HISTORY OF BANKING REGULATION AS DEVELOPED BY THE BASEL COMMITTEE ON BANKING SUPERVISION IN 1974 – 2014 (BRIEF OVERVIEW)

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Abstract

In its anniversary 40 years the Basel Committee on Banking Supervision (BCBS) has published 453 documents that have framed the general bank (and particularly risk) supervision and regulation worldwide. The objective of the paper is to investigate the main stages of BCBS regulation evolution, key facts related to bank and risk regulation development process and to summarize the areas that were touched by the BCBS regulation including credit, market, operational and liquidity risks; risk and capital aggregation; corporate governance, recommendations for central banks and information disclosure by commercial banks. The paper should be viewed as a natural continuation of the Professor Goodhart's 2011 book on BCBS history with two core distinctive features. Whereas Professor Goodhart's book focuses on the early history of 1974-1997 and is based on review of BCBS internal archives, the current paper covers whole history of 1974-2014 and is based on the documents and comments publicly available on the website of the Basel Committee. Concluding remarks present recommendations to improve existing bank and risk regulation to be first adopted by the Basel Committee.

The Governor [of the meeting at the Basel Committee]
pointed out that the danger we confronted now
[on May 10, 1974] was not of lax of banking,
but of 'over-prudence'.

GOODHART
[(2011a), p. 35]

1 Introduction

The Basel Committee on Banking Supervision (BCBS) was founded in 1974. In 2014 it celebrated its 40-year anniversary. By the moment of paper preparation the committee has published 453 documents[1] with overall volume of 16 230 pages. These documents have in essence become the framework for global supervision and particularly risk regulation best practice, i. e. exactly as professor Goodhart [Goodhart (2011a), p. 542] says that '[BCBS] has become a de facto international regulatory body', though BCBS never had and never opted to have legal power to enact regulation for countries.

Often the BCBS documents originated from best practices,[2] or in fact from the member countries' experience (e. g. remember arguments for Basel I whether to have it as a risk-weighted or risk-unweighted capital ratio); sometimes they originated from industry practice (e. g. to mention first amendment to Basel I on market risk regulation and later Basel II credit risk regulation); and in particular cases requiring new solutions (e. g. regulation and capital provision against credit protection when using CDS).

When one wants to study the recent history of banking regulation and supervision, he or she has to start from detailed analysis of BCBS endowment. By now the only material that one

1 Starting October 31, 2014 the Basel Committee started denoting its papers by a 'd' symbol in front of paper name. This seems to be a new approach within Bank for International Settlements (BIS) committees, as e. g. Committee on Payments and Market Infrastructures started using similar format, see e. g. its paper 'd123' published on December 23, 2014.

2 Author is grateful to anonymous reviewer for pointing out the difference in terminology.

may find on BCBS history is the book prepared by Professor Goodhart [Goodhart (2011a)]. Though large in granularity of material reviewed due to the use of internal BCBS archives, it is limited in historical coverage dealing only with the early years of 1974-1997 before Basel II work was started.

When thinking of regulation history overview, one may wish to refer to other books – e. g. one about Federal Reserve in the US and Bank of England in the UK [Wood (2008)] or Banque d'Amsterdam [Gillard (2004)] histories – . Though idea to review those is correct, most steps of central[3] banks in recent history were a reflection of collective decisions approved by all members within the Basel Committee. Thus the objective of the paper is to research the BCBS activity leaving individual central banks out of research scope.

To provide another argument for the necessity for BCBS documents review one has to remember that the regulatory framework created by BCBS documents is grounded on 453 papers, or approximately 16 thousand pages, and more that 2 thousand comments that were sent to BCBS. These numbers seem unrealistic to be reviewed and known by each commercial or central banker. Thus a structured research of these documents is required for both central and commercial bankers to be on the same page and speak the same language knowing already discussed points and arguments.

The paper is organized in the following way. Section 2 elaborates on approach to information collection from the website of the Basel Committee. Section 3 is devoted to the review of five regulatory waves in BCBS activity. Section 4 presents key stylized facts about BCBS publications and comments sent to consultative versions of the BCBS documents. Section 5 gives a summarized review by core areas (workstreams) of banking regulation developed by the Basel Committee. Workstreams include credit, market, operational and liquidity risks; risk and capital aggregation; corporate governance, recommendations for supervisors and information disclosure by commercial banks, and other issues. Section 6 concludes by suggesting next steps for regulation improvement.

2 Approach to Basel Committee Publications Collection and Analysis

The research is grounded on the materials disclosed by the Basel Committee on Banking Supervision on the website of the Bank for International Settlements – BIS – (http://www.bis.org/publ/).[4] The two major sources of BCBS documents relate to the Basel Committee section itself and the one relating to Joint Forum that was created in 1996 to supervise financial conglomerates by initiative of the Basel Committee and the International Organization of Securities Commissions (IOSCO) as mentioned in Goodhart (2011a; p. 505). Respective materials are marked by acronyms 'bcbs' and 'joint', e. g. for results of Basel III monitoring exercise one should refer to http://www.bis.org/publ/bcbs278.htm, whereas for longevity risk discussion in the form of the final document one should go to http://www.bis.org/publ/joint31.htm. In the times when it was not possible to trace the exact day of publication (e. g. only month was mentioned for the document), day 01 of the month was registered for respective publication (e. g. for final Basel I document only month of July is mentioned on the website; see http://www.bis.org/publ/bcbsc111.htm).

3 An overview of the changing role of central banks is given by professor Goodhart [Goodhart (2011b)].

4 One of supporting motivations for the current research was the representation of number of filed documents to BCBS archives in its early years presented by professor Goodhart [Goodhart (2011a), p. 96]. Archival files are not publicly available. This is why current research was grounded on open source web-site information. As a general observation during the early years of the Basel Committee the number of internally filed documents per annum almost 10 times exceeded the number of publicly shared documents.

It is necessary to introduce Basel Committee core documents classification to be used further. All the documents mentioned above (i. e. marked as 'bcbs' and 'joint') can be broken down into four categories:

1 **Consultative document** (conventionally such document opens public discussion for respective topic);

2 **Final document** (that type of document presents the modified consultative document after review of comments received and their discussion within Basel Committee working groups);

3 **FAQ** – frequently asked questions (document of this type is used to add extra interpretation to final document if the latter occurred to be insufficient);

4 **Report** (this is usually a paper indicating the progress of work to implement and run the respective final document).

There are four other important sources of information that are found differently at web-site. Those include the following ones issued all by the Basel Committee:

5 **Newsletters;**

6 **Working papers;**

7 **Comments** received for consultative documents, and

8 **Quantitative impact studies** (QIS).

To trace newsletters one should search for acronyms of the type 'bcbs_nl', e. g. for the treatment of European Stability Mechanism and European Financial Stability Facility for credit risk measurement purpose one has to visit the following URL: http://www.bis.org/publ/bcbs_nl17.htm. As for working papers providing extended rationale for particular regulatory decisions it is required to use the acronym 'bcbs_wp', e. g. to get acquainted with reasoning for standardized approach when measuring counterparty credit risk exposure the following link http://www.bis.org/publ/bcbs_wp26.htm is of use.

