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COUNTERCYCLICAL CONTINGENT CAPITAL (CCC): POSSIBLE USE AND IDEAL DESIGN

by Giuseppe De Martino*, Massimo Libertucci*, Mario Marangoni* and Mario Quagliariello*

Abstract

Contingent capital – any debt instrument that converts into equity when a predefined event occurs – has received increasing attention as a viable tool for allowing banks to raise capital when needed at relatively more affordable prices than common equity. While the debate has focused on contingent capital for systemically important financial institutions, this paper concentrates on its possible use for covering capital needs arising from the implementation of countercyclical buffers. We propose the introduction of countercyclical contingent capital (CCC) based on a double trigger. The interaction of the two triggers would determine a quasi-default status. Conversion would be required when the financial system is simultaneously facing aggregate problems and the individual bank – while still in a going concern status – shows weaknesses. Building on this proposal, the paper tests how different double triggers would have worked in the past and discusses the optimal design of the conversion mechanism and prudential treatment.

JEL classification: G01, G18, G28.

Keywords: Basel 2, capital buffer, procyclicality, contingent capital, financial crisis, reforms.

Contents

* Bank of Italy, Banking and Financial Supervision Area.

1. The rationale for contingent capital[1]

Academics and regulators have recently considered contingent capital – any debt instrument that converts into equity when a predefined event occurs – as a viable tool for allowing banks to raise capital at relatively more affordable prices than common equity. Recently, the Basel Committee for Banking Supervision (2009) and the European Commission (2010) have explicitly referred to the importance of reviewing the role that contingent capital could play in the new regulatory capital framework.

This is not a new topic. A wide variety of forms of funding that – more or less automatically – either bear losses or convert to common equity at a predefined level of a given trigger have been proposed over the years. Since 2000, for instance, the reliance on subordinated notes and debentures has been advocated as a possible tool for improving market discipline of larger intermediaries and identifying market-based triggers for an effective and prompt corrective action (Flannery, 2005). The subscribers of subordinated debt would have strong incentives to monitor the operations of the issuer since their investment would be lost in the event of failure.

There are several goals behind more recent proposals, including that of improving the levels and quality of bank capital, the provision of extra financial resources for systemically important financial institutions (SIFIs), and the development of credible countercyclical buffers.[2] The common driver is the belief that contingent capital can strengthen market discipline with respect to capital requirements, preventing excessive capital levels from reducing the use of debt as a disciplining device for banks' managers. Having said this, it is fair to acknowledge that a second driver is to develop a capital tool that, while able to cover losses when needed, is less expensive for banks. Since post-crisis regulation is likely to insist on raising capital quality, there is clearly an appetite for instruments that – while satisfying supervisors' requests – are also able to keep funding costs under control. Moreover, compared with subordinated debt, contingent capital would introduce a more balanced distribution of risks between bondholders and equity holders, as bonds run the risk of being converted into equity and shares of getting diluted.[3]

While the debate has focused on contingent capital for SIFIs, we concentrate instead on its possible use for covering capital needs arising from the implementation of countercyclical buffers. Indeed, the role of contingent capital in a countercyclical toolkit is, in our view, the most interesting open issue. This would mean that in good times banks

[1] We are grateful to the following people for their useful comments: F. Cannata, F. Columba, A. Conciarelli, N. di Iasio, A. Enria, A. Generale, G. Mazzoni, F. Piersante, A. Pilati, C. Salleo and the participants at the Ceis - Tor Vergata Economics Foundation XXII Villa Mondragone International Economic Seminar. A final thank goes to Alice Chambers for the final revision of the paper. The opinions expressed are those of the authors alone and do not necessarily reflect those of the Bank of Italy.

[2] BCBS (2009).

[3] There is also scepticism about the introduction of capital instruments that can turn out to be overly complex (Goodhart, 2010).

would be allowed to issue contingent capital in order to build up the buffer; in bad times, contingent capital would be converted into common equity, thus providing banks with sufficient resources for avoiding a credit crunch. In our setting, while minimum capital requirements and regulatory capital remain the policy instruments for achieving microprudential stability, countercyclical buffers and (countercyclical) contingent capital are the instruments for pursuing the new macroprudential objectives put forward by the G20 leaders.

The core of our proposal is the ex ante probability of conversion of countercyclical contingent capital (CCC): in order to be feasible, it should be lower than Tier1 hybrids, and ideally greater than Tier2 subordinated debt. This guarantees that the cost of CCC is in-between Tier1 and Tier2 instruments. The purpose of the paper is to understand whether there is room for this kind of capital instrument and what the optimal design should be. We propose a double trigger in the conversion process from debt to equity. Conversion would be required when simultaneously: a) the financial system is facing problems, as predefined by some quantitative rule; and b) the individual bank – while still in a going concern status – shows weaknesses (for instance, in the form of a capital adequacy ratio below a predefined threshold, set above the minimum). The interaction of the two triggers would give rise to a 'quasi-default' status: the bank is still able to meet regulatory requirements with its current capital, but additional capital injections are needed as aggregate risk is increasing. We thus analyse how the two triggers should be calibrated and discuss the most suitable conversion rules and prudential treatment.

Our proposal makes a clear distinction between microprudential and macroprudential policy objectives and, accordingly, a precise partition between regulatory capital and countercyclical contingent capital. Therefore, during a systemic crisis, it may happen that CCC is converted, while Tier1 subscribers are not affected at some banks; by the same token, in the event of idiosyncratic problems, CCC investors would be unaffected whereas Tier1 subscribers may bear losses. We believe that this is not a shortcoming, since the two tools face different risks: systemic (or macroprudential) risk the former, idiosyncratic (or microprudential) risk the latter.

This approach has two advantages. First, it makes macroprudential policies more credible, since a specific macroprudential instrument would serve exclusively macroprudential targets. Second, the different scope of regulatory capital and CCC would reduce the risk of overly complex capital instruments, which may lead to regulatory circumvention and arbitrage.

The paper is organized as follows. Section 2 reviews the most recent proposals on contingent capital. Sections 3 and 4 describe the existing and forthcoming rules on supervisory capital as well as some examples of the concrete use of contingent capital. Section 5 assesses the various proposals and sets the stage for sections 6 and 7, which focus on the possible use of convertible debt as a complement to countercyclical capital buffers.

Section 8 discusses how the conversion mechanism should be designed and Section 9, the most suitable prudential treatment. Section 10 concludes.

2. A review of the proposals

Several variants of contingent capital have been proposed over the years. The current debate focuses on forms of capital that – more or less automatically – convert to common equity at a given level of a predefined variable.[4]

There are a number of – not necessarily mutually exclusive – goals behind these proposals: the improvement of the levels and quality of bank capital, the provision of extra financial resources for SIFIs, and the development of credible countercyclical buffers. The common driver is the belief that contingent capital can add significant market discipline with respect to capital requirements, also preventing excessive levels of capital from reducing the use of debt as a disciplining device for banks' managers.

The idea of requiring banks to issue special capital instruments is not a new one. Since 2000, particularly in the US, the issue of subordinated notes and debentures has been advocated as a valuable tool for improving market discipline of larger intermediaries and identifying market-based triggers for prompt supervisory corrective action. Some proposals envisage that subordinated debt, with sufficient long-term maturity, should represent a minimum share of a bank's risk-weighted assets. The subscribers of subordinated debt would have an incentive to monitor the operations of the issuer since their investment would be wiped out in case of failure. In fact, subordinated debt holders, while unaffected in going concern scenarios, would bear losses in the case of default ('gone concern').

However, the disciplining impact of subordinated debt is greatly reduced if there is an – even small – likelihood of public intervention during a crisis. Indeed, expectations of public bailout would limit the downside risk for subordinated bondholders. Since SIFIs are more likely to be bailed out with taxpayers money, this kind of mechanism would not meet its goals. Rational agents would require lower risk premia for subordinated bonds issued by SIFIs, thus creating an uneven playing field.

The introduction of contingent capital could therefore be viewed as an evolution of subordinated debt, without its shortcomings. In its basic design, contingent capital is a hybrid security that contains triggers which convert it into common equity. The advantages of contingent capital are clear: while it would maintain the benefits of debt instruments, subscribers would be exposed to the consequences of excessive risk taking and would thus be more willing to monitor the firm; on the other hand, shareholders would also have a strong incentive to monitor risk exposures in order to avoid massive dilution when debt is converted to capital. In practice, the burden sharing largely depends on the conversion mechanism.

[4] See Turner (2010) for an exhaustive survey.

As we mentioned earlier the main difference between the various proposals probably centres around the identification of the trigger variables (bank specific vs. aggregate or both) and the levels at which they are activated. The choice is (implicitly) driven by the goal of the tool.

Flannery (2005), for instance, proposes the use of reverse convertible debentures triggered by a bank-specific variable. These bonds would be automatically converted into equity if the bank's market capital ratio (equity's market value over assets) fell below a predetermined level: neither the issuer nor the subscriber would have any option regarding the conversion. The risk of price manipulation by interested parties would be reduced by averaging market prices over a given time interval; this would also reduce potential noise in daily data. The focus is clearly on an idiosyncratic crisis.

Conversely, Hancock and Passmore (2009) suggest mandatory convertible subordinated debt that banks would be required to issue in good times. This instrument would be subordinated to all other debt claims and would automatically convert into common equity during a systemic crisis. Therefore, they specify a single trigger that is totally independent from firm-specific risks and calibrated in order to be pulled very infrequently (once-in-a-lifetime).

A third option is to use a double trigger. The Squam Lake Working Group propose that banks issue mandatory long-term debt instruments in good times; during a crisis, they would be automatically converted into equity. Conversion would be determined subject to two conditions: a) the financial system incurred a systemic crisis, as announced by the supervisory authority; and b) a bank-specific variable – such as the capital adequacy ratio – is triggered. In their view, a double trigger is important for two reasons. First, if conversion is limited to the occurrence of systemic crises, the contingent capital will provide the same benefit – in terms of a disciplining factor for managers – as debt in all but the most extreme periods. Second, if conversion is only based on systemic triggers, even sound banks would be forced to convert in a crisis. Mc Donald (2010) also opts for a set of triggers which, however, rely on market-based indicators. Contingent capital would be converted if both the firm's stock price and a financial sector index drop below predefined values. In his view, market variables are preferable to accounting ratios because the latter are updated less frequently and are backward-looking; moreover, accounting rules may be subject to arbitrage.

In terms of conversion, most of the proposals suggest that the share price at the time of conversion should be the strike price. According to Flannery (2005), this guarantees that subscribers lose no principal values upon conversion, while existing shareholders are diluted and must share the firms' future cash flows with the new shareholders. However, conversions based on market prices can open the way to manipulation (Squam Lake, 2009). Contingent capital subscribers, for instance, might try to push the share price down so they would receive a larger share of the equity in the conversion. Moreover, there are also risks of death spirals: the risk of dilution of the existing shareholders may further depress the

share price, leading to more dilution, and so on and so forth. On the other hand, the use of average figures for market prices (e.g., the average share price over the past *n* days) may provide some incentives to existing shareholders to anticipate the conversion. Indeed, if the share price falls sharply during a crisis, shareholders may find it preferable to force conversion at a price that still looks acceptable. For these reasons, the Squam Lake Group proposes to convert each currency unit of debt into a fixed quantity of shares, rather than a fixed value of equity. A similar view is shared by Mc Donald (2010) who argues that the risk of manipulation is lower in the case of fixed share premium conversion schemes.

3. Rules

The purpose of regulatory capital is to absorb banks' unexpected losses, i.e. those losses that the bank has not foreseen in the normal course of business. Traditionally, prudential regulation has identified two components of regulatory capital:

- Tier1 capital, which absorbs losses on a going concern basis, allowing an institution to continue its activities and helping to prevent insolvency; and
- Tier2 capital, which absorbs losses on a gone concern basis, helping to ensure that depositors and senior creditors can be repaid should a default occur.

Under the current standard, banks can hold as little as 2 per cent common equity (i.e., ordinary shares and retained earnings) to risk-weighted assets. As a consequence, some banks have recorded strong Tier1 ratios with limited loss absorption. Against this background, in 2009 the Basel Committee for Banking Supervision (BCBS) proposed a new – and stricter – definition of regulatory capital. Specific criteria have accordingly been identified to ensure that Tier1 and Tier2 instruments are actually able to absorb losses on a going and gone concern basis, respectively.

To this end, common equity is recognized as the highest-quality component of capital: as such, it must represent the predominant form of Tier1 capital.[5] Non-common equity elements can also be included – within limits – in Tier1 capital provided they absorb losses while the bank remains a going concern. In particular, qualifying instruments must provide the bank with permanent resources and be capable of absorbing losses in practice without exacerbating a bank's condition in a crisis. In that respect, contingent capital seems to find some room in Tier1 to the extent that it meets – along with other eligibility criteria – principal loss absorption through either (i) conversion to common shares at an objective pre-specified trigger point or (ii) a write-down mechanism, which allocates losses to the instrument at a pre-specified trigger point.

[5] Common equity is subordinated to all other elements of funding, absorbs losses and has full flexibility of dividend payments.

As for the gone concern capital, the structure of Tier2 capital is simplified: all Tier2 instruments should be subordinated to depositors and creditors and have an original maturity of at least 5 years. No specific mention of contingent capital is made.

In Europe the potential of contingent capital has been recognized in the amendments to the Directive 2009/111/EC on capital requirements (the "CRD2"). This considers as eligible in Tier1 hybrid capital instruments that convert to common equity in either emergency situations or at the discretion of supervisory authorities, based on the institution's financial and solvency position. This is an example of the use of contingent capital for going concern purposes.

Some details on how Tier1 hybrids work have been provided by the Committee of European Banking Supervisors (CEBS, 2009). According to CEBS guidelines, an emergency situation occurs at least when the bank is in breach of minimum capital requirements (i.e., 4 per cent Tier1 capital ratio and 8 per cent total capital ratio). Competent authorities may set higher limits, either on a general basis (i.e., for all institutions) or for single institutions. The definition of the emergency situation is clearly still close to a going concern scenario, particularly if limits are higher than the regulatory minima. Independently of the existence of an emergency situation, supervisors can trigger conversion at their discretion. Hence, contractual clauses cannot prevent the competent authority from exercising this option, while the issuer may have the option to convert at any time. Needless to say, the focus is on idiosyncratic events.

4. Practices

The use of contingent capital has been limited to date. This explains why the issuances of contingent debt by Lloyds banking Group (LBG) and Rabobank have become popular case studies (Table 1).

