based Triggers

Designing appropriate conversion trigger(s), given a conversion rate, for contingent capital is crucial as it will affect the price of and the demand for such instrument, and ultimately the viability of contingent capital as a private solution to the problems arising from the banking sector.

Several proposals advocate the use for market-based triggers for conversion. For example, they propose indicators such as market value of capital ratio [e.g., (Flannery, 2005, 2009), (Pennacchi, 2010) and (Calomiris and Herring, 2011)], and share price or CDS price [e.g., (Hart and Zingales, 2009), (McDonald, 2010) and (Coffee, 2011)]. Contingent capitals with market-based triggers would facilitate prompt and transparent recapitalization in relative to regulatory capital- and supervisory discretion-based triggers. Triggers based on the market value compared with the balance sheets or accounting value may tend to accurately reflect the financial health of the banks and be more forward-looking, thus providing early warning signal of bank risk. However, such market-based triggers can be subject to excess market volatility or market manipulation and result in conversions not truly justified by the bank's underlying financial position. These concerns, nevertheless, can be alleviated by setting the triggers based on average market prices over a given time interval [e.g. see (Flannery, 2009) and (Calomiris and Herring, 2011)]; or, as suggested by (Coffee, 2011), by setting the triggers based on CDS spread rather than stock price levels, or setting a dual price trigger for conversion in order to make the market manipulation less possible since the manipulation of the stock price of the financial industry as a whole is

more challenging.

Accounting-based triggers, or more generally capital-ratio based triggers, would force mandatory conversion when a bank's total regulatory capital or Tier 1 capital ratio falls below a pre-specified level. Capital-based triggers remove the vulnerability to market manipulation and seem to align better with the regulatory capital framework as the holders of contingent capital and shareholders have the incentives to avoid letting bank capital falls near the trigger point. Consistent with the Swiss requirement for contingent capital as a part of the Swiss SIFI policy framework, the contingent capital-like securities issued to date largely use regulatory capital ratio as trigger for loss-absorption.[15] However, reported regulatory capital ratios tend to be lagging indicators of the banks' actual financial conditions that may be too slow to force recapitalization sufficiently early while the banks are still viable.

Apart from market- and regulatory capital-based triggers advocated in various proposals, regulators tend to favor triggers based on supervisory discretion. This kind of trigger provides regulators with flexibility and discretion to respond to crisis. Regulators usually believe that they have more insight on the financial conditions of the banks they regulate and make decisions taking into consideration the systemic stability of the financial system as a whole. The Basel Committee's proposal to ensure fully loss-absorbency capital allows capital instruments with supervisory discretion-based triggers, or more specifically trigger event based on regulator's decision on a bank's non-viability as eligible for the minimum requirements for additional Tier 1 and Tier 2 capital. Moreover, the Squam Lake Working Group also proposes a supervisory declaration of a systemic crisis together with a bank-specific variable like Tier 1 capital ratio as double triggers for conversion. However, supervisory discretion-based triggers are opaque and tend to lead to regulatory forbearance. This is because regulators may be more concerned on maintaining confidence in the financial markets and then hesitate to announce that a bank is in distress or to declare the existence of a crisis during an early stage. As a consequence, contingent capitals with supervisory discretion-based triggers will convert into equity just before bankruptcy or an injection of public capital; thereby, increasing negative signaling problem [see (Pazarbasioglu et al., 2011)]. Due to the unpredictable conversion event of the supervisory discretionary triggers, it is difficult to price such contingent capitals and the funding costs for banks will increase.

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[15] For example, according to (Pazarbasioglu et al., 2011) and (Pitt et al., 2011), the first contingent capital-like security issued by Lloyds Banking Group as part of an exchange offer for Tier 1 and Tier 2 instrument holders in late 2009 after the bank had been intervened will force conversion into common equity if core Tier 1 capital ratio falls below 5% on certain dates.