It is important to limit the scope of the research by excluding the working papers published under the auspices of the Bank for International Settlements, but not directly by the Basel Committee as they predominantly deal with macroeconomic and monetary issues being not that focused on microeconomic (microprudential) regulatory issues.[5] Those (excluded from scope) are marked by acronym 'work', e. g. discussion on the sources of firms growth is available using the following link http://www.bis.org/publ/work469.htm.

Comments to consultative documents shed light on industry and sometimes regulators (from non-Basel committee member countries) position enabling to understand what

5 Nevertheless, certain papers might be of interest (e. g. that of Professor Goodhart about the role of Central Banks dated November 2010 – http://www.bis.org/publ/work326.htm – and another devoted to Basel III liquidity risk proposed regulation and dated October 2014 – http://www.bis.org/publ/work470.htm), but generally this is not the rule. This is why BIS working papers are excluded from total count of publications and pages for the purposes of this work. As another observation BIS has published close to 500 working papers from its creation, whereas Basel Committee itself has produced 453 documents in 40 years.

needs improvement in the prepared papers. It is important to note that comment origination should be considered to evaluate the degree of its bias. For example, comments from academicians may be more independent,[6] than those coming from banks or banking associations as latter may generally lobby softening or postponing the regulation if the latter brings extra burden or at least extra costs for compliance.

More recent documents have comments representation linked directly to the paper, e. g. to see comments to proposed revision of Pillar III one has to go to page http://www.bis.org/publ/bcbs286/comments.htm where 'bcbs286' refers to consultative document itself (comments publication was not that always easy and straight-forward to trace if you are not on the page of the final or consultative document itself, e. g. comments to the second consultative paper on Basel II are available here: http://www.bis.org/bcbs/cacomments.htm).

Quantitative impact studies (QIS) are run by the Basel Committee to evaluate whether proposed guidelines need further polishing, and what the overall impact on the banking system might occur subject to guidelines proxy implementation. All the QIS forms and results are stored at a separate section of the Basel Committee website, namely inhere: http://www.bis.org/bcbs/qis/.

The present section is important to understand how to search for publications of interest. As the list of Basel Committee publications is extensive, to not overload the references list the reader is recommended to refer to the above mentioned links to documents, working papers, newsletters and comments using the code explicitly stated in the text of this paper. For example, if one is interested to find the discussion on the results of trading book hypothetical portfolio exercise and one knows this is the Basel Committee paper bcbs288 published on September 9, 2014, it is needed to form the URL out of two part: the general part http://www.bis.org/publ/[...].htm and specific one where '[...]' bracket symbol has to be replaced by bcbs288 to arrive at http://www.bis.org/publ/bcbs288.htm.

Thus a total number of 453 Basel Committee publications and 2290 comments to its consultative versions were collected and reviewed (in more details those would be commented in section 4 on stylized facts; for details please, refer to Table A.1 - Table A.6).

One may wish to understand what is the contribution of Joint Forum activity to above mentioned overall number of 453 regulatory documents developed by the Basel Committee. Joint Forum has roughly produced slightly less number of documents during its lifetime since 1996, than BCBS created before 1996 (36 and 44 documents, respectively). In terms of total number of documents Joint Forum has contributed to 8% and in terms of pages to 14% (please, refer to Table A.2 for more details).[7]

Next section would discuss how those collected papers form five regulatory waves of Basel Committee work on banking regulation development.

3 Five Regulatory Waves of the Basel Committee Work on Banking Regulation

The Basel Committee on Banking Supervision originated from groupe de contact with French being the original working language as mentioned by Goodhart (2011a; p. 17). If the latter was established in 1972, the former was created in 1974. Thus in 2014 the Basel Committee celebrated its 40-year anniversary. To research the banking regulation evolution

6 Author is grateful to anonymous reviewer for pointing out the possibility of bias in comments coming from different sources (from banks lobbying their interests and academics being more independent compared to banks).

7 Author is grateful to anonymous reviewer for recommendation to decompose documents in those produced by Joint Forum and others.

produced by the Basel Committee one has to focus on subject areas (e. g. concrete risk regulation domains). Still to understand the driver even for particular risk regulation one should understand what was the regulatory wave for the world banking industry as a whole. Thus before proceeding to describing stylized facts about banking regulation and paying detailed attention to the workstreams (subject areas), it is necessary to identify core regulatory waves that existed in the history of banking regulation produced by the Basel Committee during its 40 years.

The Basel Committee 1974 – 2014 work on developing banking regulation can be broken into the five following regulatory waves (for details, please, consult Table A.2). Name for regulatory waves are proposed to reflect the dominating core document that occupied the mind of central and/or commercial bankers at the time.

1 1974 – 1986 – Concordat;

2 1987 – 1998 – Basel I;

3 1999 – 2008 – Basel II;

4 2009 – 2011 – Basel III;

5 2012 – 2014 – Post-Basel III.

3.1 1974 – 1986 – CONCORDAT (FIRST REGULATORY WAVE)

The Basel Committee work started to deal with supervisors' interaction when in need to cross-border resolve weak banks. This marked the start of the first regulatory wave driven by publication of the very first document **'Concordat'** (bcbs00a; September 01, 1975). After Concordat discussions and document preparation on other issues (including Basel I and liquidity risk regulation) started.

Though intensive internally [including the intent of the USA and the UK to solely agree on capital regulation rules disregarding the work inside the committee as described by Goodhart (2011a)], publicly the regulatory wave lasted till 1986 having only 11 documents published with a total volume of 77 pages. Economic activity was tense at the start of the period after the 1973 oil price shock and the Iran-Iraq war of 1982; there were notable bank failures including Herstatt in 1974. Nevertheless, at that time the Basel Committee never publicly launched consultative documents.

3.2 1987 – 1998 – BASEL I (SECOND REGULATORY WAVE)

The second regulatory wave started with the publication of the consultative version for **'Basel I'** (bcbs3a; December 1, 1987). Basel I has introduced the basic capital adequacy ratio as the foundation for banking risk regulation. Initially it was a ratio of bank capital to risk-weighted assets for credit risk only. Still the amendment to Basel I started to be worked out mostly after the famous document of 'Basel I' itself was published on July 01, 1988 (bcbsc111). That amendment was to incorporate market risk, as well as to adjust for deficiencies of Basel I framework (e. g. on country list to be assigned zero risk-weighting). The work to incorporate latter issues took another 10 years, mostly as long as it took Peter Cooke, at the time of Basel I Chairman of the Basel Committee, to agree on the basic Basel I paradigm. Important to note that though Basel I was a fixed risk-weighting approach for credit risk, market risk regulation already allowed for variable risk-weighting (i. e. use of internal models). To remember during the second regulatory wave the very first mention about operational risks occurred on July 01, 1989 (see bcbsc136 paper on "Risks in Computer and Telecommunication Systems"). Though

operational risk management principles were published on September 01, 1998, it did not receive quantitative treatment as was the case with credit and market risks when amending Basel I.