In November 2009 LBG announced a capital plan designed to increase core capital and exit the UK Government Asset Protection Scheme. One component of this transaction was a £7 billion Liability Management Exercise available to holders of certain outstanding Tier1 and Upper Tier2 instruments (existing securities) according to which – among other transactions – holders were offered a par-for-par exchange into LBG enhanced capital notes (ECN) carrying a coupon equal to the coupon of the existing securities (fixed rate or floating rate for life depending on the existing securities), plus a premium. The ECNs represent a new contingent capital instrument in the form of a lower Tier2 dated subordinated note with bullet maturities of at least 10 years, no issuer call and no coupon deferral. They are mandatorily convertible into a pre-determined number of LBG ordinary shares[6] upon breach of a minimum 5 per cent Core Tier1 ratio. For regulatory purposes the

[6] Any investor who does not have the capacity to hold ordinary shares will have the ability to receive the cash equivalent of the ordinary shares upon conversion.

instrument is treated as Tier2 for ongoing capital adequacy calculations; it has been granted Core Tier1 quality for stress test capital calculations, meaning that it can be counted as Core Tier1 when assessing the bank's capital adequacy in the stress test exercise required by the UK regulator.

In March 2010, Rabobank also announced its intention to issue a senior contingent note. The scheme differs substantially from the Lloyds' ECNs since, until conversion, the proposed notes are senior unsecured bank debt, ranking senior to all subordinated capital of Rabobank (i.e., it is unlikely to benefit from any regulatory capital recognition). Also the trigger and the consequences of the materialization of the triggering event are different. The trigger resembles the Core Tier1 ratio, even though the definition of equity is the accounting – not the prudential – one (i.e., membership certificates and retained earnings). Should the bank's equity/RWA ratio fall below 7 per cent, the instruments would not be converted, but they would be written down to 25 per cent of face value. The capital gain generated by the redemption at a discount of the instruments will serve to increase the bank's capital base through an increase in reserves.

Table 1 - Main characteristics of some outstanding contingent capital issuances

Issuer	*Lloyds*	*Rabobank*
Denomination	Enhanced Capital Note (ECN)	Senior Contingent Notes (SCN)
Maturity	Minimum 10 years	10 years
Coupon	Premium of 1.5% – 2.5 % above the rate of the respective security being exchanged (approx. 10.15%)	6.875%
Coupon deferral/cancellation	None	None
Conversion trigger	Core Tier1<5%	Equity/RWA <7%
Conversion price/write-down rate	LBG share price at issuance	75% permanent write-down; 25% plus accrued interest is paid back to the holder
Post-conversion status	Ordinary shares	Reserves
Ranking before conversion	Pari passu with Lower Tier2	Senior to all subordinated debt of the bank
Pre-conversion regulatory treatment	Lower Tier2 (core Tier1 for the purposes of FSA stress test)	No recognition for regulatory purposes

In terms of conversion mechanisms, for LBG the conversion price has been set at issuance (more precisely, it is the share value at the end of the exchange offer period). This implies that dilution is limited to a pre-defined fixed number of shares and investors have full equity downside risk since the beginning. The ECN is therefore expected to have a yield close to Tier1. In the case of Rabobank, as there is no issuance of shares or other capital instruments, there is no dilution for existing shareholders; the investors of senior contingent notes have no potential to receive any upside after the trigger is activated. This suggests that the instrument should receive a substantial premium over senior unsecured instruments.

5. An assessment of the proposals

In the previous sections, we described how many debt instruments can be found under the common label 'contingent capital'.

From a going concern perspective, triggers are typically bank specific and generally linked to some measures of solvency (for instance the Tier1 ratio). As we mentioned above, there are clearly limits in these kinds of triggers. A rule-based trigger may be manipulated and existing shareholders may decide to opt out in order to avoid dilution once a bank begins to get into trouble. Conversely, a trigger based on supervisory discretion may encourage forbearance and provide market participants with inaccurate signals, possibly giving rise to alarm and increasing the likelihood of self-fulfilling crisis episodes.

There is also a lively debate on the possible role of contingent capital in a gone concern scenario. Compared with other bondholders, subscribers of subordinated debt require higher risk premia, since they bear losses in the case of default. As such, Tier2 subordinated debt is an efficient component of a bank's capital structure and, apparently, there is no need for contingent capital. However, this is only true for not too-big-to fail institutions. In the case of SIFIs, liquidation does not take place since this is typically anticipated (and thus avoided) by public bailouts. Therefore, subordinated debt holders do not bear (and do not expect to bear) any loss and they do not require higher risk premia. In other words, the distinction between going and gone concern is not meaningful since it fails to acknowledge that SIFIs never go through a 'formal' default status.

There are three undesired corollaries: i) SIFIs can raise capital at a lower cost than other institutions; ii) taxpayers have to bear those losses that are not covered by subordinated debt; iii) market discipline is reduced since subordinated debt-holders have no incentive to monitor shareholders and common shareholders monitor managers less effectively since they also benefit from the peculiar position of subordinated debt-holders. This increases moral hazard.

For these reasons we believe that gone concern scenarios should also include public bailouts and some form of contingent capital might be a useful tool for SIFIs. To be drastic, SIFIs should not be allowed to include subordinated debt in Tier2 capital, since it would never be activated for covering gone concern losses. Rather, we believe that contingent capital should be seen as a (more credible) variant of subordinated debt, which guarantees that subscribers do bear losses as in the case of not too-big-to-fail institutions.

6. Contingent capital and countercyclical buffers

Notwithstanding undeniable implementation issues, the use of contingent capital for dealing with idiosyncratic problems is conceptually clear. Indeed, the BCBS (2010b) has recently proposed to enhance the entry criteria of regulatory capital to ensure that all

eligible instruments issued by banks are capable of absorbing losses when a bank becomes non-viable.

We are much more interested in understanding whether there is also a possible role as a countercyclical tool. Indeed, since the new regulation is likely to insist on raising capital quality, there is interest in instruments that – while satisfying supervisors' requests – are also able to keep funding costs under control. In particular, there is great appetite for forms of contingent capital to be used for meeting countercyclical buffers. In this framework, in good times banks would be allowed to issue contingent capital in order to build up their capital buffer; in bad times, contingent capital would be converted into common equity, thus providing banks with sufficient resources for avoiding a credit crunch in the real sector.

At first glance, it is arguable that countercyclical buffers do serve to ensure that banks remain well capitalized in times of economic downturn and accordingly do not reduce the amount of credit. As it has to bear the increase in losses due to the downturn, the buffer should be covered with common equity. This does not leave a lot of room for contingent capital.

However, in our view this does not necessarily imply that contingent capital cannot be used for countercyclical purposes. Rather, we believe that introducing countercyclical contingent capital (CCC) would establish a clear distinction between microprudential and macroprudential policy objectives and, accordingly, a precise partition between regulatory capital and CCC.[7] To that end, however, we need to identify a trigger (or a set of triggers) which guarantees that the ex ante probability of conversion of countercyclical contingent capital (CCC) is lower than for Tier1 hybrids and, ideally, greater than for Tier2 subordinated debt (assuming that an idiosyncratic gone concern status represents a floor on the probability of bearing losses). If this trigger can be found, the ex ante risk premia and pricing of the different instruments can be determined according to the probability of conversion.

Against this background, one potentially workable design could be based on a double trigger, as suggested by the Squam Lake Working Group. Conversion would be required when simultaneously: a) the financial system is facing aggregate problems as predefined by some quantitative rule; and b) the single bank – while still in a going concern status – shows weaknesses (for instance, in the form of a capital adequacy ratio below a predefined threshold, set above the minimum). The interaction of the two triggers would determine a quasi-default status: the bank is still able to meet regulatory requirements, but a need for additional capital injection emerges since generalized problems are incoming (Table 2). In other words, our scenario is based on systemic distress, which is more likely to affect

[7] See Libertucci and Quagliariello (2010).

relatively less capitalized banks. These banks would thus be required to convert (countercyclical) contingent capital.[8]

Table 2 – Possible use of contingent capital

	Going Concern	*Gone Concern*	*"Quasi gone concern" (Countercyclical buffer)*
Predefined Trigger	Bank specific: Solvency ratio below a threshold T or authority decision	Bank specific: Liquidation or public bailout	Double trigger: problematic banks (solvency ratio < C ≥ T or authority decision) + systemic trigger
Trigger (ex post)	"	Liquidation (non SIFIs) / bailout (SIFIs)	"
Capital Component	Tier1 hybrids	Tier2 contingent capital	Countercyclical contingent capital (CCC)

This setting ensures ex ante consistency across capital tools, but it does not prevent seniority from being violated ex post. In other words, it may still happen that the double trigger is pulled in some states of the world, so that countercyclical contingent capital is converted, while Tier1 subscribers are not affected. By the same token, in the case of idiosyncratic problems, Tier1 subscribers may bear losses while CCC investors would be unaffected. We believe that this is not a major issue, since the two capital tools are supposed to face different risks: systemic (or macroprudential) risk the former, idiosyncratic (or microprudential) risk the latter. Much more debatable is whether, in practice, this combination of triggers can occur. The risk is clearly that of identifying a quasi-default status that is so improbable as to make the use of contingent capital futile. The next section is therefore devoted to some simulations based on different possible triggers.

7. Designing the trigger for countercyclical contingent capital

Data

Our simulations focus on eight countries (Canada, France, Germany, Italy, Spain, Japan, the UK, the US) over the period 1994-2009. This ensures that the functioning of CCC is tested for jurisdictions with different regulatory frameworks and financial markets. We select the top 15 banks in terms of total assets for each country at the end of each year.[9] This means that our sample is not constant over time, but mimics the structure of the banking systems at any point in time. On average, the turnover is material, since each bank is present in the dataset for about 7 years (Table 3).

Table 3 – Banks' turnover

Country	CA	DE	ES	FR	GB	IT	JP	US	*Total*
Avg years	7.4	5.9	7.9	6.7	7.2	6.2	5.9	7.1	*6.8*

[8] For a discussion on the arguments against systemic triggers, see IIF (2010).

[9] The sample excludes some major American investment banks, which are classified as securities firms.

Having said this, we still believe this is the right way to proceed given our goal. While a balanced panel would allow us to follow each bank over time, results would be affected by important structural changes – particularly the consolidation process – in virtually all the countries considered in the analysis. Moreover, the use of pro-forma data would not be appropriate for designing 'what if' regulatory scenarios: what we want to look at is the possible impact of contingent capital on real banks, not on pro-forma institutions.

Our initial dataset contains 15 banks per year per country, totalling about 1,700 records; since banks whose accounting data are missing are excluded, the number of observations in the final dataset is slightly lower. Data for 1994-96 tend to be less reliable and deserve some caution. Similarly, 2009 data are incomplete, particularly for some countries.

Quarterly data on GDP are from the OECD statistics. Market data and other financial variables – both bank-specific variables and system-wide indicators – are from Thomson-Reuters Datastream; accounting data are from Bureau van Dijk Bankscope. While the former are available at any desired frequency, the time series of the latter are annual only, at least for the earlier years. Therefore, market-based indicators are computed at a monthly frequency, while accounting ratios are annual. This is not ideal, since triggers for contingent capital should be monitored more frequently than once a year; however, we prefer to maximize the length of the time series rather than the frequency of the data.

Table 4 shows the possible triggers and describes how they are computed. As for the accounting bank-specific variables, we use the Basel Tier1 ratio, total capital ratio as well as the ratio of equity to total assets (a sort of leverage ratio for on-balance-sheet items), and the return on equity (ROE). They are all based on end-year data.

Table 4 – Possible triggers

Variable	Acronym	Description
Micro-triggers:		
Tier1 ratio	T1R	Ratio of Tier1 capital to Risk Weighted Assets
Total capital ratio	TCR	Ratio of Total capital to Risk Weighted Assets
Leverage ratio	ETA	Ratio of Equity to Total assets
Return on equity	ROAE	Return on average equity
Abnormal return (3 months)	Delta3m	Bank-j return minus bank index return over 3 months
Abnormal return (1 month)	Delta1m	Bank-j return minus bank index return over 1 month
Abnormal return (2 weeks)	Delta2w	Bank-j return minus bank index return over 2 weeks
Macro-triggers:		
Banking index return (3 months)	Indren3m	Stock-market national bank index return over 3 months
Banking index return (1 month)	Indren1m	Stock-market national bank index return over 1 month
Banking index return (2 weeks)	Indren2w	Stock-market national bank index return over 2 weeks
GDP gap	Hp_gap	Gross domestic product deviation from long term time trend (HP filtered series).
Normalized real interbank rate	Ib3cpr	3-month real interbank rate (difference between nominal rate and CPI), over one-side long-term average
Normalized 10 year- 3 month spread	S103r	Spread between the return of 10 year bond and 3 month bond, over one-side long-term average

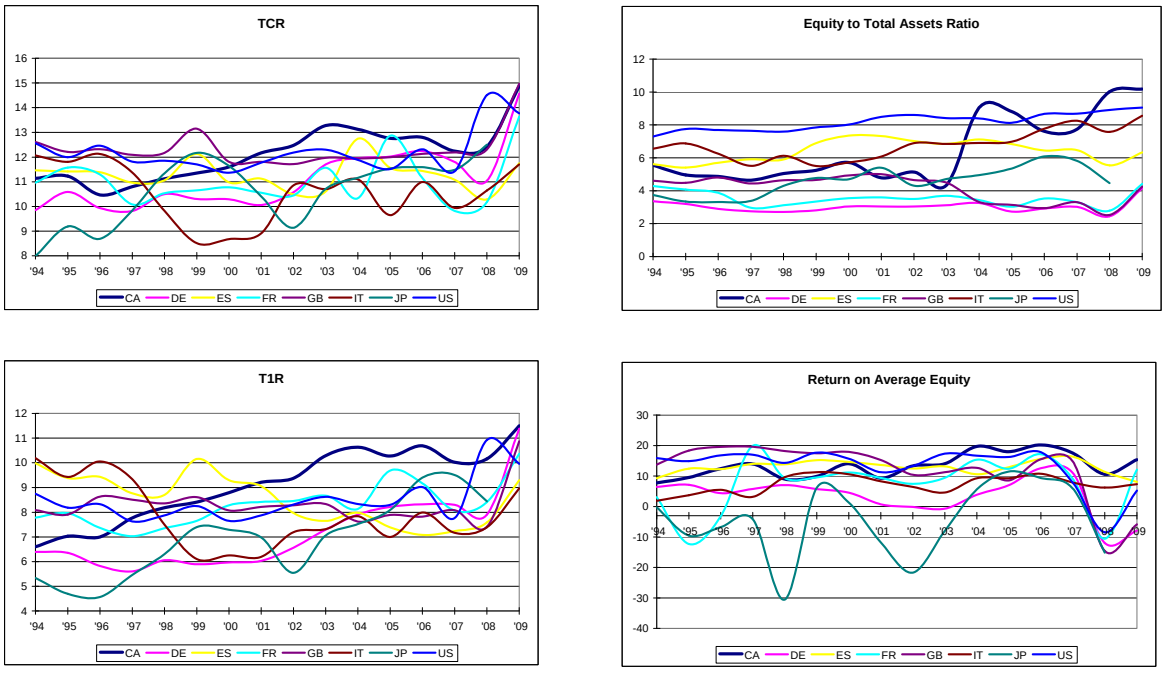
As for market-based bank-specific variables, we compute the abnormal returns (i.e. the difference between the return of each bank and the return of the Thomson-Reuters Datastream national banking index) over different time horizons (3 months, 1 month, 2 weeks).