3. Dual Trigger

To ensure that a distressed bank will be recapitalized during a systemic crisis, some proposals suggest a dual trigger comprising of both a systemic trigger and a bank-specific trigger for conversion into equity. Specifically, as discussed earlier, the Squam Lake Working Group proposes contingent capitals with a dual trigger of a supervisory declaration of systemic crisis and a bank-specific Tier 1 capital ratio as conversion triggers. In contrast, (McDonald, 2010) proposes a dual price trigger based on market-based indicators instead of relying on supervisory discretion and lagging indicator of regulatory capital ratio. In McDonald's proposal, contingent capitals would convert from debt into equity only when both a bank's own stock price and a financial sector index declined to or below predefined values. Moreover, (De Martino et al., 2010) also propose a double trigger for conversion in their proposal on the possible use of contingent capital to meet countercyclical capital buffer. In particular, they suggest a double trigger comprising of a bank-specific market-based indicator and a macro-trigger indicating distress in the financial system.[16]

Contingent capitals with dual trigger can provide a broad-based recapitalization for the banking system as a whole, while allowing for differentiation between sound and distressed banks. In addition, according to (Coffee, 2011), the use of a dual trigger for market-based indicators may reduce the prospect of price manipulation. However, if the systemic trigger is not activated, a dual trigger means that individual banks can become insolvent before conversion of contingent capital. There is also a risk for mixed signals on the severity of the financial system's distress.

C. Conversion Rate

A specific designed property of conversion ratio for contingent capital may have implications on incentives for risk shifting and stock price manipulation [e.g. see (Squam Lake Working Group on Financial Regulation, 2009), (Flannery, 2009), (Pennacchi, 2010), (Albul et al., 2010), and (Hilscher and Raviv, 2011)]. Specifically, the mechanism by which the bank shareholders will suffer the cost of increased risk taking depends largely on the conversion rate of contingent capital instruments. Thus, for the contingent capital instruments to be effective as a risk-mitigating tool that enhance market discipline, the conversion rates must appropriately be determined to ensure that there are no transfer of values between the bank shareholders and contingent capital holders [see (Sundaresan and Wang, 2010)]. Moreover, (Calomiris and Herring, 2011) suggest that the conversion ratio should be highly dilutive to the

[16] In (De Martino et al., 2010), a double trigger with a combination of a bank's two weeks abnormal return and a macro-trigger of GDP gap provides quite a good empirical evidence for appropriate trigger during the recent global financial crisis of 2007-2009.

preexisting shareholders to ensure the incentives for pre-emptive equity offerings. This is because the threat of loss in control of the bank will prompt shareholders and managers to de-risk or de-leverage their positions and if necessary to replace equity capital preemptively in order to prevent the triggering for conversion of contingent capitals.

However, according to (Basel Committee on Banking Supervision, 2011c) the benefits of increased market discipline of the going-concern contingent capitals relative to common equity depend on their conversion rate. Contingent capital instruments may provide an incentive for bank shareholders and managements to avoid excessive risk-taking when a sufficiently high number of new shares are created upon conversion of contingent capital to make the common shareholders suffer a loss from dilution. On the other hands, contingent capitals may provide an incentive for contingent capital holders to monitor the risks taken by the issuing bank, and also provide incremental information about market's perception of the bank's health if a sufficiently low number of shares are issued on conversion to make the contingent capital holders suffer a potential loss of principal associated with the conversion.

In addition, (Albul et al., 2010) also emphasize that the conversion rate of contingent capital should not motivate either shareholders or contingent capital holders to manipulate share prices. In particular, bank shareholders may have incentives to manipulate the bank's stock price to a lower value in order to force conversion of contingent capital into equity if the ratio of equity conversion value to the value of contingent capital is sufficiently low to make the shareholders profitable from conversion. On the contrary, contingent capital holders may have incentives to push the share price down if the ratio of equity conversion value to the value of contingent capital is sufficiently high to make them profitable from conversion.

Contingent capital with conversion into a fixed value of equity or an ex-post determined number of shares based on the par value of contingent capital divided by the issuing bank's share price at the time of conversion, may create large dilution risk for the existing shareholders that can deter ex-ante bank risk-taking. However, conversions based on the market value of the bank's equity shares may create incentives for market manipulation and lead to death spiral problem [see (Squam Lake Working Group on Financial Regulation, 2009)].

Therefore, the Squam Lake Working Group suggests contingent capital with conversion into a fixed number of shares or a predetermined number of shares based on the par value of contingent capital divided by the share price at the time of issuance to alleviate concerns about market manipulation and death spiral problem. Similarly, (McDonald, 2010) suggests conversion into a fixed number of shares at a premium price which makes the value of newly converted shares worth less than the par value of

the bond in order to reduce the risks of manipulation and death spirals.[17] However, (De Martino et al., 2010) suggest setting a floor on the share price used for conversion or in other words setting a cap on the maximum number of shares upon conversion in order to mitigate significant dilution of ownership that leads to death spirals.