Active work on polishing Basel I during the second regulatory wave passed within significantly positive economic environment (to say during first regulatory wave S&P 500 grew by 200% from 83 in 1974 to 236 in 1986; whereas during the second regulatory wave it skyrocketed to 1085 in 1998, i. e. by nearly 400%). During the second regulatory wave 8 consultative documents were already published by the Basel Committee, but no feedback received was made publicly available. The stage is characterized by the publication of 57 documents in total with 1467 page-equivalent (i. e. 20 times larger volume) during second regulatory wave.

3.3 1999 – 2008 – BASEL II (THIRD REGULATORY WAVE)

The third regulatory wave started by the announcement on January 11, 1999 that the work on new capital regulation, i. e. on **'Basel II',** began. Basel II had several major differences to amended Basel I document. It tailored to introduce internal models for credit risk (internal ratings-based – IRB – approach); it added quantifiable risk charge for operational risk. Basel II also introduced pillar-framework where Pillar I stood for minimum capital requirements, Pillar II – a supervisory review of Pillar I results (Pillar II charge often exceeds Pillar I because of incorporation of extra risks, but to a lesser extent as when started banks were allowed to account for diversification benefits; 2007-09 crisis was a reason used by regulators to cancel possibility to account for diversification benefits; still Pillar II is a totally needed piece since the power of capital requirements determination shifted from regulators to banks when IRB models were authorized),[8] and Pillar III summarizing approach to information disclosure. Given the consultation process and amendments the regulatory wave lasted till the bottom of the world 2007-2009 crisis. Thus it encapsulated the need to revise market risk models, inter alia by inclusion of stressed component to simple (normal, non crisis state of economy) market risk measure.

The third regulatory wave was the most turbulent in terms of economic environment. During 1999-2008 S&P500 fluctuated in the range of 1000-1500 responding to the negative consequences of 1997 Asian crisis and 1998 Russia sovereign debt default, to 2001 dotcom bubble breach, 2007 CDO mortgage plummet. Still the Basel Committee published 155 documents, or 7168 pages, during its third regulatory wave that is 3 times more than during its second one, though regulatory waves are comparable by time length (both lasted 10 years).

Worth mentioning that it is exactly during the third regulatory wave that the Basel Committee started to publish comments that it received on consultative documents (the very first comments were published with respect to second consultative paper on Basel II, cp2, January 16, 2001). Nevertheless, publishing comments was not a regular practice. For example, out of 43 papers open for consultation by the Basel Committee during the third regulatory wave comments are available only for 9 of them.

3.4 2009 – 2011 – BASEL III (FOURTH REGULATORY WAVE)

The fourth regulatory wave is devoted to **'Basel III'** that was brought as a remedy and a response to 2007-2009 crisis. It started on December 01, 2009 when Basel III first consultative paper was published (bcbs164). Basel III brought several innovations to banking risk regulation. First, it proposed quantification for liquidity risk. Second, capital was redefined; extra capital buffers were introduced. Third, the unweighted capital ratio was introduced to

8 Author is grateful to anonymous reviewer for underlying and arguing for the importance of Pillar II.

be monitored in parallel to risk-weighted one. Fourth, unified rules for remuneration of risk-taking staff were proposed.

Being introduced at the times of economic recession the fourth regulatory wave was accompanied by the market upturn and S&P 500 growth by 33% from 948 in 2009 to 1267 in 2011. Though short in timing (3 years) during the fourth regulatory wave 83 documents were published by the Basel Committee totaling to 3414 pages, this is mostly half of document volume produced at the third stage, though it lasted 3 times less (3 years instead of 10).

During fourth regulatory wave publishing comments has become a rule for the Basel Committee. Thus comments for only 2 out of 21 consultative papers were not made public, including sound practices for back-testing counterparty credit risk models (bcbs171; April 1, 2010) and core principles for effective deposit insurance systems (bcbs182; November 1, 2011).

3.5 2012 – 2014 – POST-BASEL III (FIFTH REGULATORY WAVE)

As Basel III is mostly finalized in terms of minimum requirements and implementation deadlines (e. g. for liquidity risk regulation), recent years are marked by certain proposals that are still not associated with Basel III and are significantly novel with respect to a latter one. That is why it is argued that fifth regulatory wave has to be separated.

Formally fifth regulatory wave started from the publication of the consultative paper on revision of the approaches to trading book definition and respective market risk measurement (bcbs219; May 03, 2012). The regulatory wave is characterized by significant changes in some other areas, including the following ones: introduction of intraday liquidity management (bcbs225; July 2, 2012); revision of capital charge with respect to securitizations (bcbs236; December 18, 2012); adding capital charge for purchased credit protection, i. e. for CDS (bcbs245; March 22, 2013); revision of approaches to managing credit concentration risk (bcbs246; March 26, 2013); revision of information disclosure standards to most extent being the follow-up of Basel III innovations (bcbs286; June 24, 2014); change of approach to operational risk quantification (bcbs291; October 6, 2014).

The fifth regulatory wave also enjoyed the favourable economic environment with S&P 500 growing by another 50% from 1267 in 2011 to 1906 in 2014. The regulatory wave was comparable to the preceding one in terms of documents volume published. The Basel Committee published during 2012-2014 another 111 documents with 3852 pages of total volume.

Fifth regulatory wave can be positively differentiated from all the previous four regulatory waves as publishing comments has become a must, i. e. comments for all[9] 27 consultative papers are available on the web.

4 Stylized Facts about Banking Regulation Published by Basel Committee

If one wanted to get an insight in the current state of banking regulation and understand what drove it to the current state, the following stylized facts are of need to obtain the first quantitative representation of subject area. Below the subsections of Section 4 have the names of the observed stylized facts.

9 As of the paper preparation moment it is impossible to conclude about 7 papers as they were only open for consultation with comments receipt in 2015. Thus though total number of consultative papers during fifth regulatory wave equals to 34 with 7 being deducted from the total count for the purpose of comments calculation (comments for those are not yet available).

4.1 THE BASEL COMMITTEE HAS PUBLISHED 453 DOCUMENTS IN ITS 40 YEARS

During 1974-2014 the Basel Committee has published 453 documents, including 109 consultative papers, 197 final documents, 43 QIS documents, 49 reports, 12 responses to frequently asked questions, 26 working papers,[10] 17 newsletters. There was only one paper in the history of the Basel Committee called 'Discussion Paper' (bcbs258; July 08, 2013) devoted to "The regulatory framework: balancing risk sensitivity, simplicity and comparability". Nevertheless, as there was a consultation period launched for that paper, it was assigned to consultation paper category (for more details, please, refer to Table A.1). As one may notice, only every second paper is made available for consultation on average (number of final and consultative papers are 197 and 109, respectively).