With respect to absolute returns, the abnormal returns enable the idiosyncratic determinants of a bank's problem to be captured more effectively.[10] Wider time horizons tend to reduce the likelihood of trigger manipulation, since it can become very costly for arbitrageurs; however, this bears a cost in terms of the delay in transmitting distress signals. Therefore, in the next section we focus on the 2-week horizon, as Flannery does (2010).

For the macro-trigger, we start with the returns of the domestic banking indexes over different time horizons (3 months, 1 month, 2 weeks). We then move towards more genuinely macroeconomic indicators. We use the deviation of GDP from its trend, the real interbank rate over its long-term average and the spread between the return on 10-year and 3-month sovereign bonds over its long-term average.

Figure 1 depicts the dynamics of the accounting triggers for each country.

Figure 1 – Accounting triggers

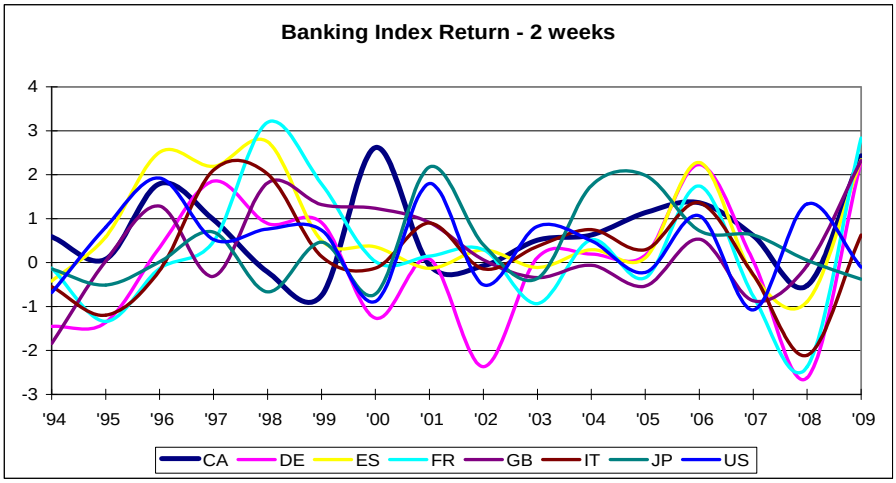


[10] See, among others, Cannata and Quagliariello (2005). We have excluded the volatilities since they are not easy to calibrate and their interpretation is not intuitive. CDS spreads – a popular early warning indicator – are also not included in the analysis. The reason is twofold: first, CDS markets are not always deep in all countries; second, the time series are not long enough.

The data highlight significant jumps for some time series and for certain countries (e.g., the equity to total ratio for Canadian banks in 2004). This is very often due to a few, specific observations. However, overly severe data cleaning may jeopardize the very core of the analysis – troubled banks – which are not easy to distinguish from 'authentic' outliers. Looking at the prudential variables, the levels are different due to heterogeneous eligibility criteria for capital instruments. For instance, banks in Canada, the US and the UK show persistently higher capital ratios.

Figure 2 shows the dynamics of the banking index return over a two-week time horizon.

Figure 2 – Example of a macro-trigger



Probability of conversion

In order to assess how different double triggers would have worked in the past, we run several simulations. While the results may be affected by the scarcity of data and the lack of a counterfactual, they provide an overview of the possible functioning of CCC.

For the analysis of the probability of conversion, we interpolate monthly data. In practice, we assume sticky bank-specific accounting variables (Tier1 ratio, total capital ratio, ROE and leverage ratio): they stay at the December figures for all the months in a given year. GDP gap, which can be computed on a quarterly basis, stays at its quarter-end figures during all months of a given quarter.

Under these approximations, we consider the double trigger infringed if both the bank-specific trigger and the macro-trigger simultaneously drop below the threshold in any one month of the year. We can therefore check how often a pair of triggers – bank specific and aggregate – would have been pulled in the 16 years under examination. In order to cope with banks for which the double trigger was activated more that once during a given year, we control out for infra-annual duplications at individual bank level, by considering

exclusively the first hit in a year. The exclusion of all duplicated annual records reduces the degree of over-estimation conversion probabilities.

Table 5 (panels a-h) reports the outcome of this exercise for different triggers and various thresholds. The calibration of the thresholds is based on the descriptive statistics and on some expert judgment.[11] For the sake of comparability, we used the same thresholds for all countries.

Table 5 about here

We interpret the historical frequency of breaches as the ex ante probability of being converted using a double trigger. For instance, for Italy (Panel a), the joint probability of a bank showing a total capital ratio below 9 per cent and the bank index return being below 2.5 per cent over a two-week horizon is 26 per cent. Turning to the Tier1 ratio as micro variable, the joint probability would be 20 per cent when this trigger is set at 6 per cent and 5 per cent when the threshold is 5 per cent. Looking at the interaction between the Tier1 ratio and GDP gap – a couple of indicators which have the advantage of being very easy to interpret – the probability of conversion is 3.7 per cent when thresholds are 5 per cent and 0 per cent (i.e., a positive output gap) respectively.

In order to understand the drivers of this outcome, the figures on the joint probabilities can be compared with the 'unconditional' probabilities of the two separate triggers. As far as the total capital ratio is concerned, the probability of not meeting a 9 per cent threshold is 26 per cent; running the same exercise for Tier1 ratio, probabilities are lower (20 and 5 per cent for thresholds equal to 6 and 5 per cent respectively). Not surprisingly, Tier1 is likely to be more informative than total capital ratio in terms of ability to signal bank problems.

The unconditional probabilities of pulling market-based indicators tend to be very high. For Italy, the probability of the index falling to more than -2.5 percent for at least 2 weeks over one year is 100 percent. This outcome is linked to the calibration of the simulation: a scenario of *at least* one bearish period (2 weeks, 1 month or 3 months respectively) in the whole year is likely to happen. In turns, these results highlight the importance of a careful calibration of the thresholds, which are probably too benign in our exercise. They also point to the role of the interplay between bank specific and aggregate triggers in the design of CCC.

Overall, in continental European countries, the double trigger based on the total capital ratios would be hit quite often, making contingent capital rather unappealing for subscribers. Again, the Tier1 ratio seems to be a much more reliable indicator; also, taken at their face value, these results suggest that a threshold at about 5 per cent can represent a suitable compromise (obviously under current capital regulation).

[11] See Claessens *et al.* (2010) for a discussion of the topic.

By contrast, prudential triggers are virtually never pulled for Canadian, US and UK intermediaries. Indeed, US major banks have historically shown high capital ratios, due to different eligibility standards across countries.[12] In that respect, pending new Basel rules on regulatory capital, market-based triggers may be a valuable alternative for those intermediaries. On the other hand, this may also indicate that a country-specific calibration of the trigger values would be more adequate than a 'one-size-fits-all' approach.

Similar results also hold when macroeconomic variables are used along with accounting ratios. For instance, a double trigger based on a Tier1 ratio below 5 per cent and GDP just below its trend shows a probability of being pulled equal to 5.8 per cent in Germany and 1.7 per cent in France (as against 3.7 per cent in Italy). Again, the probability of conversion is virtually zero in the US, Canada and the UK due to the dynamics of the capital ratios. Japan represents an outlier as the result of the 'lost decade' following the banking crisis in the 1990s.

Clearly, the milder the scenario, the higher the conversion probabilities, but the lower the potential losses for subscribers. By contrast, for very severe scenarios, the probability of conversion is extremely low, virtually zero, but subscribers may expect to bear losses upon conversion, depending also on the chosen conversion mechanism.[13] In our view, this is the main driver for choosing the preferred combination of thresholds. Needless to say, this also largely depends on the role and functioning of the countercyclical buffer that contingent capital is supposed to cover. We will discuss this in the next section.

Timing of conversion

What we have learnt in the previous section is the frequency of breaches of the trigger in terms of year/bank observations. However, we cannot assess whether this is due to the same bank over different years or different banks at a given point in time. The probability can be only considered an average probability on breaches for a given country, but no information on the cross-sectional dispersion can be inferred.

In this section, we examine *when* the triggers would have been hit in the past. Ideally, CCC should convert when bad times are approaching. To address this point, we analyse when a given combination of triggers would have determined a conversion. Figure 3 shows the results, at country level, based on four different combinations of triggers:

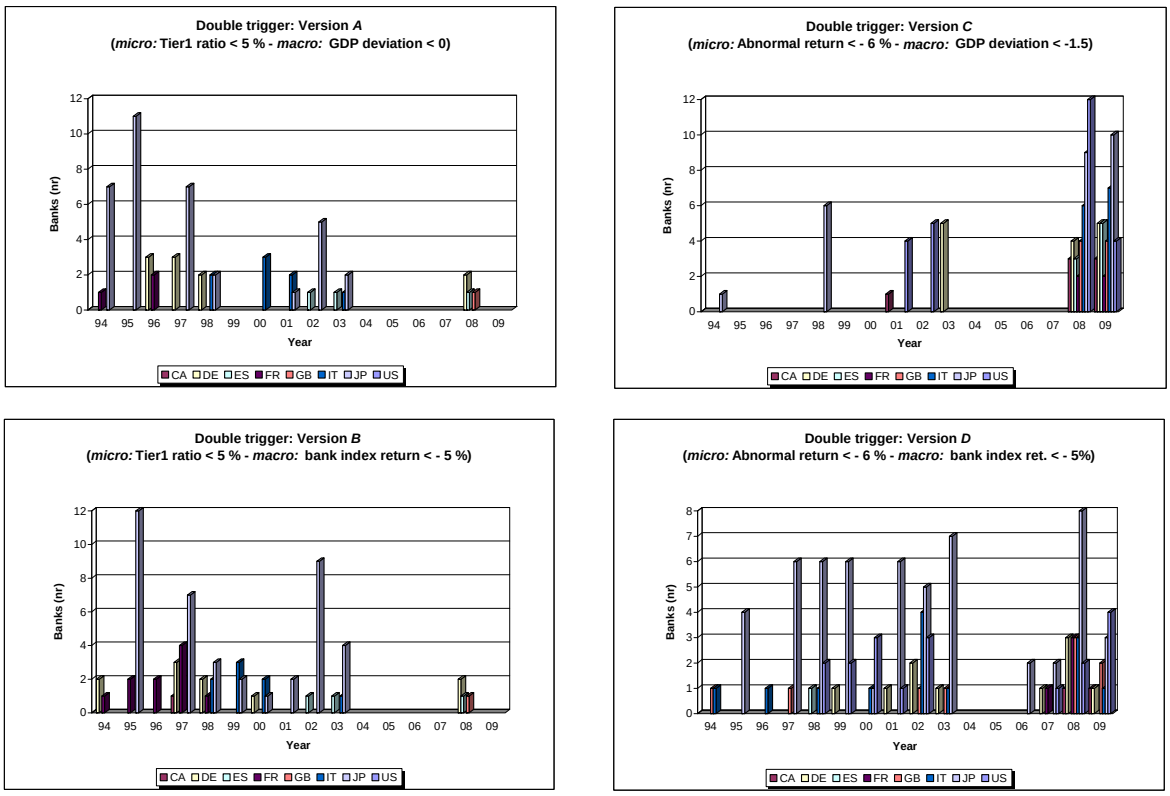
- *A*: Tier1 ratio below 5 per cent and GDP below its trend;

[12] Standard & Poor's (2009) argue that a big question for contingent capital is how the conversion trigger levels are set. Since capital ratios are typically not strictly comparable, they expect that any specific threshold could mean different things to different issuers.

[13] Since the abnormal return is affected, by construction, by the return of the bank index, the calibration should prevent an excessively severe calibration of both triggers from determining no conversion event. Therefore, if the scenario for the bank index is particularly severe, the threshold for the abnormal return should be set at a relatively low level.

- *B*: Tier1 ratio below 5 per cent and banking index return below -2.5 per cent;
- *C*: two-week abnormal return below -6 per cent and a 1.5 GDP gap;
- *D*: two-week abnormal and bank index returns below -6 per cent and -5 per cent respectively.

Figure 3 – Timing of conversion under 4 different combinations of double trigger



At first sight,[14] the combination between a market-based trigger and a macroeconomic trigger (*C*) seems to work more accurately, determining most of the conversion in severe economic recession episodes. Similarly, market-based triggers – even when roughly calibrated (*D*) – work fairly well, determining most of the conversions in market crisis times. By contrast, the dynamics of the double trigger based on prudential indicators is less clear-cut.

The aptitude of different indicators in successfully identifying troubled banks is also key. For this reason, we examine the ability of the different double triggers to successfully identify those banks that faced a situation of distress in the period from 2007-09. Drawing

[14] The dynamic of Japanese indicators shows some peculiarities, in the form of higher-than-average numbers of entries: an exhaustive explanation of the causes of this behaviour, exploring the roots of Japanese banking sector weakness and its linkages with the country's overall economic conditions, can be found in Reinhart and Rogoff (2009).

on Kaminsky and Reinhart (1999) and Borio and Drehmann (2009), we limit our exercise to two aspects: i) the ability to identify poorly performing banks, and ii) the cost of generating false alarms. In that respect, one has to trade off between Type I error (that is, not converting when needed) and Type II error (that is, converting when not required). The size of Type I and Type II error crucially depends on the calibration of the thresholds. A benign calibration is likely to identify many troubled banks, but at the cost of a lot of noise in terms of false alarms. On the other hand, an excessively severe calibration increases the accuracy, in terms of lower proportion of false signals, but at the risk of missing situations when conversion would be required.

We leverage on Laeven and Valencia (2010) for the definition of troubled banks. According to this approach, a distressed intermediary: i) operates in a country where there are significant signs of distress in the banking system; ii) did benefit from significant banking policy intervention measures. This definition is close to our quasi-default status, even though the micro-conditions are tighter than in our approach (where the banks are still in a going concern status). In 2007-09, they identify 5 countries with distressed banking sectors (France, Germany, Spain, the UK, the US); in these countries, they list 8 distressed banks.[15] We use this list of banks to analyse the performance of the four double triggers.