IV. An Empirical Evidence on Designing Triggers for Contingent Capital

Contingent capital instruments are the new instruments proposed to provide additional loss absorbency for the banks. Different features of the contingent capital instruments could make an analysis of the advantages and disadvantages of contingent capital instruments more complicated and have different implications for bank regulatory and supervisory objectives as well as market outcomes. Thus, designing an optimal characteristic of contingent capital for prudential purpose is a difficult challenge since it is still an untested instrument. Given other features of conversion mechanism, the proposed triggers for conversion also vary. They could be based on a systemic versus bank-specific trigger or a market-based trigger versus regulatory capital ratios or supervisory discretion triggers. Designing the appropriate trigger(s) for conversion of contingent capital instruments becomes an interesting empirical issue. This section provides empirical evidence for the design of appropriate trigger(s) for conversion of contingent capital instruments. Using Thailand's experience with bank recapitalization during the financial crisis in 1997 and the data covering two different financial crises, namely the Thai financial crisis of 1997-1999 and the global financial crisis of 2007-2009, this paper examines what indicators would work better as trigger(s) for conversion of contingent capital.

A. Thailand's Experience with Bank Recapitalization Using Hybrid Capital Instruments during The Financial Crisis in 1997[18]

During the Thai financial crisis in 1997, the capital inadequacy of various finance companies had spread to small banks and became a systemic financial crisis after a period of economic contraction and declining asset values.[19] Amid the crisis,

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[17] According to (McDonald, 2010), a fixed share conversion at premium gives rise to multiple equilibria arising from using a stock price trigger and a non-par conversion which (Sundaresan and Wang 2010) argue that will lead to a transfer of value between shareholders and contingent capital holders which affects the share price.

[18] Refer mainly from (Santiprabhob, 2003).

[19] According to (Santiprabhob, 2003), the assets of finance companies were mainly concentrated in real estate sector and stock-market margin lending which had experienced declining asset values since the end of 1996. However, market rumors about the capital inadequacy in various finance companies began to circulate during the beginning of 1997 and resulted in deposit runs since then.

immediate and massive recapitalizations were needed to preserve the solvency of financial institutions. Apart from the need to maintain the 8.5% minimum capital adequacy requirements, banks were also in need of new capital to cushion against rising NPLs, to meet tightening loan loss provisioning requirement, to enable them to realize losses from debt restructuring, and also to facilitate them to make additional new lending.

During the first half of 1998, a limited number of large private banks succeeded in raising new capital by selling most of their newly issued straight equity to foreign investors to recapitalize on their own following the liberalization of foreign ownership in November 1997.[20] Specifically, according to (Santiprabhob 2003), Bangkok Bank, Kasikorn Bank (formerly called Thai Farmers Bank) and Bank of Ayudhaya raised 43 billion baht, 33 billion baht and 12 billion baht in new capital between March and May 1998, respectively. However, as economic conditions deteriorated markedly and market conditions were not supportive of recapitalization, the government introduced a public capital support scheme which started on August 14, 1998 until the end of 2000. Due to private banks' concerns on potential government interference, a limited number of financial institutions had been recapitalized with a total capital of 73.7 billion baht injected into financial institutions under such scheme [see (Bank of Thailand 2000) and (Santiprabhob 2003)].

As banks had very limited opportunity of recapitalization by issuing a large amount of straight equity amid the financial crisis and a collapse in stock market[21], some family-owned private banks attempted to recapitalize on their own to avoid government recapitalization and loss of control by using new hybrid capital instruments. The new hybrid capital instruments, called "Stapled Limited Interest Preferred Stock" (SLIPS) and "Capital Augmented Preferred Securities" (CAPS), combined non-cumulative preferred shares with subordinated debts. To facilitate massive recapitalization needs of private banks, the Bank of Thailand allowed the use of hybrid capital instruments for bank recapitalization and relaxed the BIS ceiling for hybrid capital to be counted as Tier 1 capital for up to one-third or 33% of total Tier 1 capital in March 1999. However, such ceiling for hybrid Tier 1 capital was lowered to 25% of total Tier 1 capital in June

[20] In November 1997, in order to help recapitalize private financial institutions, the government relaxed the existing restriction on foreign ownership of commercial banks by allowing foreign investors to hold a majority shareholdings of up to 100% (from 25%) in financial institutions for a period of up to 10 years, after which their foreign shareholdings would be grandfathered with respect to the absolute amount of their equity holding until their foreign equity stake falls below 49%. However, the new Financial Institutions Business Act of 2007 stipulates that foreign ownership may continue to exceed 49% with certain exemptions granted from the Ministry of Finance.