Overall number of pages published by the Basel Committee in its 40 years exceeded 16 k. This is smaller than the number of pages per CDO-squared investor as estimated by Andrew Haldane [Haldane (2009), p. 21] where it equaled to 1.1 bn pages per CDO-squared investor. Nevertheless, even 16 k pages are mostly impossible to be read by an average target user (commercial banker or regulator). **This implies regulation misinterpretation, its complexity, inconsistency and gaps that would be pointed out in more detail below.**

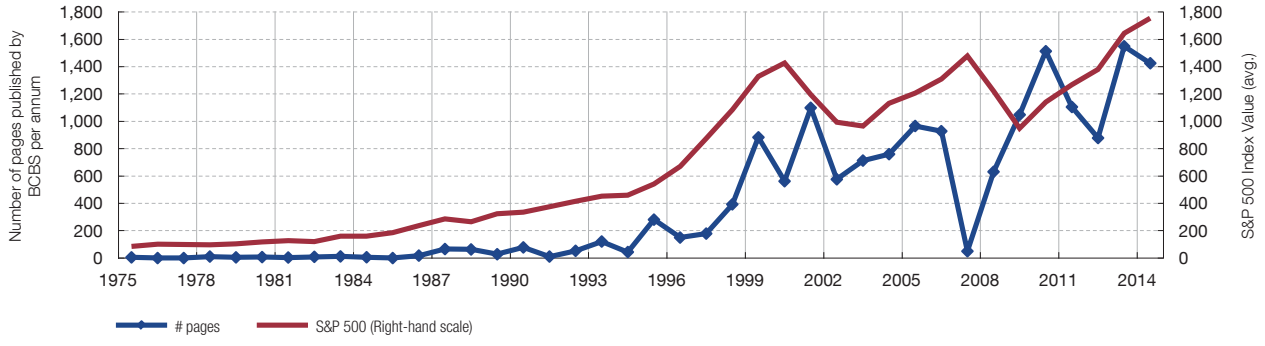
When reviewing the above mentioned regulatory waves of the banking regulation produced by the Basel Committee, one would observe that the publication volume in pages follows the trend of economic activity from the very general perspective. One may look at Chart 1 to observe the mentioned codependence of number of pages published by the Basel Committee and S&P 500 value.

If one takes a look at the scatterplot at Chart 2 comparing the number of pages published by the Basel Committee per annum and the annual change in S&P 500 one year later, one may even argue for the positive dependence, though not statistically significant given low number of annual observations (R-squared presented on a chart is a correlation coefficient for two variables; R-squared for yearly data equals 9%). If one takes a look at quarterly data, the situation is mostly unchanged with R-squared decreasing to 3%, being statistically insignificant.

The observed from Chart 1 and Chart 2 (spurious) co-dependence might lead to a mistaken take-away that Basel Committee regulation may cause economic crisis. The logic would be the following. After the important document is published (e. g. Basel I, Basel II, Basel III), there

10 Formally the Basel Committee by end 2014 has published 27 working papers. Nevertheless, working paper No. 11 on the Treatment of Asset Securitisations was classified as a consultative (not working) paper as the deadline for comments was set as Dec. 20, 2002 and 22 comments were obtained.

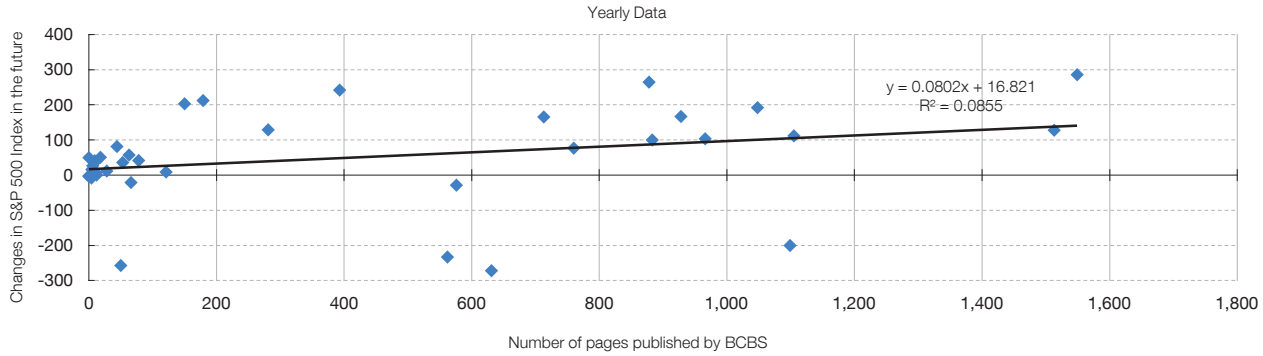
BASEL COMMITTE PUBLICATIONS VS. THE INDICATOR OF ECONOMIC ACTIVITY (S&P 500) CHART 1



SOURCES: Yahoo.finance, BIS and author's elaboration.

SCATTERPLOT OF BASEL COMMITTEE PUBLICATIONS IN PAGES P. A. VERSUS THE CHANGE IN ECONOMIC ACTIVITY

CHART 2



SOURCES: Yahoo.finance, BIS and author's elaboration.

is a slowdown in regulation activity and economic agents might take extra risks that accompanied with low volume of new regulation published would end in losses and in low S&P 500 value. Alternative rationale can be found at Goodhart (2011a) when he explained that opponents to Basel I tried to justify that 1992 crisis in the US was driven by Basel I as it was exactly the implementation time frame of several years post-1988 that over-constrained the lending through a new risk-weighted capital ratio. Similar artificial logic may be applicable to Basel II as 2007 crisis started after final (comprehensive) version of Basel II was published on June 30, 2006 (bcbs128).

Nevertheless, one has to consider three arguments supporting the evidence that Basel Committee banking regulation cannot imply crisis.

First, as it was mentioned above, the dependence measure is not statistically significant. If one wants to run a more robust statistical procedure (e. g. Granger causality test), the finding would be that banking regulation follows the economic activity. This is a natural conclusion as regulation innovations are conventionally agreed and adopted after particular crisis or bank default had shed light on certain deficiencies.

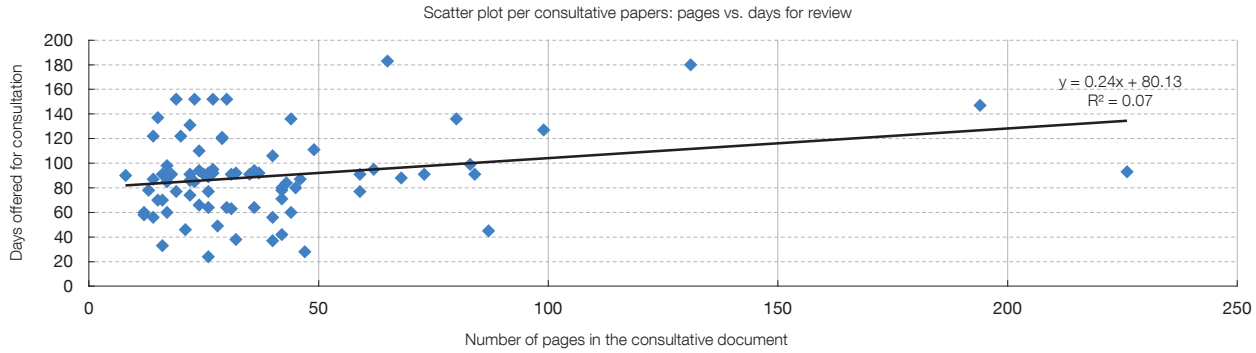
Second, as for Basel I Professor Goodhart [Goodhart (2011a), p. 192] argues that it was difficult when observing the decrease in lending to separate supply-side effects (driven by new risk and capital regulation) from demand-side ones.[11] Thus direct causality of Basel I and forthcoming crisis is not justified.