Results show how prudential-based triggers (versions A and B) would have been pulled for 4 banks only: one of them is a distressed bank according to Laeven and Valencia. Market-based triggers (versions C and D) would be triggered more often. Trigger C would have determined 25 conversions in 2008 and 20 in 2009: 4 distressed banks are captured among these observations. Finally, trigger D would have determined a lower total number of conversions (11 in 2008 and 7 in 2009), correctly identifying 4 distressed banks.[16]

To interpret these results, it is important to pay particular attention to the criterion of 'optimality' an indicator must have.[17] The reason is that the weight assigned to the risk of missing a 'quasi-default' situation may be higher than that of calling those when they do not eventually occur. If policy makers' first concern is to avoid under-capitalized banks when a systemic crisis is approaching, the preferences would go to an instrument that is able to identify troubled banks, even at the cost of high noise (in terms of a high number of

[15] These are: BNP Paribas, Société Générale, Dexia, Royal Bank of Scotland, LBG, Northern Rock, Bradford & Bingley and Citigroup. These banks are reported by Laeven and Valencia (2010) in the list of direct fiscal outlays, recoveries and asset guarantees during the years 2007-09.

[16] The definition of distressed bank is very tight. These results can thus overestimate Type II error since some 'triggered' banks, while not subject to bailouts or other policy measures, may have actually faced problems during the crisis. As a matter of fact, this analysis decisively depends on the list of distressed banks adopted as a control sample. The performance of the double triggers might increase the relaxation of the definition of distressed banks.

[17] This is in line with, among others, Borio and Drehmann (2009).

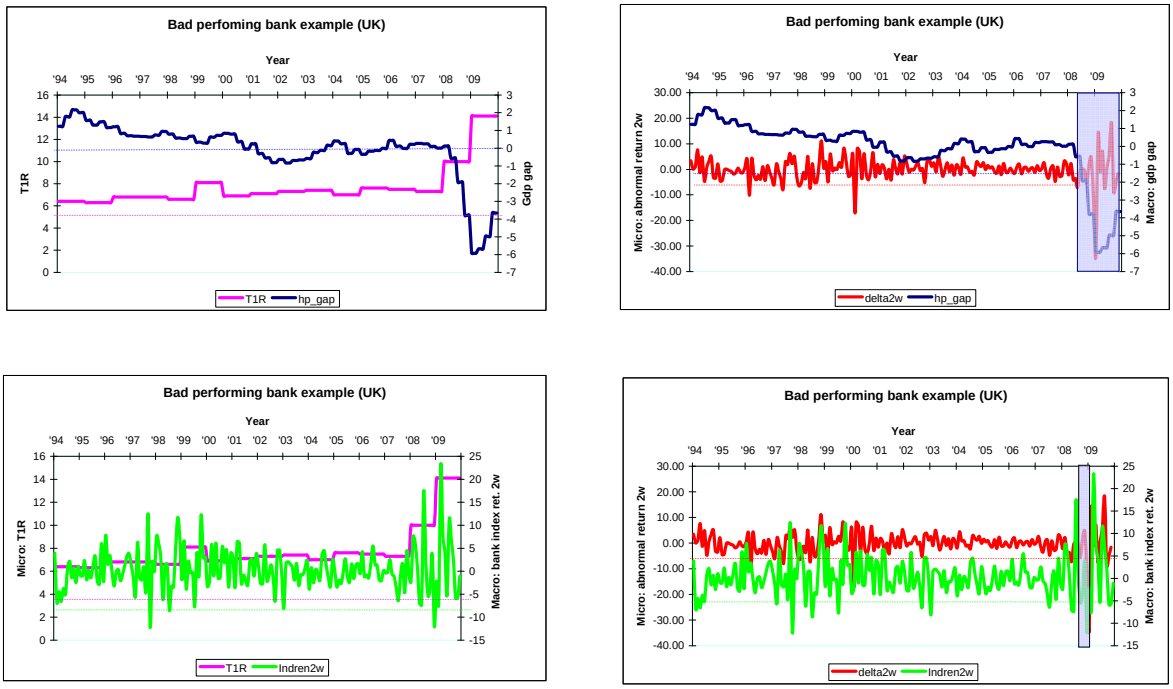
incorrect conversions). [18] In our example, market-based triggers appear to perform better in this respect.

Case studies

In order to show how CCC would perform at bank level in 'real life' situation, we present four case studies. These examples mimic the functioning of CCC for four different banks, with two selection criteria: geo-political background (UK, US and Canada vs. continental European country) and performance during the last financial crisis (that is, institutions which according to Leaven and Valencia (2010) were sound vs. distressed banks, those directly involved in a systemic banking crisis episode). We limit our exercise to the four different versions of double trigger examined above. The result of the case studies analysis is described in Figures 4 to 7.

The charts describe the dynamic of both micro- and macro-trigger variables for a given bank. Moreover, for the threshold values used before in Figure 3, they highlight periods where the double trigger would have been pulled.

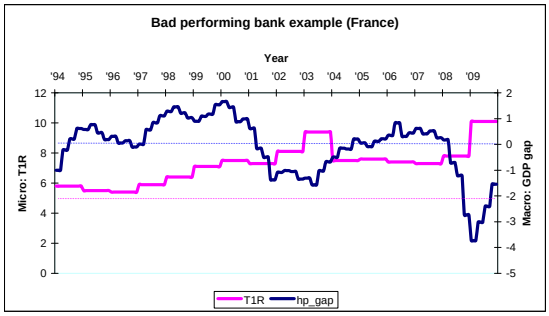
Figure 4 – Poorly performing bank (UK)

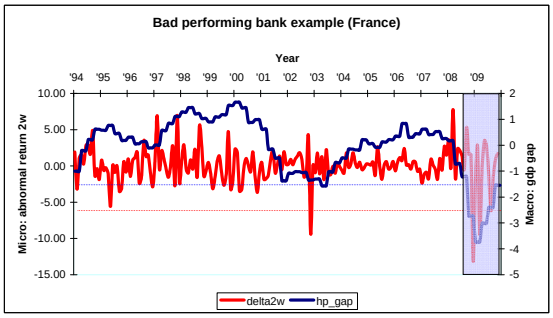


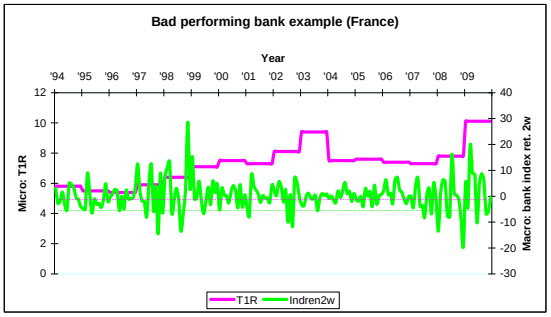
Solid lines represent micro variable (lhs) and macro variable (rhs) levels; dotted lines refer to trigger values; shaded areas represent periods in which double trigger was pulled

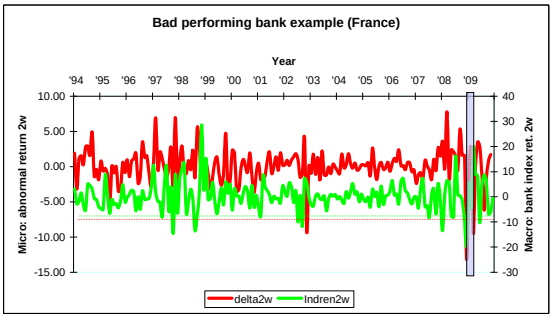
[18] McDonald (2010) underlines how this is particularly true of contingent capital: if it converts when not required, then the bank is – by definition – healthy and, in an efficient market setting, it should be able to repurchase the newly converted shares, funding it by a new issuance of contingent capital.

Figure 5 – Poorly performing bank (France)



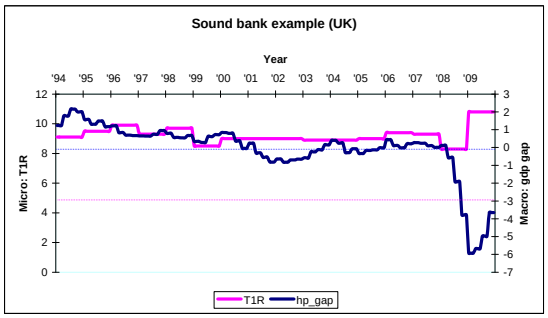


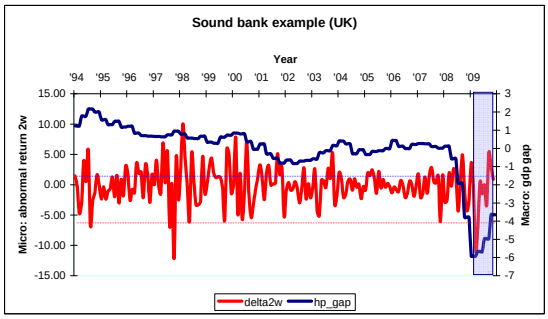


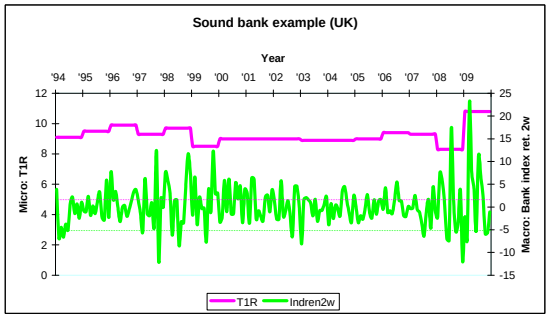


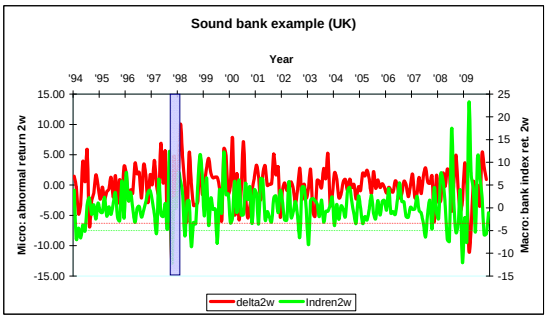
Solid lines represent micro variable (lhs) and macro variable (rhs) levels; dotted lines refer to trigger values; shaded areas represent periods in which double trigger was pulled

Figure 6 – Sound bank (UK)



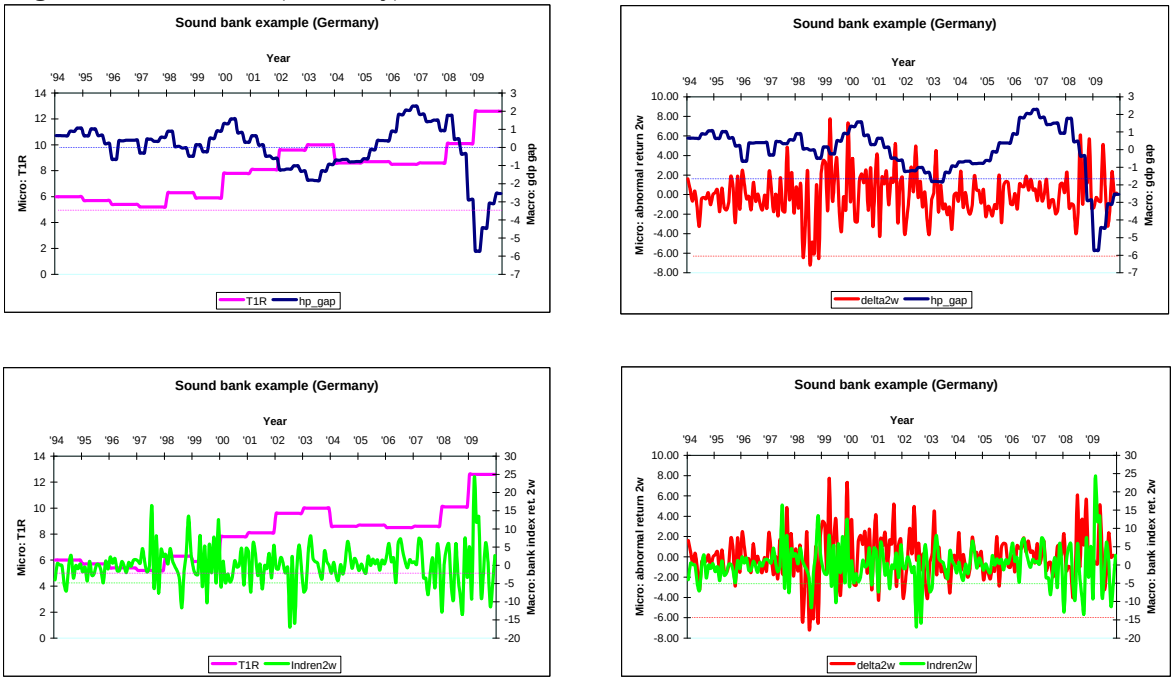






Solid lines represent micro variable (lhs) and macro variable (rhs) levels; dotted lines refer to trigger values; shaded areas represent periods in which double trigger was pulled

Figure 7 – Sound bank (Germany)



Solid lines represent micro variable (lhs) and macro variable (rhs) levels; dotted lines refer to trigger values; shaded areas represent periods in which double trigger was pulled

The results of the case studies provide messages that are consistent with the ones already described. First, the data confirm that triggers based on Tier1 ratio are pulled extremely rarely: in all four examples, they would never be activated. More specifically, this result applies both to sound banks (as expected) and to poorly performing banks, confirming the findings of the previous sections about the rarity of their activation.

On the other hand, market-based indicators successfully identify poorly performing banks' distress situations, irrespective of their geo-political background. However, this accuracy does not come without a cost: in this example, represented by the false alarm for the UK sound bank.

Policy implications

Our analysis offers two insights. First, bank-specific market triggers appear to work relatively better than accounting ones, particularly in some countries. The better performance of market-based indicators must, however, be traded-off with greater volatility and the risk of manipulation. Moreover, the scarce liquidity and efficiency of financial markets in some countries may limit a widespread use of such triggers. Regarding their ability to identify systemic crisis episodes, it seems that they work appropriately, although determining a high number of conversions and thus acting as an excessively blunt instrument.

Second, the frequency of triggers' monitoring does matter and may entail significantly different probabilities of conversion. In real life, while banks are required to meet minimum

capital requirements at any time, prudential ratios are made available to supervisors on a (at most) quarterly basis (and can be lagging indicators). Therefore, one possible option is for authorities to monitor the evolution of the macro-triggers and, when they signal incoming distress, require banks to transmit information on the prudential ratios. This may not be very practical, though. Otherwise, any monitoring must necessarily be carried out on a quarterly basis. In that respect, it is clear that the use of micro-triggers based on market indicators may be very appealing if timeliness is a top priority.

While these results are preliminary and are affected by various approximations, they somehow challenge the use of prudential ratios as a micro-component of the double trigger. Moreover, the analysis shows that CCC triggers may be difficult to calibrate, particularly if cross-border comparability is a priority for regulators.