[21] The Stock Exchange of Thailand's banking sector index significantly declined by more than 70% during the second quarter of 1998.

1999 and reduced to the limit of 15% of total Tier 1 capital in line with the BIS capital securities guideline later in February 2006.[22]

During the first half of 1999, there were five private banks that recapitalized by issuing the hybrid capital instruments worth in total of 82.4 billion baht (see Table 1). According to (Santiprabhob, 2003), "the share of hybrid instruments to each bank's Tier 1 capital at the time of issue ranged from 32 to 50%". The hybrid instruments provided investors with highly attractive returns commensurate with their risks while incurring high costs for the issuing banks. With limited opportunity for banks to recapitalize using straight equity, the hybrid instruments, however, provided Thai private banks with a temporary and flexible capital structure and could be viewed as low-cost capital that significantly helped Thai private banks to recapitalize amid the financial crisis in 1997 while minimizing the dilution effects on existing shareholders.

Table 1: Recapitalization Efforts of Private Banks Using Hybrid Capital

Bank	SLIPS / CAPS (Million Baht)	Issue Date
BAY	12,996	17 Mar 1999
BBL	34,497	2 Apr 1999
DTDB	5,000	3 Jun 1999
KBANK	19,967	11 Jan 1999
TMB	9,957	7 Jun 1999
Total	**82,417**	

Source: Kim Eng Research Center

B. Designing Conversion Trigger of Contingent Capital Using Evidence from Thailand

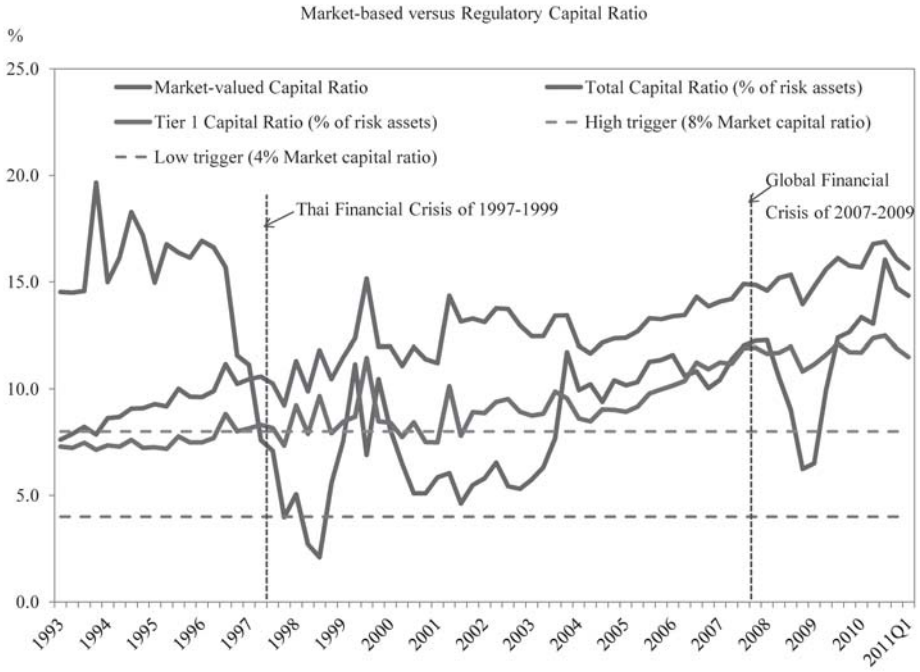
Appropriate trigger(s) for conversion of contingent capital instruments is needed to make the instruments more feasible for facilitating expedited recapitalization for distressed banks, restoring market discipline, as well as preventing a systemic crisis. Thus, this subsection examines whether a regulatory trigger or a market-based trigger would have worked in the past. Using the data from Thailand that cover two different financial crises—the Thai financial crisis of 1997-1999 and the global financial crisis of 2007-2009, supporting empirical evidence are provided with a view to drawing some policy implications for the design of contingent capital instruments.