Third, as for Basel II it is incorrect to blame it for leading to 2007-2009 crisis as US banks (to be associated with the source of crisis) did not adopt Basel II, though recommended, but not insisted by the Federal Reserve; and the Basel II itself had transitional arrangements for next three years establishing capital floors of 80-90% of Basel I level

11 *"… was Basel I responsible for the credit crunch of 1991/92?*
There was no explicit discussion in the BCBS about the question whether there might be macro-economic consequential of the introduction of the Accord; at least none that I have found, beyond the (implicit) assumption that bank holding of more capital (and especially so against riskier assets) would provide greater protection against both individual and systemic failure, and thereby stabilize and improve macro-economic fundamentals. A reconsideration of this comfortable view was called for by the course of the recession of 1991/92, especially the recession in the United States… This occurred just at the end of the transition period, when all banks had to ensure that their capital rose to, and above, the Accord [Basel I Capital Accord of 1988] requirements… If they [US banks] could not increase the capital (numerator), the only way to enhance their capital ratios would be to cut back on lending (the denominator). Thus some believed, and presented evidence, that there had been a Basel-induced 'credit crunch' in the USA in 1991/92, thereby deepening the recession. The problem was that the recession itself lowered the demand for borrowing, and it was extremely difficult to identify, and separate, demand effects from additional supply effects (if any)." [Goodhart (2011a), pp. 191-192].

DEPENDENCE BASEL COMMITTEE CONSULTATIVE DOCUMENTS AND RESPECTIVE CONSULTATION PERIOD

CHART 3



SOURCES: BIS and author's elaboration.

that did not permit European banks to quickly take on much more risks after Basel II publication in 2006.

4.2 AVERAGE CONSULTATION PERIOD OFFERED BY THE BASEL COMMITTEE EQUALS TO 3 MONTHS

As mentioned above, the Basel Committee has offered 109 papers for public consultation during 1974-2014. When publishing a paper a consultation period is set by the Basel Committee. It is set regularly from the third regulatory wave of Basel II. Before there is only one paper for which it was possible to trace the length of consultation period. This was a paper about supervision of financial conglomerates (bcbs34; February 1, 1998) of 131 pages large with consultation ending on July 31, 1998.

As for the rest regular consultation processes one may try to review whether there is any dependence of paper size in pages and the length of consultation period. For this reason one should look at Chart 3. It shows that there is no statistically significant dependence between the volume in pages of consultative document offered by the Basel Committee and the consultation period.

On average the consultation period is 3 months, or 90.3 days, with minimum being 24 days [paper devoted to capitalization of bank exposures to central counterparties (bcbs206; November 1, 2011) with still 28 comments being obtained] and maximum 183 days [paper named "Credit Risk Modelling: Current Practices and Applications" (bcbs49; April 1, 1999) when the comments were not disclosed].

4.3 THE TOTAL NUMBER OF COMMENTS RECEIVED AND PUBLISHED BY THE BASEL COMMITTEE EQUALS 2290

During its 40 years the Basel Committee has received and made publicly available 2290 comments on its 109 consultative papers. Though in fact those comments came only in recent 13 years as the very first comments were published with respect to second consultative version of Basel II (cp2; January 16, 2001).

Comments by itself range widely from a sentence sent from iPhone (e. g. see Prasad Saurav comment to paper on internal audit, bcbs210; December 2, 2011) to a 150 pages report (e. g. see Association of German Savings Banks consolidated comments to second consultative paper on Basel II, cp2; January 16, 2001).

On average 22 comments are sent per consultative document with minimum of 4 comments being sent to the document on revised good practices for supervisory colleges (bcbs276; January 23, 2014) and maximum of 272 comments on Basel III papers on strengthening resilience of banking sector and on international framework for liquidity risk measurement, standards and monitoring (bcbs164, bcbs165; December 1, 2009).

Not all the comments are available in the original form. For four papers the Basel Committee decided to present the consolidated overview of comments, just mentioning how many comments were received. This is the case for the following papers:

— Supervisory guidance on the use of the fair value option by banks under International Financial Reporting Standards (bcbs114; July 13, 2005), 20 comments;

— Home-host information sharing for effective Basel II implementation (bcbs120; November 22, 2005), 11 comments;

— Sound credit risk assessment and valuation for loans (bcbs121; November 28, 2005), 15 comments;

— Core Principles for Effective Banking Supervision (bcbs123; April 6, 2006), 31 comments;

Not every comment sent and published is personalized. For example, there are three papers that received four anonymous comments:

— Mortgage insurance: market structure, underwriting cycle and policy implications – consultative document (joint30; February 11, 2013), 1 anonymous comment;

— Strengthening the resilience of the banking sector, Basel III (bcbs165; December 1, 2009), 2 anonymous comments;

— The internal audit function in banks (bcbs210; December 2, 2011), 1 anonymous comment;

4.4 THE TOTAL NUMBER OF UNIQUE PEOPLE (INSTITUTIONS) WHO HAVE SENT THEIR COMMENTS TO THE BASEL COMMITTEE IS 853

The total number of unique identifiable commenters who have sent 2209 comments to the Basel Committee equals to 853. On average one person (institution) has sent historically comments to three consultative papers. If one takes a look at TOP-50 commenters, than one may conclude that TOP-50 commenters form only 6% of total number of commenters, but they have sent 849 comments, i. e. 37% of total number of comments (for details of TOP-50 commenters, please, refer to Table A.3).

The most active are the four commenters who have sent more[12] than 30 comments, i. e. they commented ca. every third paper. Those are banking associations from France (41 comments), Canada (41 comments), Japan (40 comments), and Hong Kong (33 comments).

4.5 THE OVERALL PROPORTION OF PRIVATE SECTORS COMMENTERS EQUALS TO 12% OF TOTAL HAVING SENT 7% OF ALL COMMENTS[13]

All the commenters can be assigned a type depending on their professional occupation or affiliation. There are commercial banks, banking associations, other associations and federations, professional advisors (audit, consulting, rating companies), some narrow focused entities (payment systems, securitization, insurance), authorities and manufacturing.

12 The threshold was chosen subjectively where the difference between the number of comments sent is the largest, i. e. in between 4th and 5th commenters the difference is 5 comments, whereas between 5th and 6th only one comment.

13 Author is grateful to the anonymous reviewer for proposing this interesting decomposition to compare lobbying interests.

Would like to particularly explain the existence two cohorts: authorities and manufacturing. Authorities include central banks, ministries, other state bodies and World Bank and International Monetary Fund as the latter two are financed by state governments.

Manufacturing includes companies that are either directly or closely involved in production of cars (e. g. Daimler), planes (e. g. Lufthansa, Aviation working group), ships (e. g. Danish Ship Finance), oil (e. g. Shell), other equipment (e. g. Siemens). To summarize the arguments of manufacturing cohort were principally of two sorts: companies of interest either wanted certain items to be recognized as collateral (e. g. planes), or opted for facilitation (i. e. lower capital charge) for leasing activities (e. g. for cars, long-term projects). Those comments were considered when specialized lending category was developed as a very differentiated type of lending that inter alia included project finance (for long-term investments like oil plant etc.) and object finance (for leasing of cars, ships, planes).