Much more investigation is needed on these issues.

8. The definition of conversion mechanisms

The conversion mechanism of contingent capital is another important determinant of its marketability. In fact, the conversion rate determines the number of common shares that the holders of convertible debt receive when the triggering event occurs. The conversion rate accordingly determines the share of losses that subscribers and existing shareholders bear.[19]

The number of shares received by the holder of contingent capital can be either: a) prefixed at issuance; or b) determined at the time of conversion. The choice very much depends on the policy objectives and, particularly, on which stakeholders are to be punished more for their role in determining the event that pulled the trigger.

Conversion into a number of shares prefixed at issuance. The number of shares received by the CCC holders when conversion is triggered could be determined by dividing:

1. the par value of the instrument by the share price of the bank at the time of issuance of the instrument.

This option implies a fixed number of shares agreed when the capital instrument is issued. In terms of impact on the stakeholders, this is a rather extreme solution. This mechanism implies that debt holders receive a predefined number of shares. Suppose that a bank has issued a 20-years, 1,000 euros par value bond; at time of issuance, the stock price of the bank is 50 euros; debt holders know from the outset that they will receive 20 shares (1,000 / 50) upon conversion. The distribution of penalties is very burdensome for them. Now, assume that the share price at conversion has dropped to 25 euros, converted debt holders will receive 20 shares in any event, bearing losses as if they had been shareholders from the beginning. By contrast, shareholders are better off: upon conversion, they are diluted to a limited and predefined extent and they share losses with fixed-income investors. For these

[19] The drawbacks of this incentive structure are highlighted by Sundaresan and Wang (2010).

reasons, this instrument would be rather expensive and its cost much more closely correlated to the cost of equity.[20]

This option may potentially increase market discipline, since convertible debt holders would also have strong incentives to monitor the bank. A potential drawback, however, is that this mechanism may imply contagion among different categories of investors. The stability of fixed-income investors that subscribed to contingent capital may be jeopardized. From a governance perspective, it is not clear why debt holders should be penalized as much as shareholders.

Conversion into a number of shares defined at the time of conversion. The number of shares to be given to the bond-holder may be determined by dividing:

2. the par value of the instrument by the share price of the bank at the time of conversion;
3. the par value of the instrument by the book value per common share at the time of conversion;

In option 2, when the conversion is triggered, if the share price of the bank has dropped (as it is reasonable to expect), the holders of contingent capital receive the notional amount of the converted instrument in shares. In the example illustrated above, let's assume that, at the time of conversion, the stock price is 25 euros, so that the bondholders receive 40 shares (1,000 / 25). If they manage to sell the shares immediately at 25 euros, they do not suffer any loss and they can buy new convertible debt, to keep their investment profile unchanged. If they do not, they start taking equity risk only from the exact moment the debt is converted.

On the other hand, existing shareholders are strongly penalized due to significant dilution of their ownership. The lower the market value of shares, the higher the dilution. In that respect, this conversion mechanism entails consequences that are very close to what would happen in liquidation: existing shareholders bear losses before subordinated debt holders. From the governance perspective, shareholders are penalised for not having properly controlled managers; debt holders start to take an equity risk only after conversion.

A potential disadvantage of this mechanism is that it could lead to the issuance of a near infinite number of shares (for instance due to death spirals). Imagine the above bank issuing the bond in good times with a 50 euros ordinary share price, at the very moment when triggers are hit, the share price is five cents. Running a market price conversion in this case would result in the converting instrument holders potentially owning the bank; it would also materially complicate any private sector capital injection, due to the 'wallpapering' effect of issuing a near infinite number of ordinary shares to the converting holders. One possible solution is to set a floor on the share price used in the conversion. For example, a floor can be set at 25 per cent of the bank's share price at the time of contingent capital

[20] This is the approach adopted for CRD2 convertible Tier1 hybrids, according to CEBS guidelines.

issuance (25 per cent * 50 = 12.5); this is equivalent to setting a cap on the number of shares: upon conversion, the maximum number of shares that investors can receive is 80 (1,000 euros / 12.5). This would also mitigate the dilution.

Another shortcoming of this conversion mechanism is that it may determine death spirals when, after conversion, CCC subscribers start selling their shares. A 'lock-up' clause, prohibiting them from selling converted shares for a predefined period of time, may overcome this problem, but would increase the risk of contagion from banks to CCC investors[21].

In option 3 debt holders receive a number of shares, which is not linked to their fair value. For instance, if the nominal value of each share is 10 euros and does not change over time, at conversion investors receive 100 shares, implying a potential gain or loss depending on the market price of the shares after conversion. This conversion methodology might perhaps be useful for non-joint stock companies, given that retained earning are generally not available to shareholders.

The capital increase can also be achieved, as in the Rabobank case, through a permanent (total/partial) write-down of the original instrument which is (partially) extinguished. This option is somehow peripheral and has the advantage that no new shares are issued. In this case, the total write-down of the nominal value of a convertible debt generates a correspondent gain and a consequential increase in retained earnings. In our example, after issuing the par value 1,000 euros bond, the bank has a liability in its balance sheet for 1,000 euros. When the trigger is pulled, debt is written down, the liability is (permanently) extinguished and there is an increase in reserves (+ 1,000 euros).

This mechanism does not meet the hierarchy in the allocation of losses that occurs in liquidation: in fact, it may well happen that a debt holder is fully written down before shareholders bear losses and are wiped out. Moreover, the contingent capital with write-down does not give investors any upside but a brutal 100 per cent loss. As for shareholders, for them this is the first best option, because with a permanent write-down dilution is completely avoided.

For these reasons, the marketability of these instruments is uncertain: much probably depends on how the structure of triggers is defined; if this is calibrated in order to represent a low-probability, high-severity event, it might possibly work. A possible way to mitigate this issue is to reduce the write-down (as in the Rabobank structure), for example assuming a permanent partial write-down (75 per cent). One potential advantage of this option is that it is easier for fixed-income investors to keep these instruments in their portfolios.

In light of the above, we think that the most convincing mechanism is the one based on a capped variable number of shares, which penalizes the shareholdings more, but avoids

[21] An alternative is the Call Option Enhanced Reverse Convertible (COERC) proposed by Pennacchi *et al*. (2010). For COERC, conversion price is set significantly below the trigger price and equity holders have the option to buy back the shares from the bondholders at the conversion price.

wallpapering. Option 2 with a cap on the maximum number of shares to be issued upon conversion is therefore our preferred option. The risk of dilution poses correct incentives for existing shareholders to monitor managers, in order to prevent the trigger from being pulled. At the same time, since the cap entails that debt holders may also suffer some losses, there is an increase in market discipline. However, it is an open issue whether conversion mechanisms should be determined by prudential regulation or rather left to bargaining between issuers and subscribers.

All in all, option 2 with a cap is probably the most consistent with the structure of powers and responsibilities assigned to the different stakeholders. It also reduces equity risk for fixed-income investors, thus minimizing possible contagion across different categories of investors when the trigger is activated. We acknowledge that, if the firm-specific trigger is defined in terms of market variables (the stock price of the bank), there may be room for manipulation. However, the double trigger should lessen the possibilities of gaming.

Whatever conversion rate is chosen, the bank has to maintain at all times prior authorization (e.g., shareholders' approval) to immediately issue the relevant number of shares specified in the instrument's terms and conditions, should conversion be triggered.

9. Prudential treatment

As for the prudential treatment, it is very important to keep firmly in mind the objective of the instrument, i.e., to contribute to the build up of countercyclical capital buffers to be used in bad times.

In fact, the revision of the Basel framework is clearly moving towards a new set of capital standards, including time-invariant minima and countercyclical buffers (BCBS 2009, 2010). As we mentioned, the two categories of requirements should be kept distinct from one another.

In that respect, the issuance of contingent capital instruments in good times, (not included in supervisory capital before conversion) allows banks to accumulate a capital buffer in good times, i.e. when it is possible, easier and less costly; when the triggers are pulled, this instrument is extinguished and through conversion (or write-downs) new capital flows into the bank at precisely the moment it is needed.[22]

We therefore believe that banks should be allowed – not obliged – to use CCC for meeting the buffer requirement before conversion, even though it would not be eligible for meeting minimum capital requirements. In order to avoid double counting, a bank's holding in CCC of another bank should be deducted from its own CCC.

As regards the features required for these instruments: they have to be paid fully at issuance (i.e., no unfunded instruments allowed) to avoid counterparty credit risk and

[22] With respect to the conversion of Tier1 hybrids, this is 'truly' new regulatory capital flowing in.

prevent contagion effects when the trigger is pulled; they should be either perpetual or at least long dated and permanent in order to avoid the risk of rollover. Flexibility of payments does not seem to be relevant to the extent that such instruments are used to meet the buffer requirement.[23]

After conversion (or write-down) of the instrument, the contingent capital would disappear, with the bank having more common equity to rely on. Where provided for by the regulation, the fit and proper test for shareholders would be carried out at conversion. Failure to comply with the test may result, for instance, in the suspension of voting rights.

In short, CCC might effectively cover countercyclical capital buffers, in particular what the Basel Committee calls the buffer for dealing with excessive credit growth. Since these buffers are to be accumulated in good times and released in bad times (i.e., in bad times banks are not required to hold the buffer), CCC seems a reasonable option for banks and might be acceptable for supervisors. In practice, in good times the buffer would be accumulated through the issuance of contingent capital; when the cycle reverses, banks would no longer be requested to accumulate buffers and convert contingent capital in order to: i) cover losses; ii) absorb the increase of minimum capital requirements; iii) continue granting credit. In this case, the triggers for converting contingent capital can be calibrated in order to serve also as triggers for the release of the countercyclical buffer. With respect to the current proposals of the Basel Committee, however, this would imply bank-specific buffers.

10. Conclusions

In this paper, we discuss the possibility of introducing contingent capital for covering capital needs arising from the implementation of countercyclical buffers. We propose a double trigger in the conversion, which would be required when simultaneously: a) the financial system is facing systemic distress; and b) the individual bank – while still in a going concern status – shows weaknesses.

We test double triggers based on both accounting and market variables for the micro-component. The main result of our analysis is that there may be room for countercyclical contingent capital, although the calibration of the triggers is a challenging task.[24] The choice of the most appropriate threshold (i.e., of the severity of triggering events) – which is very much affected by data availability – depends on the characteristics and role of the buffer that contingent capital is supposed to cover. Our assessment also suggests that

[23] In essence flexibility of payments (ability to cancel/defer coupon payments) provides a (limited) loss absorption, as it enables banks to prevent cash outflows in times of stress.

[24] The difficulties in identifying coincident indicators of bank distress are acknowledged by the BCBS (2010). In its proposal for a countercyclical buffer, the Committee did not select a specific variable, but rather left to authorities' discretion the identification of 'bad times', when banks are allowed to release the buffers accumulated during booms.

country-specific thresholds may be preferable. Another outcome is that the prudential ratios, while less prone to manipulation, are available at low frequencies, a serious drawback if prompt conversion is needed. They are also affected by heterogeneous eligibility criteria for capital instruments across jurisdictions. However, under the proposed new definition of regulatory capital, the identification of common thresholds may be more workable for prudential triggers too.

In terms of the conversion mechanism, we support the approach based on a variable number of shares, which penalizes shareholdings more, with a cap that avoids wallpapering. Depending on the severity of the scenario that triggers the conversion, this may significantly limit the risk for contingent capital subscribers, thus reducing possible contagion from issuers to holders. The risk of cross-sectional procyclicality should also be reduced given that such instruments are fully paid at issuance.

As for prudential treatment, we believe banks should be allowed to use contingent capital for meeting the buffer requirement before conversion; however, contingent capital would not be eligible as regulatory capital and it would not accordingly be available for meeting minimum capital requirements. After conversion, the contingent capital would fade out, leaving the bank with an increased quantity of common equity to rely on.

In taking the decision on the possible use of contingent capital for prudential purposes, regulators will trade-off the potential benefits of this tool and the risk that a complex design leaves room for excessive financial innovation and arbitrage opportunities. To what extent CCC design is consistent with the willingness of the supervisory community to keep capital instruments as simple as possible remains an open issue.

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Table 5 – Panel A

Historical joint probability of different triggers combinations
Country = Italy; Frequency = monthly (with no duplications)