[22] The Bank of Thailand also issued revised capital rules tightening hybrid capital definition in February 2006 and issued requirement for loss-absorbency on a going-concern basis of hybrid Tier 1 capital in 2007.

In doing so, banking data used in this study cover the period from 1993 to the first quarter of 2011. Quarterly aggregate data for Thai banks are obtained from the Bank of Thailand (BOT)'s website while the financial data for each bank are obtained from the Stock Exchange of Thailand (SET).[23] Daily and quarterly market data are from Bloomberg. Quarterly data on Gross Domestic Product (GDP) are from the Office of the National Economic and Social Development Board (NESDB)'s website.

Similar to (Flannery, 2005, 2009), (Pennacchi, 2010) and (Calomiris and Herring, 2011), a market-value capital ratio is used as a market-based trigger and advocated as appropriate trigger for conversion of contingent capital. Following (Calomiris and Herring, 2011), a market-value capital ratio is defined as the ratio of market value of bank equity over the sum of the market value of bank equity plus the book value of bank liabilities.

Figure 1: A Comparison between Market-based and Regulatory Capital Ratio



[23] For the analysis of market-based trigger, daily data for bank-specific accounting variables are interpolated assuming bank liabilities to stay at quarter-end figures for all days of a given quarter.

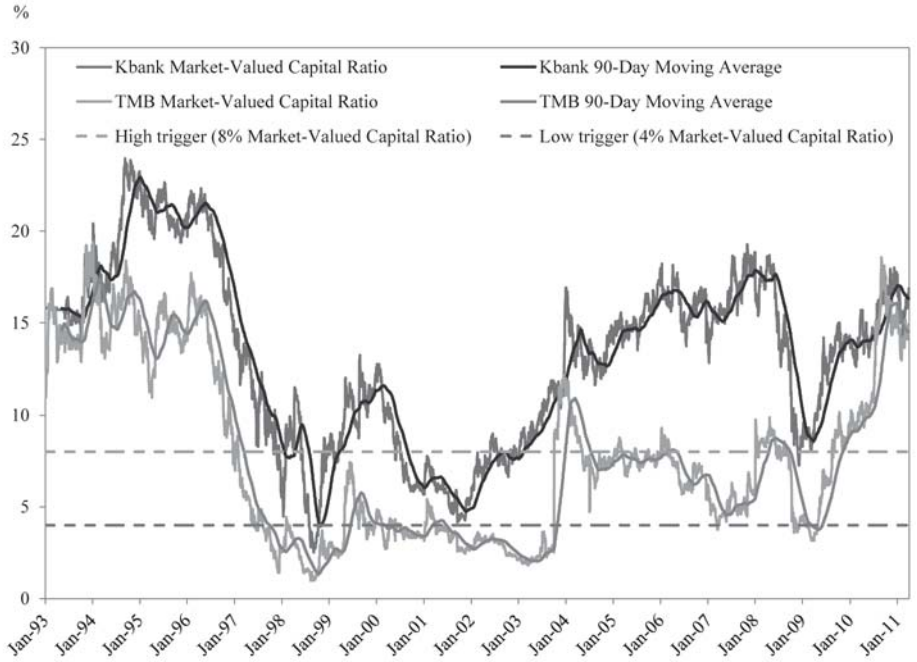
As shown in Figure 1, triggers based on total regulatory capital ratio and Tier 1 capital ratio were unable to identify problem arising with Thai banks both during the Thai financial crisis in 1997 and the global financial crisis of 2007-2009; whereas, a market measure of capital ratio was better to indicate Thai banks' aggregate solvency problem. This empirical evidence is consistent with (Flannery, 2009) and (Calomiris and Herring, 2011) which indicate that many banks or financial institutions that were bailed out during the global crisis in 2008 all reported excess or adequate capital prior to their failure. Moreover, the results are also in line with (Shimizu, 2011) which suggests that market-value capital ratio is a better measure of bank soundness than the regulatory capital ratio.

A market-value capital ratio could provide an early warning of bank's risk or solvency. This is well evidenced by a significant decline in market-value capital ratio of Thai banks as a whole since 1996 prior to the financial crisis which became apparent in 1997 (see Figure 1). However, as market-based trigger can be subjected to excess market volatility and manipulation, this paper uses a 90-day moving average of the market-value capital ratio as suggested by (Calomiris and Herring, 2011) based on the experience from the recent global crisis in order to reduce noise in market value signals.[24] A long moving average period would provide greater reliability of the signal but would be less timeliness than a shorter time period. Figure 2 shows an example of the smoothing effect of the 90-day moving average of the market-value capital ratio of two Thai banks over two different crises during 1993 to March 2011.