Table A.5 shows that commenters and comments mostly had banking background coming either from banks or banking associations. Thus those resulted in 46% of total comments, same time being only 25.6% of total number of commenters. Comments from academics (that are expected to be more unbiased) and other individuals (sometimes people did not explicitly put their affiliation when commenting) contributed only to 7% of total comments being 12.2% of total number of commenters.

4.6 REPRESENTATIVES OF 83 COUNTRIES HAVE SENT THEIR COMMENTS TO THE BASEL COMMITTEE

For the purpose of research each commenter was assigned a country of residence either based on the location of headquarters[14] or the country code of the contact phone number. As a result 2209 comments came from 853 unique commenters originating from 83 countries of the world (please, refer to Map 1).

Those 83 countries represent 32% of total number of countries in the world, but constitute 94% of the world GDP. Though one may wish to conclude that most of economically active world is aware of the changes in banking regulation and actively participates in shaping it through sending its comments. However, this is not the fact as the top-countries (whose people or institutions have sent more than 100 comments) are the United States (516 comments), the United Kingdom (317 comments), Germany (182 comments), Belgium (152 comments), Japan (104 comments), and France (102 comments). Those six countries contribute to only 42% of the world GDP having sent 63% of total comments. As one may notice those were the countries originally being members of the Basel Committee since its establishment in 1974.

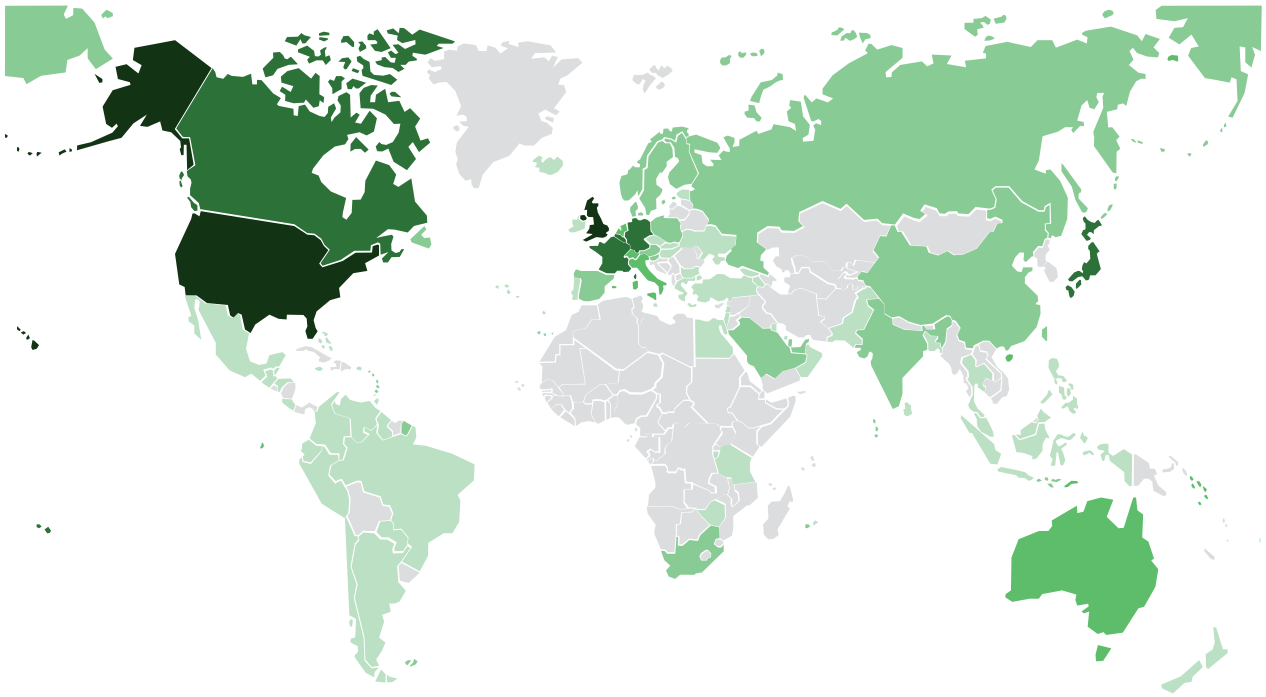
If one wishes to test hypothesis whether it is the scale of economic activity or the level of economic development that drives the frequency[15] of comments sent, then Chart 4 and

14 For complicated cases the residence of the most easily identifiable commenter (if several) was used, e. g. there were comments to second (cp2; January 16, 2001) and third (cp3; April 29, 2003) consultative papers on Basel II from the Aviation working group. Aviation working group comment was signed by heads of Airbus and Boeing. As Airbus production is located in several European countries, the residence of the joint comment was assigned to the United States because of uniqueness of Boeing residence. As one may see the numbers in Table A.4 in Annex, several complicated cases cannot change significantly the overall comments' breakdown by countries.

15 One may justly argue that the number of comments as well as the number of pages in the comment and/or in the document are peripheral to the quality of those comments and documents. Though the argument is correct, there is no proxy to measure the correctness and/or the quality of the comments and the documents. The fact that particular comment was not incorporated in the document does not mean it is useless. The comment might be wrongly or unclear presented, it was not the time to understand and share the comment. Opposite is also true. If the comment was incorporated, it does not mean it was definitely correct. It means that regulators and commenter had the same vision and were able to understand each other, and moreover agree at a distance with each other. That is why the number of comments and pages is a second best proxy to measure at high-level the domain of banking regulation. Analysis of documents content (given limitations of the paper) would be given in Section 5.

ILLUSTRATIVE MAP OF COUNTRIES ACTIVITY IN TERMS OF COMMENTS SENT TO BASEL COMMITTEE

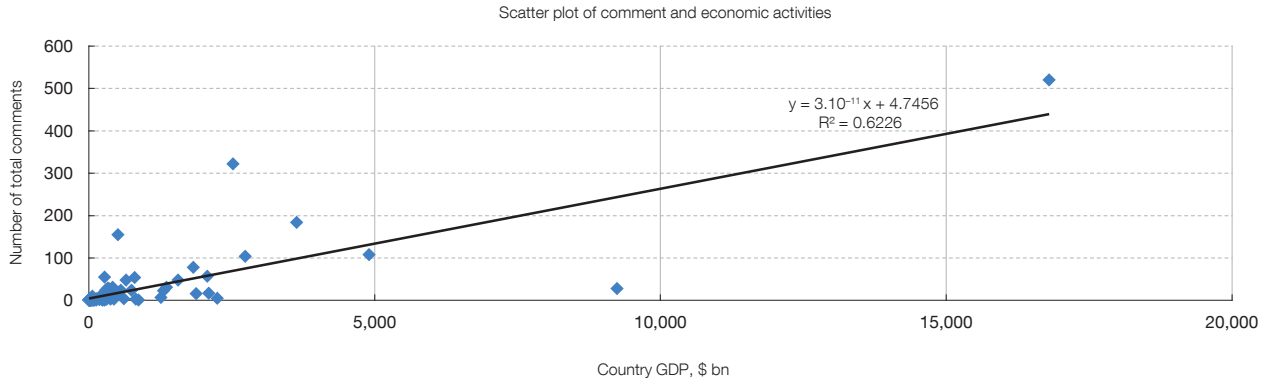
MAP 1



SOURCES: BIS and author's elaboration.
NOTE: The map is the representation of data available in Table A.6. The darker the green colour is, the more comments were sent from that country. Grey colour corresponds to the absence of comments originating from the region.