		Macro trigger																	
		bank index return 2 weeks			bank index return 1 month			bank index return 3 months			gdp deviation from hp trend			normalised real interbank rate			normalised 10Y-3M sov. spread			Unconditional
Micro trigger	value:	-4.9	-3.7	-2.5	-10	-7.5	-5	-20	-15	-10	-1.5	-1	0	1.25	1	0.75	1.5	1.2	0.9	probability
abnormal return 2 weeks	-6	*11.9*	*14.2*	*17.9*	*14.2*	*14.9*	*18.7*	*14.2*	*16.4*	*20.9*	*8.6*	*11.2*	*35.5*		*8.6*	*19.1*	*24.3*	*29.6*	*36.2*	*47.0*
	-4	*24.6*	*27.6*	*34.3*	*21.6*	*24.6*	*31.3*	*17.2*	*21.6*	*26.9*	*12.5*	*17.8*	*53.3*		*15.1*	*30.9*	*36.2*	*45.4*	*57.9*	*80.6*
	-2	*41.8*	*50.7*	*59.0*	*24.6*	*30.6*	*48.5*	*19.4*	*28.4*	*35.1*	*17.1*	*20.4*	*79.6*		*19.7*	*41.4*	*55.9*	*64.5*	*81.6*	*99.9*
abnormal return 1 month	-10	*7.2*	*8.0*	*10.1*	*5.1*	*7.2*	*8.7*	*5.8*	*7.2*	*10.1*	*8.1*	*10.6*	*25.5*		*4.3*	*11.8*	*19.3*	*23.0*	*26.1*	*37.0*
	-7.5	*13.0*	*14.5*	*18.1*	*9.4*	*10.9*	*14.5*	*9.4*	*13.8*	*17.4*	*12.4*	*15.5*	*37.9*		*6.2*	*16.1*	*29.8*	*34.8*	*41.0*	*54.3*
	-5	*24.6*	*29.0*	*36.2*	*14.5*	*15.9*	*26.1*	*13.0*	*18.8*	*22.5*	*14.9*	*18.6*	*57.8*		*14.3*	*28.0*	*44.1*	*49.7*	*60.9*	*82.6*
abnormal return 3 months	-20	*3.8*	*3.8*	*4.5*	*1.9*	*4.5*	*4.5*	*1.3*	*1.3*	*1.9*	*5.0*	*5.6*	*8.1*		*1.9*	*3.7*	*8.7*	*11.8*	*12.4*	*14.1*
	-15	*7.7*	*9.0*	*10.9*	*5.1*	*8.3*	*10.9*	*3.8*	*4.5*	*5.1*	*7.5*	*8.7*	*19.3*		*3.7*	*8.7*	*17.4*	*20.5*	*23.6*	*32.1*
	-10	*13.5*	*16.7*	*23.1*	*9.6*	*14.1*	*19.2*	*6.4*	*7.7*	*10.3*	*11.2*	*14.3*	*36.6*		*9.3*	*21.7*	*31.1*	*34.8*	*42.9*	*62.2*
equity/total assets	2	*1.3*	*1.3*	*1.3*	*0.4*	*0.9*	*0.9*	*0.4*	*0.4*	*0.4*	*0.8*	*0.8*	*1.3*		*0.4*	*0.4*	*1.3*	*1.3*	*1.3*	*1.3*
	3	*2.2*	*2.7*	*3.1*	*0.4*	*0.9*	*0.9*	*0.4*	*0.4*	*0.9*	*0.8*	*0.8*	*2.5*		*0.8*	*1.7*	*1.3*	*1.7*	*2.5*	*3.1*
	4	*4.4*	*4.9*	*5.3*	*1.3*	*1.8*	*2.2*	*0.9*	*1.3*	*1.8*	*0.8*	*0.8*	*4.6*		*1.3*	*2.9*	*1.7*	*2.1*	*4.2*	*5.3*
return on equity	-22.5	*1.3*	*1.3*	*1.3*							*0.4*	*0.4*	*1.3*			*0.8*	*0.4*	*0.4*	*1.3*	*1.3*
	-12.5	*2.2*	*2.2*	*2.7*		*0.4*	*0.9*			*0.4*	*0.4*	*0.4*	*2.1*		*0.8*	*1.7*	*1.3*	*1.7*	*2.5*	*2.7*
	-7	*2.2*	*2.2*	*2.7*		*0.4*	*0.9*			*0.4*	*0.4*	*0.4*	*2.1*		*0.8*	*1.7*	*1.3*	*1.7*	*2.5*	*2.7*
tier 1 ratio	4	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*		*0.5*	*0.5*			*0.5*				*0.5*	*0.5*	*0.5*	*0.5*
	5	*4.0*	*5.0*	*5.0*	*4.5*	*4.5*	*4.5*	*2.0*	*3.5*	*3.5*	*0.5*	*0.5*	*3.7*			*0.9*	*3.7*	*3.7*	*4.7*	*5.0*
	6	*16.0*	*19.0*	*20.0*	*13.5*	*15.5*	*16.0*	*7.5*	*10.5*	*12.0*	*1.9*	*1.9*	*15.0*		*2.8*	*6.1*	*14.5*	*15.4*	*17.8*	*20.0*
total capital ratio	8	*2.5*	*3.0*	*3.0*	*2.0*	*2.0*	*2.5*	*1.0*	*1.5*	*2.0*			*2.3*		*0.5*	*1.4*	*1.9*	*1.9*	*2.8*	*3.0*
	9	*20.5*	*24.0*	*25.5*	*16.5*	*17.5*	*19.5*	*7.5*	*11.0*	*14.5*	*1.4*	*1.4*	*17.8*		*5.1*	*11.7*	*16.8*	*18.2*	*21.5*	*25.5*
	10	*43.0*	*51.5*	*56.0*	*26.5*	*32.5*	*38.0*	*15.0*	*20.0*	*27.5*	*5.6*	*5.6*	*42.1*		*14.5*	*25.2*	*34.1*	*38.3*	*45.8*	*56.0*
Unconditional probab.		*81.3*	*93.8*	*100.0*	*43.8*	*56.3*	*68.8*	*31.3*	*37.5*	*50.0*	*18.8*	*18.8*	*81.3*		*31.3*	*50.0*	*62.5*	*68.8*	*87.5*	

Table 5 – Panel B

Historical joint probability of different triggers combinations
Country = Germany; Frequency = monthly (with no duplications)

		Macro trigger																	
		bank index return 2 weeks			bank index return 1 month			bank index return 3 months			gdp deviation from hp trend			normalised real interbank rate			normalised 10Y-3M sov. spread			Unconditional probability
Micro trigger	value:	-4.9	-3.7	-2.5	-10	-7.5	-5	-20	-15	-10	-1.5	-1	0	1.25	1	0.75	1.5	1.2	0.9	
abnormal return 2 weeks	-6	*9.4*	*14.2*	*17.0*	*9.4*	*13.2*	*18.9*	*12.3*	*14.2*	*18.9*	*13.2*	*18.9*	*35.8*	*8.5*	*14.2*	*41.5*	*4.7*	*8.5*	*25.5*	*50.0*
	-4	*18.9*	*23.6*	*26.4*	*14.2*	*22.6*	*33.0*	*16.0*	*20.8*	*26.4*	*15.1*	*22.6*	*54.7*	*14.2*	*29.2*	*60.4*	*9.4*	*16.0*	*43.4*	*79.2*
	-2	*26.4*	*34.9*	*40.6*	*22.6*	*32.1*	*44.3*	*22.6*	*29.2*	*37.7*	*16.0*	*24.5*	*66.0*	*22.6*	*37.7*	*76.4*	*16.0*	*32.1*	*63.2*	*98.1*
abnormal return 1 month	-10	*10.3*	*12.0*	*16.2*	*6.8*	*10.3*	*12.8*	*11.1*	*17.9*	*20.5*	*10.7*	*17.4*	*31.4*	*6.6*	*13.2*	*31.4*	*5.0*	*8.3*	*21.5*	*44.4*
	-7.5	*12.0*	*17.1*	*23.9*	*9.4*	*12.8*	*17.1*	*14.5*	*21.4*	*23.1*	*10.7*	*17.4*	*38.8*	*10.7*	*20.7*	*45.5*	*5.8*	*14.9*	*30.6*	*60.7*
	-5	*20.5*	*27.4*	*40.2*	*14.5*	*23.1*	*29.1*	*19.7*	*24.8*	*29.1*	*14.0*	*22.3*	*50.4*	*15.7*	*31.4*	*62.8*	*7.4*	*18.2*	*43.0*	*82.9*
abnormal return 3 months	-20	*9.5*	*10.3*	*12.1*	*6.0*	*8.6*	*9.5*	*6.0*	*7.8*	*7.8*	*8.3*	*10.0*	*17.5*	*3.3*	*6.7*	*15.0*	*3.3*	*5.8*	*19.2*	*25.9*
	-15	*12.9*	*13.8*	*19.0*	*7.8*	*11.2*	*13.8*	*8.6*	*10.3*	*12.9*	*9.2*	*12.5*	*24.2*	*6.7*	*13.3*	*29.2*	*3.3*	*8.3*	*26.7*	*40.5*
	-10	*19.0*	*22.4*	*28.4*	*11.2*	*18.1*	*20.7*	*13.8*	*15.5*	*19.0*	*11.7*	*15.8*	*38.3*	*10.8*	*20.0*	*44.2*	*6.7*	*13.3*	*35.0*	*59.5*
equity/total assets	2	*9.3*	*11.9*	*11.9*	*7.1*	*8.0*	*11.9*	*5.3*	*6.2*	*9.3*	*5.0*	*5.4*	*10.4*	*5.0*	*7.1*	*12.1*	*3.8*	*6.3*	*9.6*	*14.2*
	3	*35.0*	*45.6*	*45.6*	*24.3*	*28.3*	*45.6*	*18.6*	*22.6*	*35.0*	*10.0*	*13.3*	*37.1*	*12.9*	*22.1*	*46.7*	*12.5*	*22.9*	*37.9*	*54.0*
	4	*56.2*	*73.0*	*73.0*	*40.3*	*46.0*	*73.0*	*28.3*	*34.1*	*55.8*	*14.6*	*20.0*	*57.5*	*20.8*	*36.3*	*74.6*	*18.3*	*34.2*	*61.3*	*85.8*
return on equity	-22.5	*2.7*	*2.7*	*2.7*	*2.7*	*2.7*	*2.7*	*2.2*	*2.2*	*2.7*	*2.5*	*2.5*	*3.8*	*2.5*	*2.5*	*3.3*	*1.3*	*1.3*	*2.5*	*3.5*
	-12.5	*6.2*	*6.6*	*6.6*	*4.9*	*6.2*	*6.6*	*5.8*	*5.8*	*6.6*	*5.4*	*6.3*	*7.9*	*3.3*	*3.3*	*6.3*	*2.1*	*3.8*	*5.8*	*7.5*
	-7	*8.0*	*8.8*	*8.8*	*6.2*	*8.0*	*8.8*	*7.5*	*7.5*	*8.8*	*7.1*	*7.9*	*10.0*	*4.6*	*4.6*	*7.9*	*2.1*	*4.6*	*6.7*	*9.7*
tier 1 ratio	4	*1.3*	*1.3*	*1.3*	*1.3*	*1.3*	*1.3*	*1.3*	*1.3*	*1.3*	*1.2*	*1.2*	*1.2*	*1.2*	*1.2*	*1.2*				*1.3*
	5	*6.3*	*7.5*	*7.5*	*5.0*	*5.0*	*7.5*	*2.5*	*2.5*	*4.4*	*1.2*	*1.2*	*5.8*	*1.8*	*4.7*	*8.8*	*4.1*	*5.8*	*6.4*	*10.1*
	6	*26.4*	*32.1*	*32.1*	*22.0*	*22.6*	*32.1*	*10.7*	*11.3*	*20.8*	*1.8*	*3.5*	*23.4*	*6.4*	*15.2*	*34.5*	*12.3*	*18.1*	*28.1*	*37.7*
total capital ratio	8	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*1.1*	*1.1*	*2.9*	*2.3*	*2.3*	*2.9*	*0.6*	*0.6*	*1.7*	*3.1*
	9	*9.9*	*11.1*	*11.1*	*8.6*	*8.6*	*11.1*	*4.9*	*4.9*	*7.4*	*1.1*	*1.7*	*9.2*	*3.4*	*7.5*	*12.6*	*4.0*	*6.3*	*9.2*	*14.2*
	10	*28.4*	*32.7*	*32.7*	*22.8*	*24.1*	*32.7*	*13.0*	*14.2*	*24.1*	*4.0*	*6.3*	*24.7*	*8.6*	*16.7*	*35.1*	*10.9*	*16.1*	*27.0*	*38.3*
Unconditional probab.		*67.9*	*86.7*	*86.7*	*49.2*	*55.4*	*86.7*	*37.1*	*43.3*	*68.3*	*18.8*	*25.0*	*67.9*	*25.0*	*43.3*	*86.7*	*25.0*	*43.3*	*74.6*	

Table 5 – Panel C

Historical joint probability of different triggers combinations
Country = Spain; Frequency = monthly (wih no duplications)

		Macro trigger																	
		bank index return 2 weeks			bank index return 1 month			bank index return 3 months			gdp deviation from hp trend			normalised real interbank rate			normalised 10Y-3M sov. spread			Unconditional probability
Micro trigger	value:	-4.9	-3.7	-2.5	-10	-7.5	-5	-20	-15	-10	-1.5	-1	0	1.25	1	0.75	1.5	1.2	0.9	
abnormal return 2 weeks	-6	*1.2*	*4.8*	*6.0*	*6.0*	*8.4*	*10.8*	*4.8*	*12.0*	*14.5*	*9.6*	*9.6*	*16.9*	*1.2*	*4.8*	*12.0*	*9.6*	*13.3*	*22.9*	*32.5*
	-4	*6.0*	*12.0*	*16.9*	*13.3*	*16.9*	*20.5*	*9.6*	*18.1*	*21.7*	*12.0*	*12.0*	*25.3*	*1.2*	*8.4*	*21.7*	*15.7*	*25.3*	*39.8*	*60.2*
	-2	*16.9*	*26.5*	*37.3*	*21.7*	*31.3*	*41.0*	*14.5*	*26.5*	*33.7*	*14.5*	*14.5*	*38.6*	*3.6*	*15.7*	*43.4*	*25.3*	*42.2*	*60.2*	*95.2*
abnormal return 1 month	-10		*2.3*	*3.4*		*1.1*	*1.1*	*3.4*	*5.7*	*5.7*	*7.4*	*8.5*	*14.9*	*2.1*	*5.3*	*7.4*	*6.4*	*8.5*	*13.8*	*23.0*
	-7.5	*2.3*	*5.7*	*12.6*	*3.4*	*5.7*	*5.7*	*9.2*	*11.5*	*12.6*	*9.6*	*9.6*	*21.3*	*2.1*	*6.4*	*16.0*	*6.4*	*9.6*	*24.5*	*40.2*
	-5	*5.7*	*11.5*	*16.1*	*5.7*	*10.3*	*13.8*	*12.6*	*16.1*	*18.4*	*11.7*	*11.7*	*25.5*	*2.1*	*10.6*	*28.7*	*13.8*	*21.3*	*33.0*	*63.2*
abnormal return 3 months	-20	*1.1*	*3.4*	*4.6*		*3.4*	*3.4*		*2.3*	*4.6*	*7.4*	*7.4*	*10.6*	*2.1*	*3.2*	*4.3*	*5.3*	*5.3*	*10.6*	*14.9*
	-15	*2.3*	*5.7*	*8.0*	*1.1*	*4.6*	*4.6*		*2.3*	*4.6*	*7.4*	*7.4*	*14.9*	*2.1*	*5.3*	*7.4*	*8.5*	*11.7*	*16.0*	*25.3*
	-10	*6.9*	*12.6*	*17.2*	*9.2*	*14.9*	*14.9*	*5.7*	*8.0*	*11.5*	*8.5*	*9.6*	*24.5*	*2.1*	*8.5*	*17.0*	*10.6*	*19.1*	*28.7*	*50.6*
equity/total assets	2																			*0.0*
	3																			*0.0*
	4	*2.6*	*3.9*	*5.7*	*1.7*	*3.1*	*3.9*	*1.3*	*1.3*	*2.6*	*0.8*	*0.8*	*0.8*	*0.8*	*3.8*	*4.6*	*1.3*	*2.5*	*3.3*	*5.7*
return on equity	-22.5	*0.4*	*0.4*	*0.4*		*0.4*	*0.4*			*0.4*					*0.4*	*0.4*	*0.4*	*0.4*	*0.4*	*0.4*
	-12.5	*0.4*	*0.4*	*0.4*		*0.4*	*0.4*			*0.4*					*0.4*	*0.4*	*0.4*	*0.4*	*0.4*	*0.4*
	-7	*0.4*	*0.4*	*0.4*		*0.4*	*0.4*			*0.4*					*0.4*	*0.4*	*0.4*	*0.4*	*0.4*	*0.4*
tier 1 ratio	4	*1.0*	*1.0*	*1.5*	*0.5*	*1.0*	*1.0*	*0.5*	*1.0*	*1.0*			*0.9*			*0.5*	*0.5*	*0.9*	*1.4*	*1.5*
	5	*1.5*	*2.4*	*2.9*	*1.0*	*1.5*	*2.4*	*1.0*	*1.5*	*1.5*	*0.5*	*0.5*	*1.4*	*0.5*	*0.9*	*1.9*	*0.5*	*0.9*	*1.4*	*2.9*
	6	*2.0*	*5.4*	*5.9*	*2.0*	*2.9*	*5.4*	*1.0*	*1.5*	*2.0*	*0.5*	*0.5*	*1.4*	*0.5*	*1.9*	*4.6*	*0.9*	*1.4*	*2.8*	*5.9*
total capital ratio	8	*2.0*	*2.9*	*3.4*	*1.5*	*2.4*	*2.9*	*1.0*	*1.5*	*2.0*	*0.5*	*0.5*	*1.4*	*0.5*	*1.4*	*2.3*	*0.9*	*1.4*	*2.3*	*3.4*
	9	*2.0*	*3.9*	*5.4*	*2.0*	*2.9*	*3.9*	*1.0*	*2.0*	*2.4*	*0.5*	*0.5*	*1.9*	*0.5*	*2.3*	*4.2*	*0.9*	*2.8*	*3.7*	*5.4*
	10	*8.8*	*13.7*	*16.6*	*5.9*	*10.7*	*15.1*	*3.9*	*6.8*	*9.3*	*1.9*	*1.9*	*6.5*	*1.4*	*7.4*	*15.7*	*6.5*	*11.6*	*14.4*	*19.5*
Unconditional probab.		*43.8*	*68.8*	*87.5*	*37.5*	*56.3*	*75.0*	*25.0*	*37.5*	*43.8*	*10.8*	*10.8*	*35.8*	*6.3*	*25.0*	*67.1*	*35.8*	*54.6*	*73.3*	