A further look at individual bank data would give a complete picture of whether a market-value capital ratio could identify banks that are in distress and be used as trigger for conversion of contingent capital since aggregate data could be driven by the performance of large banks. Figure 3 illustrates a comparison of the 90-day moving average on the market-value capital ratio of an example of sound and distressed banks during two different crises covering the Thai financial crisis of 1997-1999 and the global financial crisis of 2007-2009.

[24] As the purpose of contingent capital instruments is to motivate share offerings in the wake of equity value losses, (Calomiris and Herring, 2011) suggest a 90-day moving average rather than a shorter time interval to offer "plenty of time for policy makers to respond to low-frequency disruptions, and also for banks to respond to declines in equity value by raising new equity in the market."

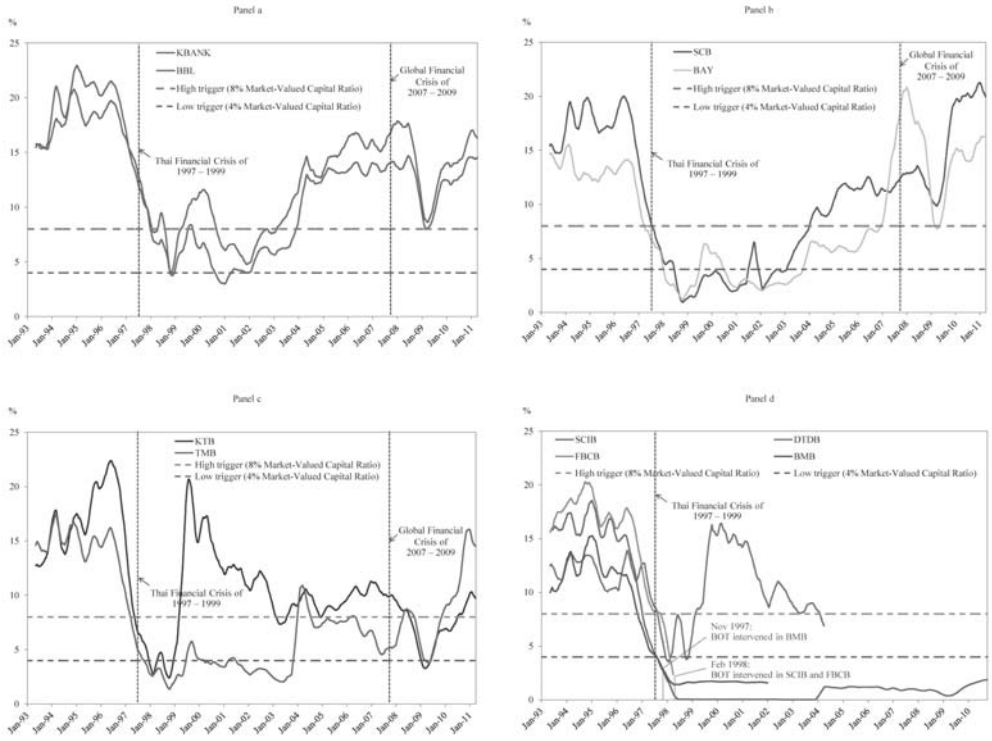
Figure 2: The Impact of a 90-day Moving Average on Smoothing Market Volatility



The comparison of individual bank's solvency as depicted in Figure 3 provides ample evidence that the market-value capital ratio could well distinguish between soundly-managed banks and weaker or distressed banks. Specifically, the market-value capital ratios of banks that were in severe distress and ultimately intervened or closed down declined markedly below the threshold value well before the financial crisis became apparent and widespread in 1997 (see panel d of Figure 3). If an expedited recapitalization mechanism of contingent capital instruments had been adopted earlier, it might have helped to reduce the number of financial institutions that were intervened or closed down and mitigate the magnitude of the Thai financial crisis of 1997-1999.

Although the Thai banking system was resilient and, like other Asian countries, much less affected by the global financial crisis of 2007-2009, the market-value capital ratio could still well identify financial distress of poorly performing banks. For example, the market-value capital ratios of some banks that tend to manage relatively poorly fell below the threshold values of both high and low triggers (see panel c of Figure 3).