DEPENDENCE OF COMMENTS SENT BY COUNTRIES VERSUS THE COUNTRY GDP AS A BENCHMARK FOR SCALE OF THE ECONOMY

CHART 4



SOURCES: World Bank, BIS and author's elaboration.

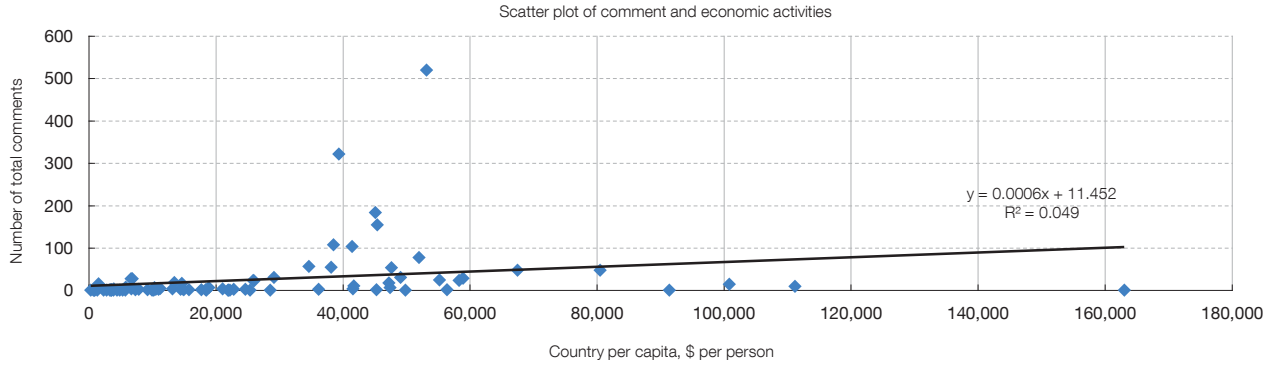
* One may point out that there is a methodological inconsistency as the comments were received by the Basel Committee (and published) since 2001 and the GDP (and GDP per capita) data is taken as of end-2013. From one side, the argument is theoretically correct. From another side, there are several counterarguments to defend the methodology used. First, GDP values per country do strongly correlate from year to year. Thus using end values from time series is justified. Second, it might be a research extension to observe the commenting activity with respect to change in country GDP year on year, but this falls out of the scope of the current research.

Chart 5 should be analyzed. Mentioned charts map number of comments against GDP and GDP per capita as latter are conventional proxies for the level of economic development. Limitation[16] of such approach is that Basel Committee tailors its regulation for internationally active banks and not for national economies as a whole. As a research extension one may wish to correlate comments to number of internationally active banks in a region. In addition to the absence of a formalized list of internationally active banks per country, one should be

16 Author thanks anonymous reviewer for drawing attention to the limitations of bank research when using GDP.

DEPENDENCE OF COMMENTS SENT BY COUNTRIES VERSUS THE COUNTRY GDP PER CAPITAL AS A PROXY FOR LEVEL OF ECONOMIC DEVELOPMENT

CHART 5



SOURCES: World Bank, BIS and author's elaboration.

careful in defining such institutions (e. g. one has to answer whether a bank operating in a neighboring country should be considered as an internationally active one or not). Linkage to the number of internationally active banks falls out of scope of current research.

As one can see from Chart 4, there are two outliers: the United States producing the world largest GDP of USD 17 trln and being the origin of the world largest number of comments (516) sent and published by the Basel Committee; and China with GDP equaling USD 9 trln and being the origin for much lesser number of comments (28). Though limited in observations (83 countries are considered), one may assume to have positive dependence of the country scale of economic activity (the amount of total GDP) and the number of comments sent to the Basel Committee (one may see a measure of correlation – R-squared – equals to 62% on Chart 4).

Chart 5 allows one to map GDP per capital as the measure of the level of economic activity and the number of comments sent and published by the Basel Committee. As one may see from Chart 5, there is no statistically significant dependence between the level of economic activity and the number of comments that were sent from particular country (R-squared is only 5%). Worth explaining are the outliers observed. If largest in terms of total number of comments are the United States and the United Kingdom, the country with the largest GDP per capita (one out of those having sent comments) is Monaco with GDP per capital equaling to USD 163 k per capita and only one comment sent historically [it was a comment from Experian-Scorex on the third consultative paper of Basel II (cp3; April 29, 2003)].

5 Overview of Banking Regulation by Workstreams

Having provided the description of five regulatory waves of the Basel Committee activity on the banking regulation development process during 1974 – 2014 and having given its brief quantitative overview, current section focuses on banking regulation evolution per workstreams.

When researching the publications of the Basel Committee published during 1974 – 2014, the following workstreams are proposed to be identified.[17]

1 Credit Risk Regulation;

2 Market Risk Regulation;

17 Most of them coincide with the working groups and task forces existing in the Basel Committee, but as the latter are not publicly available classification proposed by the author is used.

3 Operational Risk Regulation;

4 Liquidity Risk Regulation;

5 Risk Aggregation and Capital Definition;

6 Corporate Governance Issues;

7 Recommendations for Supervisors;

8 Information Disclosure Issues;

9 Other Issues.

The subsections below are organized as follows. First, key facts about publications of the respective workstream are presented (for details, please, see Table A.1). Second, the workstream composition by topics is given. Third, key evolutionary stages that are remarkable for the workstream from the perspective of the five regulatory waves mentioned are discussed (for linkage of publications by workstreams and regulatory waves, please, refer to Table A.2).

5.1 CREDIT RISK REGULATION

Credit risk regulation incorporates the largest number of publications (94) totaling to 2855 pages. Credit risk was more actively developed during third and fifth regulatory waves of Basel II and post-Basel III. The workstream has the largest number of relevant newsletters published (9 out of 17). The total number of publications includes 23 consultative, 41 final, 11 working papers and others. To underline the importance[18] of the domain would mention that it constitutes 21% of total number of documents and 18% of total pages published by the Basel Committee.

The credit risk regulation workstream refers to banking book assets and covers such issues as concentration risk regulation, securitization treatment, credit risk transfer, accounting issues, measurement of counterparty credit risk, risk measurement for centrally and non-centrally cleared derivatives, internal ratings based (IRB) models validation, capital charge for equity exposures in the banking book, recommendation for IRB risk components measurement (exposure at default, EAD; loss given default, LGD), treatment of credit risk mitigation (CRM) techniques, alignment of expected loss measures and provisions, particular cases of risk-weighting.