Table 5 – Panel D

Historical joint probability of different triggers combinations
Country = France; Frequency = monthly (with no duplications)

		Macro trigger																	
		bank index return 2 weeks			bank index return 1 month			bank index return 3 months			gdp deviation from hp trend			normalised real interbank rate			normalised 10Y-3M sov. spread			Unconditional probability
Micro trigger	value:	-4.9	-3.7	-2.5	-10	-7.5	-5	-20	-15	-10	-1.5	-1	0	1.25	1	0.75	1.5	1.2	0.9	
abnormal return 2 weeks	-6	5.5	6.8	8.2	5.5	5.5	12.3	8.2	9.6	15.1	5.5	11.0	15.1	8.2	12.3	23.3	11.0	15.1	21.9	39.7
	-4	11.0	15.1	17.8	9.6	9.6	19.2	11.0	12.3	19.2	6.8	15.1	23.3	11.0	17.8	35.6	15.1	24.7	37.0	58.9
	-2	23.3	30.1	38.4	15.1	19.2	37.0	13.7	15.1	28.8	11.0	26.0	39.7	13.7	30.1	64.4	30.1	47.9	64.4	91.8
abnormal return 1 month	-10	8.0	9.3	9.3	8.0	9.3	12.0	8.0	8.0	10.7	4.7	9.4	11.8	4.7	8.2	17.6	8.2	11.8	17.6	33.3
	-7.5	10.7	12.0	14.7	8.0	9.3	12.0	9.3	9.3	13.3	8.2	16.5	18.8	5.9	10.6	23.5	10.6	18.8	27.1	48.0
	-5	13.3	17.3	20.0	10.7	13.3	17.3	10.7	13.3	20.0	11.8	21.2	28.2	7.1	15.3	36.5	15.3	25.9	42.4	70.7
abnormal return 3 months	-20	5.3	6.7	6.7	1.3	2.7	5.3	1.3	1.3	2.7	2.4	5.9	7.1	3.5	4.7	10.6	5.9	9.4	14.1	24.0
	-15	12.0	13.3	14.7	4.0	6.7	8.0	1.3	2.7	5.3	3.5	9.4	10.6	3.5	7.1	15.3	8.2	11.8	18.8	30.7
	-10	17.3	21.3	25.3	8.0	12.0	16.0	2.7	5.3	9.3	5.9	14.1	18.8	3.5	9.4	22.4	12.9	20.0	30.6	48.0
equity/total assets	2	5.7	6.2	7.5	3.5	4.4	5.7	2.6	3.1	4.8	1.7	1.7	3.8	2.9	3.3	5.8	2.9	2.9	6.3	7.9
	3	29.5	31.7	36.6	17.6	22.5	27.8	8.4	15.0	23.8	6.3	12.1	18.3	10.8	17.5	28.8	17.9	19.6	32.1	37.0
	4	59.5	64.8	74.4	37.0	45.8	55.1	16.3	29.5	48.5	10.8	23.8	37.9	18.8	31.7	56.3	37.5	42.1	66.7	75.3
return on equity	-22.5	1.3	1.3	1.3	0.4	0.9	1.3	0.4	0.9	1.3	0.4	0.4	0.8	0.8	0.8	1.3	0.8	0.8	1.3	1.3
	-12.5	3.1	3.1	3.1	1.8	2.7	3.1	1.8	2.7	3.1	1.7	2.1	2.5	2.1	2.5	2.9	1.3	1.3	2.9	3.1
	-7	4.0	4.0	4.0	2.7	3.6	4.0	2.7	3.6	4.0	2.1	2.5	2.9	2.5	2.9	3.8	1.3	1.3	3.8	4.0
tier 1 ratio	4	2.4	2.4	2.4	1.2	1.8	2.4	0.6	1.2	1.8			0.6	0.6	0.6	2.2	1.7	1.7	2.2	2.4
	5	6.0	6.0	6.0	3.0	4.8	6.0	0.6	2.4	3.6		0.6	1.7	1.1	1.7	5.6	5.0	5.0	5.6	6.0
	6	18.7	18.7	18.7	9.0	15.7	18.7	2.4	9.6	12.7		3.9	6.1	3.4	7.3	17.3	15.1	15.1	17.3	18.7
total capital ratio	8	2.4	2.4	2.4	1.2	1.8	2.4	0.6	1.2	1.8			0.5	0.5	0.5	2.2	1.6	1.6	2.2	2.4
	9	11.2	11.2	12.4	4.1	7.1	11.2	1.8	5.9	8.9	0.5	2.2	4.4	4.4	6.0	11.0	8.2	8.8	10.4	12.4
	10	32.5	33.1	36.1	17.2	24.9	32.5	7.7	17.8	25.4	3.8	11.5	15.9	11.5	18.7	31.9	20.3	22.5	30.8	36.1
Unconditional probab.		81.3	86.7	99.2	50.0	62.5	75.0	25.0	43.8	68.8	14.6	33.3	51.3	25.0	43.8	75.0	52.1	58.3	88.8	

Table 5 – Panel E

Historical joint probability of different triggers combinations
Country = UK; Frequency = monthly (with no duplications)

		Macro trigger																	
		bank index return 2 weeks			bank index return 1 month			bank index return 3 months			gdp deviation from hp trend			normalised real interbank rate			normalised 10Y-3M sov. spread			Unconditional probability
Micro trigger	value:	-4.9	-3.7	-2.5	-10	-7.5	-5	-20	-15	-10	-1.5	-1	0	1.25	1	0.75	1.5	1.2	0.9	
abnormal return 2 weeks	-6	*8.4*	*10.3*	*16.8*	*13.1*	*18.7*	*21.5*	*8.4*	*16.8*	*20.6*	*7.5*	*7.5*	*15.9*	*0.9*	*25.2*	*37.4*	*8.4*	*12.1*	*19.6*	*49.5*
	-4	*15.0*	*20.6*	*31.8*	*20.6*	*26.2*	*31.8*	*14.0*	*26.2*	*31.8*	*9.3*	*9.3*	*26.2*	*3.7*	*43.0*	*60.7*	*15.0*	*19.6*	*27.1*	*76.6*
	-2	*26.2*	*33.6*	*56.1*	*29.9*	*36.4*	*42.1*	*17.8*	*33.6*	*43.0*	*10.3*	*10.3*	*51.4*	*7.5*	*55.1*	*80.4*	*28.0*	*32.7*	*43.0*	*99.9*
abnormal return 1 month	-10	*6.3*	*8.0*	*13.4*	*9.8*	*10.7*	*10.7*	*8.0*	*12.5*	*14.3*	*8.0*	*8.0*	*12.5*	*0.9*	*17.0*	*23.2*	*9.8*	*10.7*	*13.4*	*32.1*
	-7.5	*9.8*	*11.6*	*17.0*	*14.3*	*16.1*	*17.0*	*10.7*	*17.9*	*21.4*	*8.9*	*8.9*	*21.4*	*1.8*	*26.8*	*40.2*	*10.7*	*15.2*	*20.5*	*51.8*
	-5	*12.5*	*16.1*	*28.6*	*19.6*	*22.3*	*27.7*	*11.6*	*23.2*	*28.6*	*8.9*	*8.9*	*31.3*	*4.5*	*41.1*	*62.5*	*18.8*	*24.1*	*33.9*	*81.3*
abnormal return 3 months	-20	*6.3*	*7.1*	*9.8*	*8.9*	*10.7*	*10.7*	*4.5*	*7.1*	*8.0*	*5.4*	*5.4*	*6.3*	*0.9*	*12.5*	*14.3*	*4.5*	*5.4*	*5.4*	*17.9*
	-15	*9.8*	*11.6*	*15.2*	*11.6*	*13.4*	*15.2*	*6.3*	*9.8*	*10.7*	*8.0*	*8.0*	*11.6*	*2.7*	*17.9*	*23.2*	*8.0*	*9.8*	*12.5*	*29.5*
	-10	*19.6*	*21.4*	*27.7*	*17.9*	*21.4*	*25.9*	*8.9*	*15.2*	*18.8*	*8.9*	*8.9*	*22.3*	*5.4*	*27.7*	*38.4*	*11.6*	*13.4*	*18.8*	*52.7*
equity/total assets	2	*6.4*	*7.6*	*10.6*	*5.1*	*6.8*	*7.2*	*3.8*	*4.7*	*6.4*	*3.3*	*3.3*	*10.4*	*1.3*	*6.7*	*12.9*	*4.2*	*5.4*	*5.4*	*13.6*
	3	*11.9*	*14.4*	*19.9*	*9.3*	*12.7*	*14.0*	*6.8*	*8.1*	*11.9*	*5.0*	*5.0*	*16.7*	*2.1*	*11.7*	*21.3*	*7.5*	*10.0*	*10.4*	*23.7*
	4	*25.0*	*28.8*	*40.3*	*20.8*	*28.4*	*32.2*	*11.9*	*17.4*	*26.3*	*7.5*	*7.5*	*29.6*	*6.3*	*25.0*	*37.9*	*15.4*	*19.2*	*21.3*	*45.3*
return on equity	-22.5	*3.4*	*3.8*	*4.3*	*3.4*	*3.4*	*3.4*	*3.0*	*3.4*	*3.4*	*3.8*	*3.8*	*5.0*		*2.9*	*3.8*	*4.6*	*5.0*	*5.0*	*4.3*
	-12.5	*3.8*	*4.3*	*4.7*	*3.8*	*3.8*	*3.8*	*3.4*	*3.8*	*3.8*	*3.8*	*3.8*	*5.5*		*2.9*	*3.8*	*5.0*	*5.5*	*5.5*	*4.7*
	-7	*5.1*	*5.6*	*6.0*	*4.7*	*5.1*	*5.1*	*3.8*	*4.7*	*5.1*	*3.8*	*3.8*	*6.3*		*3.4*	*4.2*	*5.9*	*6.3*	*6.3*	*6.0*
tier 1 ratio	4	*0.6*	*0.6*	*0.6*	*0.6*	*0.6*	*0.6*	*0.6*	*0.6*	*0.6*	*0.6*	*0.6*	*0.6*		*0.6*	*0.6*	*0.6*	*0.6*	*0.6*	*0.6*
	5	*0.6*	*0.6*	*0.6*	*0.6*	*0.6*	*0.6*	*0.6*	*0.6*	*0.6*	*0.6*	*0.6*	*0.6*		*0.6*	*0.6*	*0.6*	*0.6*	*0.6*	*0.6*
	6	*1.2*	*1.2*	*2.5*	*1.2*	*1.2*	*2.5*	*1.2*	*1.2*	*1.2*	*1.2*	*1.2*	*1.2*	*1.2*	*2.4*	*2.4*	*1.2*	*1.2*	*1.2*	*2.5*
total capital ratio	8																			*0.0*
	9			*0.6*	*0.6*	*0.6*	*0.6*			*0.6*			*0.6*		*0.6*	*0.6*	*0.6*	*0.6*	*0.6*	*0.6*
	10	*1.2*	*1.2*	*3.6*	*2.4*	*2.4*	*3.6*	*1.2*	*1.8*	*2.4*	*0.6*	*0.6*	*2.3*	*0.6*	*2.9*	*2.9*	*1.8*	*1.8*	*2.3*	*3.6*
Unconditional probab.		*55.8*	*62.1*	*93.3*	*55.8*	*68.3*	*80.8*	*30.8*	*43.3*	*62.1*	*12.5*	*12.5*	*56.3*	*18.8*	*62.5*	*81.3*	*37.5*	*43.8*	*50.0*	

Table 5 – Panel F

Historical joint probability of different triggers combinations
Country = US; Frequency = monthly (with no duplications)