Figure 3: A Comparison of The 90-day Moving Average on The Market-Value Capital Ratio of An Example of Sound and Distressed Banks

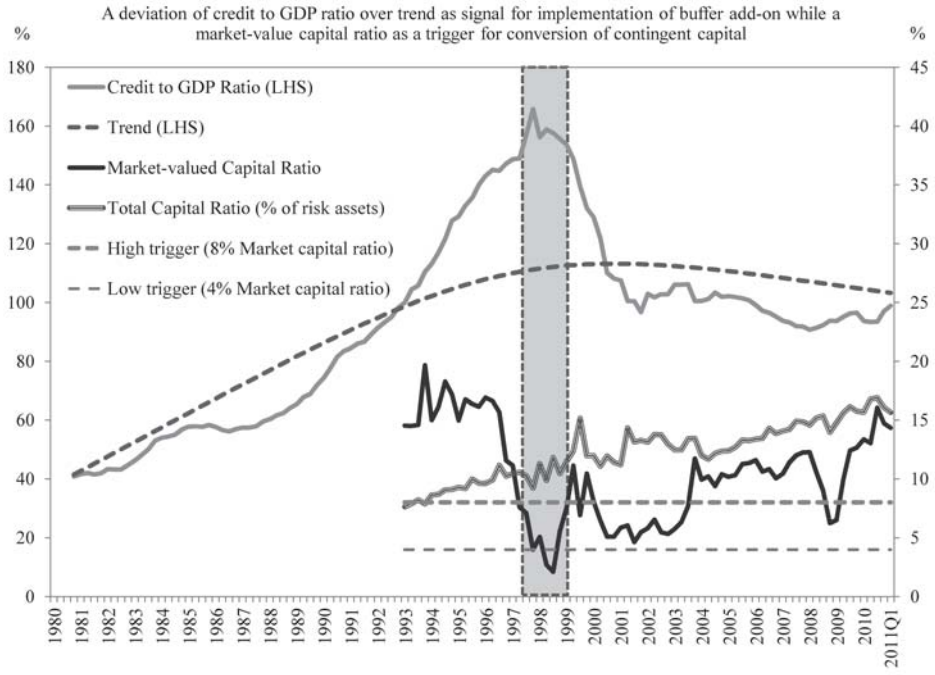


Due to the ability to identify distressed banks as evidenced from the experience of Thai banks over the two crisis periods between the Thai financial crisis of 1997-1999 and the global financial crisis of 2007-2009, the market-value capital ratio could, therefore, be advocated as an appropriate trigger for conversion of contingent capital.

Moreover, Figure 4 well illustrates from Thailand's experience particularly during the financial crisis in 1997 a potential role of contingent capital to meet a countercyclical capital buffer requirement that if put in place when there was a build-up of system-wide risk would have helped protect the banking sector from a downturn. Specifically, if Thai banks issued contingent capital to build up their additional capital buffer in periods of excessive credit growth when the risks of system-wide stress were growing markedly, they would have had adequate capital in bad times when contingent capital converted into equity to protect them against potential losses and support their lending activities. As a consequence, the credit crunch in the economy could have been avoided and the magnitude of the Thai financial crisis of 1997-1999 would have been mitigated.

Following a common starting reference guide on the implementation of the countercyclical capital buffer add-on by the Basel Committee, the deviations of the credit to GDP ratio from a long term trend is used as a signal of excessive credit growth associated with a build-up of system-wide risk.[25,26] According to (Basel Committee on Banking Supervision, 2010a), the historical evidence shows that the credit to GDP gap was the best performing indicator among a broad set of information to gauge the build-up of system-wide risk.[27] In addition, as the credit to GDP ratio is based on credit, it suits quite well to the purpose of the countercyclical buffer to achieve the broader macroprudential goal of protecting the banking sector from periods of excessive credit growth.

Figure 4: A Potential Benefit of Contingent Capital during The Thai Financial Crisis in 1997



[25] A broad definition of private credit that includes all credit extended to households and other non-financial corporations by all depository corporations other than the Bank of Thailand is used to assess a period of excess credit.