		Macro trigger																	
		bank index return 2 weeks			bank index return 1 month			bank index return 3 months			gdp deviation from hp trend			normalised real interbank rate			normalised 10Y-3M sov. spread			Unconditional probability
Micro trigger	value:	-4.9	-3.7	-2.5	-10	-7.5	-5	-20	-15	-10	-1.5	-1	0	1.25	1	0.75	1.5	1.2	0.9	
abnormal return 2 weeks	-6	*9.9*	*11.6*	*18.8*	*8.8*	*9.9*	*16.0*	*8.3*	*12.2*	*18.2*	*13.8*	*20.4*	*23.2*	*3.9*	*21.0*	*27.1*	*18.8*	*21.0*	*23.2*	*47.0*
	-4	*18.8*	*23.2*	*34.3*	*13.8*	*16.6*	*28.2*	*11.0*	*17.1*	*28.7*	*18.8*	*23.8*	*28.7*	*7.2*	*37.0*	*45.9*	*26.5*	*27.1*	*33.7*	*70.7*
	-2	*32.0*	*40.3*	*52.5*	*19.3*	*24.9*	*42.0*	*12.2*	*18.2*	*39.2*	*21.0*	*28.2*	*40.9*	*15.5*	*56.4*	*68.0*	*33.1*	*34.3*	*54.1*	*97.2*
abnormal return 1 month	-10	*9.4*	*10.5*	*13.1*	*7.3*	*7.9*	*11.5*	*8.4*	*9.9*	*16.2*	*9.2*	*12.8*	*16.9*	*2.1*	*11.8*	*20.0*	*11.8*	*12.8*	*13.3*	*33.0*
	-7.5	*16.2*	*17.3*	*23.0*	*12.0*	*13.6*	*19.9*	*9.9*	*14.1*	*22.5*	*13.3*	*17.4*	*23.6*	*4.1*	*26.2*	*34.4*	*17.9*	*19.0*	*23.1*	*51.8*
	-5	*22.0*	*26.2*	*36.6*	*13.6*	*16.2*	*26.7*	*9.9*	*15.7*	*28.8*	*16.9*	*21.5*	*29.7*	*8.2*	*43.1*	*52.3*	*25.1*	*26.7*	*36.4*	*75.9*
abnormal return 3 months	-20	*5.8*	*6.3*	*10.5*	*5.2*	*5.8*	*7.3*	*5.2*	*6.3*	*7.9*	*6.2*	*7.7*	*8.7*	*1.0*	*6.7*	*10.3*	*6.7*	*7.2*	*7.2*	*17.3*
	-15	*8.9*	*10.5*	*15.7*	*6.8*	*8.4*	*12.6*	*6.8*	*8.9*	*12.0*	*7.7*	*9.7*	*12.8*	*2.1*	*12.3*	*17.4*	*9.7*	*10.3*	*10.8*	*26.7*
	-10	*17.8*	*22.0*	*29.3*	*9.9*	*15.2*	*24.1*	*7.9*	*10.5*	*18.3*	*12.8*	*16.9*	*21.5*	*5.6*	*26.2*	*34.4*	*18.5*	*19.0*	*24.1*	*52.4*
equity/total assets	2																			*0.0*
	3	*0.9*	*0.9*	*0.9*	*0.4*	*0.9*	*0.9*	*0.4*	*0.9*	*0.9*	*0.4*	*0.4*	*0.8*	*0.4*	*0.8*	*0.8*	*0.4*	*0.4*	*0.4*	*0.9*
	4	*1.8*	*2.6*	*2.6*	*0.9*	*2.2*	*2.6*	*0.9*	*1.8*	*1.8*	*0.4*	*0.4*	*1.7*	*1.7*	*3.3*	*3.3*	*0.8*	*0.8*	*2.1*	*4.0*
return on equity	-22.5	*0.9*	*0.9*	*0.9*	*0.9*	*0.9*	*0.9*	*0.9*	*0.9*	*0.9*	*0.9*	*0.9*	*0.9*		*0.9*	*0.9*	*0.9*	*0.9*	*0.9*	*0.9*
	-12.5	*2.3*	*2.3*	*2.3*	*1.8*	*2.3*	*2.3*	*1.8*	*2.3*	*2.3*	*1.7*	*1.7*	*2.1*	*0.4*	*2.1*	*2.1*	*1.7*	*1.7*	*1.7*	*2.3*
	-7	*2.3*	*2.3*	*2.3*	*1.8*	*2.3*	*2.3*	*1.8*	*2.3*	*2.3*	*1.7*	*1.7*	*2.1*	*0.4*	*2.1*	*2.1*	*1.7*	*1.7*	*1.7*	*2.3*
tier 1 ratio	4																			*0.0*
	5																			*0.0*
	6		*0.6*	*0.6*		*0.6*	*0.6*								*0.5*	*0.5*			*0.5*	*0.6*
total capital ratio	8																			*0.0*
	9																			*0.0*
	10		*0.6*	*0.6*											*0.5*	*0.5*				*0.6*
Unconditional probab.		*56.3*	*81.3*	*81.3*	*31.3*	*50.0*	*68.8*	*18.8*	*37.5*	*56.3*	*21.3*	*27.5*	*46.3*	*31.3*	*68.8*	*75.0*	*33.8*	*33.8*	*65.0*	

Table 5 – Panel G

Historical joint probability of different triggers combinations
Country = Japan; Frequency = monthly (with no duplication)

		Macro trigger																	
		bank index return 2 weeks			bank index return 1 month			bank index return 3 months			gdp deviation from hp trend			normalised real interbank rate			normalised 10Y-3M sov. spread			Unconditional probability
Micro trigger	value:	-4.9	-3.7	-2.5	-10	-7.5	-5	-20	-15	-10	-1.5	-1	0	1.25	1	0.75	1.5	1.2	0.9	
abnormal return 2 weeks	-6	*19.5*	*24.2*	*27.5*	*13.4*	*18.8*	*32.2*	*18.1*	*20.8*	*32.2*	*17.0*	*25.5*	*40.5*	*13.7*	*22.2*	*28.8*		*2.0*	*11.8*	*28.7*
	-4	*33.6*	*38.9*	*41.6*	*24.2*	*29.5*	*48.3*	*24.8*	*28.9*	*42.3*	*19.0*	*28.8*	*49.7*	*19.0*	*32.7*	*43.8*		*5.9*	*30.1*	*60.0*
	-2	*45.0*	*53.7*	*58.4*	*34.9*	*49.0*	*69.1*	*32.2*	*38.9*	*58.4*	*23.5*	*32.7*	*64.1*	*22.9*	*44.4*	*62.1*		*9.8*	*39.2*	*99.1*
abnormal return 1 month	-10	*19.5*	*23.5*	*27.5*	*12.8*	*16.1*	*26.2*	*14.1*	*18.1*	*31.5*	*13.1*	*19.6*	*33.3*	*13.1*	*17.6*	*21.6*		*0.7*	*8.5*	*16.0*
	-7.5	*25.5*	*30.9*	*35.6*	*16.8*	*22.1*	*34.9*	*17.4*	*22.8*	*36.2*	*17.6*	*24.2*	*41.8*	*17.6*	*24.8*	*30.1*		*2.0*	*17.0*	*31.9*
	-5	*32.9*	*40.3*	*45.6*	*25.5*	*32.9*	*49.0*	*20.8*	*26.8*	*47.0*	*22.2*	*28.1*	*52.9*	*23.5*	*37.9*	*48.4*		*5.2*	*32.7*	*63.0*
abnormal return 3 months	-20	*9.4*	*10.7*	*12.8*	*2.7*	*5.4*	*12.1*	*4.0*	*4.7*	*11.4*	*5.2*	*7.2*	*13.7*	*4.6*	*5.2*	*10.5*			*5.2*	*4.8*
	-15	*15.4*	*20.1*	*25.5*	*8.7*	*12.1*	*24.2*	*10.1*	*12.1*	*21.5*	*9.8*	*13.1*	*24.2*	*9.8*	*13.7*	*19.6*			*9.8*	*14.5*
	-10	*23.5*	*30.9*	*38.3*	*16.8*	*22.1*	*34.2*	*16.8*	*20.8*	*33.6*	*17.0*	*24.2*	*37.3*	*19.6*	*28.8*	*39.9*		*2.6*	*22.9*	*39.5*
equity/total assets	2	*1.8*	*2.2*	*2.2*	*2.2*	*2.2*	*2.2*	*1.8*	*1.8*	*2.2*	*0.9*	*0.9*	*1.8*	*0.4*	*0.9*	*1.8*		*0.4*	*0.4*	*1.3*
	3	*7.2*	*7.6*	*7.6*	*5.8*	*7.2*	*7.6*	*4.9*	*5.4*	*7.6*	*2.2*	*2.2*	*7.2*	*1.8*	*4.5*	*7.2*		*1.8*	*2.7*	*3.1*
	4	*36.3*	*43.0*	*43.0*	*30.0*	*39.5*	*50.2*	*21.1*	*24.7*	*42.2*	*10.3*	*14.3*	*37.2*	*10.3*	*29.6*	*43.5*		*19.3*	*33.6*	*5.3*
return on equity	-22.5	*8.1*	*8.5*	*8.5*	*8.1*	*8.1*	*8.5*	*7.6*	*8.1*	*8.5*	*4.5*	*5.8*	*8.1*	*1.3*	*4.5*	*8.1*		*0.4*	*0.4*	*1.3*
	-12.5	*18.4*	*18.8*	*18.8*	*14.8*	*17.9*	*19.3*	*14.3*	*15.2*	*18.8*	*8.5*	*11.2*	*18.4*	*2.7*	*12.1*	*18.8*		*3.6*	*4.5*	*2.7*
	-7	*24.2*	*25.1*	*25.1*	*19.3*	*24.2*	*25.6*	*18.4*	*19.3*	*25.1*	*9.4*	*12.6*	*24.2*	*5.8*	*17.0*	*24.7*		*5.8*	*9.0*	*2.7*
tier 1 ratio	4	*3.0*	*3.6*	*3.6*	*3.0*	*3.0*	*3.6*	*2.5*	*3.0*	*3.6*	*1.0*	*1.0*	*3.0*		*1.0*	*3.0*		*0.5*	*0.5*	*0.5*
	5	*14.2*	*19.8*	*19.8*	*13.2*	*18.8*	*23.4*	*7.6*	*8.6*	*19.8*	*4.6*	*5.1*	*17.8*	*3.6*	*13.7*	*17.8*		*14.7*	*18.3*	*5.0*
	6	*29.9*	*37.6*	*37.6*	*25.4*	*35.0*	*43.7*	*17.3*	*19.8*	*37.6*	*8.6*	*12.2*	*33.0*	*7.1*	*25.4*	*36.0*		*20.8*	*30.5*	*20.0*
total capital ratio	8	*3.6*	*4.1*	*4.1*	*3.6*	*3.6*	*5.2*	*2.6*	*3.1*	*3.6*	*1.5*	*1.5*	*4.1*	*1.0*	*2.6*	*4.6*		*1.5*	*2.1*	*3.0*
	9	*10.3*	*13.9*	*13.9*	*8.8*	*12.9*	*18.6*	*4.6*	*5.7*	*13.4*	*5.2*	*6.7*	*13.9*	*1.5*	*10.8*	*14.9*		*11.9*	*12.9*	*25.5*
	10	*24.7*	*32.5*	*32.5*	*22.2*	*30.4*	*40.7*	*13.9*	*16.0*	*32.0*	*9.3*	*11.3*	*29.4*	*8.2*	*24.2*	*33.0*		*21.1*	*29.4*	*56.0*
Unconditional probab.		*81.3*	*87.5*	*87.5*	*68.8*	*81.3*	*100.0*	*50.0*	*56.3*	*81.3*	*31.3*	*37.5*	*68.8*	*31.3*	*68.8*	*93.8*		*18.8*	*56.3*	

Table 5 – Panel H

Historical joint probability of different triggers combinations
Country = Canada; Frequency = monthly (with no duplication)

		Macro trigger																	
		bank index return 2 weeks			bank index return 1 month			bank index return 3 months			gdp deviation from hp trend			normalised real interbank rate			normalised 10Y-3M sov. spread			Unconditional probability
Micro trigger	value:	-4.9	-3.7	-2.5	-10	-7.5	-5	-20	-15	-10	-1.5	-1	0	1.25	1	0.75	1.5	1.2	0.9	
abnormal return 2 weeks	-6	1.7	3.5	3.5	2.6	3.5	4.3	1.7	4.3	4.3	6.1	8.7	12.2		12.2	19.1	5.2	7.0	13.0	28.7
	-4	5.2	10.4	10.4	3.5	5.2	9.6	6.1	9.6	13.9	11.3	13.9	26.1	1.7	23.5	40.0	7.0	15.7	27.8	60.0
	-2	14.8	21.7	25.2	7.0	10.4	22.6	8.7	13.0	20.9	16.5	20.9	47.0	4.3	40.9	68.7	23.5	35.7	58.3	99.1
abnormal return 1 month	-10	0.8	2.5	3.4	0.8	1.7	2.5	1.7	3.4	4.2	4.2	4.2	6.7	0.8	3.4	9.2	0.8	4.2	6.7	16.0
	-7.5	4.2	5.9	6.7	2.5	3.4	5.0	1.7	5.9	8.4	5.9	7.6	13.4	0.8	6.7	17.6	3.4	8.4	13.4	31.9
	-5	8.4	14.3	15.1	5.9	9.2	13.4	6.7	10.1	16.0	13.4	19.3	33.6	1.7	21.0	37.0	12.6	19.3	34.5	63.0
abnormal return 3 months	-20										1.6	1.6	1.6		1.6	2.4	2.4	2.4	2.4	4.8
	-15		0.8	2.4		0.8	0.8			2.4	2.4	2.4	4.8		8.1	9.7	4.0	4.8	5.6	14.5
	-10	4.0	8.9	11.3	1.6	2.4	4.8		0.8	4.0	6.5	9.7	15.3		16.9	27.4	9.7	12.9	16.9	39.5
equity/total assets	2	4.7	5.6	8.1	0.9	3.4	5.6	1.3	1.3	5.1	4.6	4.6	9.2	0.8	4.2	7.1	4.6	6.3	7.9	1.3
	3	6.8	8.5	11.5	1.7	4.3	8.5	2.1	2.1	6.8	5.0	5.0	10.4	0.8	6.7	10.4	5.8	7.5	9.6	3.1
	4	9.0	11.5	15.4	3.0	6.8	11.1	3.4	3.4	9.4	6.3	6.3	12.5	1.7	9.6	14.2	6.7	9.6	12.1	5.3
return on equity	-22.5	0.9	0.9	0.9	0.5	0.9	0.9	0.9	0.9	0.9	0.4	0.4	0.4		0.4	0.4			0.4	1.3
	-12.5	3.2	3.2	3.6	1.4	1.8	3.2	1.8	1.8	3.2	2.2	2.2	2.2		2.6	3.1	0.9	1.3	2.2	2.7
	-7	4.1	4.1	4.5	1.4	2.3	4.1	1.8	1.8	3.6	2.2	2.2	2.2		3.1	4.0	1.3	2.2	3.1	2.7
tier 1 ratio	4																			0.5
	5	0.7	0.7	0.7			0.7									0.7	0.7	0.7	0.7	5.0
	6	2.1	2.8	3.4	0.7	1.4	2.1	0.7	0.7	1.4			0.7	0.7	2.0	3.4	1.4	2.0	2.0	20.0
total capital ratio	8																			3.0
	9	1.3	1.3	1.9		0.6	1.3			0.6			0.6		0.6	1.9	1.3	1.9	1.9	25.5
	10	5.2	8.4	12.3		2.6	5.2			2.6			3.9	3.2	5.8	12.3	6.5	9.0	9.0	56.0
Unconditional probab.		49.6	67.9	86.3	12.1	36.7	61.7	18.3	18.3	49.2	24.6	24.6	60.4	12.1	55.0	79.6	37.1	49.6	61.3	