[26] A long-term trend of the credit to GDP ratio is calculated using Hodrick-Prescott (HP) filter with smoothing parameter set to 400,000. According to the (Basel Committee on Banking Supervision 2010a), the HP filter tends to give higher weights to more recent observations and is likely to be able to deal more effectively with structural breaks.

[27] The range of variables include aggregate macroeconomic variables such as GDP growth and real credit growth, deviations of the credit to GDP ratio, real equity prices as well as real property prices from their respective long term trend, measures of banking sector performance such as aggregate profits or bank losses, and proxies for the cost of funding in the form of credit spreads.

The shaded area in Figure 4 illustrates the potential benefit of contingent capital that would have helped to provide an expedite recapitalization mechanism for the Thai banking sector during the financial crisis in 1997, if the credit to GDP ratio which rose well above its trend was used as a signal for the issuance of contingent capital to meet the implementation of countercyclical capital buffer add-on while the market-value capital ratio was used as trigger for conversion into equity when it fell below a pre-specified threshold value (i.e. high trigger of 8% of market-value capital ratio).

V. Conclusions and Policy Implications

With automatic conversion from debt into equity when a pre-determined trigger falls below a threshold value, contingent capital is a new instrument that provides an expedited private recapitalization for banks in time of financial distress. Being advocated as a potentially lower-cost form of loss-absorbing capital in periods when bank recapitalization by issuing significant equity would imply substantial dilution of stockholders and system-wide risks are growing markedly, contingent capital instrument could help address some of the challenges or issues arising from previous financial crises. In particular, contingent capital would address the challenges that (1) government bailouts of insolvent banks would provoke moral hazard from too-big-to-fail financial institutions, create distorted incentive for bank risk which thereby weakening market discipline, and result in the use of taxpayer funds; (2) banks had inadequate equity capital to absorb losses from risky investments and protect them from insolvency; and (3) traditional hybrid securities and subordinated debts did not provide meaningful loss absorption during the past crises.

A well designed contingent capital would help improve incentives for banks' risk management and enhance market monitoring which thereby restoring market discipline in banking. This is attributable to a conversion mechanism of contingent capital instrument that makes the shareholders subject to the risk of getting diluted while the holders of contingent capital subject to the risk of being converted into equity. Moreover, with its countercyclical properties, contingent capital also has a potential role as a countercyclical capital buffer add-on that the banking sector would have to build up in good times when system-wide risks are growing and use to absorb potential losses or prevent a credit crunch in the economy during bad times.

Using the data from Thailand that cover two different financial crises, namely the Thai financial crisis of 1997-1999 and the global financial crisis of 2007-2009, this paper provides ample empirical evidence supporting the use of a market-value capital ratio as trigger for conversion of contingent capital. While regulatory capital-based triggers were unable to identify problem arising with the Thai banking sector, the market-value capital ratio could well identify Thai banks' aggregate

solvency problem and distinguish between soundly-managed banks and weaker or distressed banks over two different financial crises, especially during the Thai financial crisis in 1997.

Moreover, Thailand's experience particularly during the financial crisis in 1997 also empirically supports a potential benefit of contingent capital as countercyclical capital buffer add-on. If Thai banks issued contingent capital to build up their additional capital buffer in periods when system-wide risks were growing markedly as signaled by a deviation of credit to GDP ratio over trend, they would have been immediately recapitalized and had adequate capital when the market-capital ratio breached a pre-specified threshold trigger for conversion into equity to protect them against potential losses and support their lending activities during the Thai financial crisis in 1997. Ultimately, contingent capital instruments, if had been adopted earlier, might have helped reduce the number of distressed banks, avoid a credit crunch in the economy, and mitigate the magnitude of the financial crisis in 1997.

Although the capital structures of Thai banks are comprised mainly of common equity and modest amounts of hybrid capital securities, Thailand's experience over two different crises could provide support for the potential benefits of contingent capital instruments for achieving both micro-prudential and macro-prudential stability and be useful for the design of contingent capital. However, with some skepticism about the relative cost and the potential effects on market dynamics of contingent capital instruments which are still untested in a crisis, the Basel Committee requires banks to primarily use common shares and retained earnings to meet additional loss absorbency capital requirements. This paper agrees with the use of better quality capital to satisfy new capital requirements, and also supports the use of going-concern contingent capital instruments to build up capital on top of the Basel capital requirements to provide banks with an expedited but potentially lower-cost recapitalization mechanism while the market conditions are not supportive of bank recapitalization.

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