Basic credit risk regulation was first introduced when developing Basel I. Four classes of assets were suggested with predefined risk-weights: sovereigns (0%), interbank lending (20%), mortgage (50%), and others (100%). First shift to internal models was done after Basel I was already in place, when the paper on credit risk modeling (bcbs49) was published in April 1999. After that the idea of internal ratings-based (IRB) approach was dominating the regulatory environment. The IRB approach include five risk components: probability of default (PD), loss given default (LGD), exposure of default (EAD), maturity (M), sales volume to distinguish small and medium-sized enterprises (SMEs) (S). The risk components use is described in the explanatory note (irbriskweight; July 01, 2005). It is important to recall that the IRB approach is based on the theoretical model of a mixture of normal distributions

18 The author acknowledges recommendation of the anonymous reviewer to explicitly evidence the importance of the area by presenting share of contribution to total number of documents and pages.

first introduced in Vasicek (1987), i. e. **12 years** later after theoretical finding. The confidence level for IRB models used is 99.9%.

The IRB approach is based on a single risk-factor model assuming that (a) there is one systemic risk factor; (b) risk components (e. g. PD and LGD) are independent; (c) loan portfolio is infinitely granular. As was shown later none of the assumptions does hold, e. g. Gordy and Lütkebohmert[19] [Gordy, Lütkebohmert (2013)] show portfolio finite granularity needs adjustment to capital charge; Folpmers (2012) has the evidence of positive PD-LGD correlation; adjustment to multi-risk factor is shown in Pukhtin (2004).

Nevertheless, it is proposed to use the regulatory IRB formula with above limitations kept in mind. The formula itself may be decomposed in input parameters (PD, LGD, EAD, M, S) and correlation (R) functions. Parameter S enables to adjust correlation function and to decrease capital charge when lending to SMEs.

Basel III (bcbs164; December 01, 2009) prescribes introducing adjustment for systemically important financial institutions (SIFIs) by using 1.25 multiplier in front of correlation function implying capital overcharge when lending to SIFIs. It is important to explain the meaning of the multiplier. It has to be used by banks that lend to SIFIs, not necessarily being SIFIs themselves. SIFIs are separately required to have higher capital (for details see section 5.7). The essence of the rule (multiplier of 1.25) is that those who lend to SIFIs should have higher capital all else being equal, whereas the idea of the extra capital buffer for SIFIs is that SIFIs themselves should have higher capital. **From a balanced (closed) economic system perspective one might doubt on the necessity of both requirements same time as either the lender increases its capital assuming (taking) higher risks of SIFIs, or SIFIs hold higher capital and have lower own default probability implying no need for its creditors to overprovision capital, when lending to SIFIs.**

IRB parameters are advised to be estimated along the whole economic cycle according to Basel II. Nevertheless, the cycle definition is never introduced. There is a floor requiring having the data window no less than 5 years for PDs, and 7 years for LGDs. However, when reviewing Basel III pack (bcbs164; December 01, 2009), one may find a proposal to introduce countercyclical capital buffer based on credit-to-GDP ratio.[20] **Thus for consistency it is proposed to use the same proxy for economic cycle as in Basel III for the purpose of Basel II IRB model development.**

There is an important paper relating to IRB parameters, namely on the use of the parameters, i. e. on Use Test (bcbs_nl9; January 9, 2006). It states that the risk components should be the foundation of all decisions of the credit institutions, particularly, IRB components must be used in pricing, provisioning, strategic planning and budgeting.

There are three papers that deal with validation of IRB parameters: studies on validation (bcbs_wp14; May 01, 2004); update on validation (bcbs_nl4; January 01, 2005); validation of low-default portfolios (LDP)[21] (bcbs_nl6; January 9, 2005). It is recommended that quantitative and qualitative criteria should be used to assess the risk component model performance.

19 For information Lütkebohmert provided comments to Basel III paper (bcbs165; December 1, 2009) together with Ebert.

20 The proposed ratio is suboptimal as argued by Repullo and Saurina (2012). Repullo and Saurina justify GDP growth rate to serve a more reliable proxy for economic cycle measurement.

21 For information how to estimate default probabilities (PD) for low default portfolios, please, see papers by Tasche [Pluto, Tasche (2005)], [Tasche (2013)]. Worth mentioning that in 2001 Tasche provided his comments together with C. Acerbi on behalf of Abaxbank to the second consultative paper on Basel II (cp2; January 16, 2001).

It is also advised by the Basel Committee that bank runs validation regularly, at least annually per model. The objective of the exercise is to keep model updated and arrive at accurate risk component estimates.

One might observe that when risk component model is regularly validated, correlation function resulting from Vasicek model stay unchanged. To be consistent and accurate in capital charge estimation (not only is risk components – i. e. inputs – calculation), **regulator should validate and respectively update or revise the correlation functions, if underlying parameters are shown to fluctuate substantially from year to year.**

Risk concentration has a particular place in risk-management regulation and credit risk management, particularly. The very first relevant paper was published in January 1991 devoted to measuring and controlling large exposures (c121; January 1, 1991). Risk concentration principles (bcbs63; December 01, 1999) were developed only eight years later. Nevertheless, final (comprehensive version of) Basel II paper (bcbs128; June 20, 2006) did not yet have explicit charge for concentration risk.

When managing concentration risk, there are two broad approaches: either the maximum exposure is limited, or bank is penalized for extra concentration. As mentioned by professor Goodhart [Goodhart (2011a), p. 391], former approach was historically chosen (in my opinion, it was easier to monitor rather than the second one) as "an appropriate limit for a single exposure would fall within the range 10-40% of total capital, with 25% being a preferred central point [in 1990]".

European Union regulation puts a cap for maximum exposure. If the exposure is exceeded, the excess capital involved is deducted from current capital. Thus the excess is allowed, but it needs to be funded with capital completely.[22] In Post-Basel III regulatory wave the former (limiting) approach to risk concentration was suggested for implementation (bcbs283; April 15, 2014) where exposure is limited to 25% of capital (CET1; please, see section 5.5 for details), except when lending to SIFIs (it is limited to 15% of CET1).

A number of newsletters that refer to credit risk regulation prescribe certain exception from the general rule. Thus those referred to zero risk-weighting to be assigned for particular assets as follow:

— International Finance Facility for Immunization (bcbs_nl10; January 10, 2006);

— Multilateral Investment Guarantee Agency (bcbs_nl15; January 5, 2010);

— European Stability Mechanism (bcbs_nl17; January 3, 2014);

— European Financial Stability Facility (bcbs_nl17; January 3, 2014);

In case the asset did not fall into trading book (e. g. proprietary position in equities), and it went to banking book special treatment was applicable unless special IRB-models were developed by financial institution for that asset class. General principle of Basel II (bcbs128; June 30, 2006) when defining capital charge for equities in the banking book is to use 300% risk-weighting to listed equities and 400% – for non-listed ones. Post-Basel III

22 Author is grateful to anonymous reviewer for clarification on EU regulation.

regulatory wave has registered a new document to revise approach for equity exposures (bcbs266; December 13, 2013).

Particular attention was devoted by Basel Committee to credit risk transfer realized through loan guarantees and securitization. Very first mention was in the early 1992 (bcbs10a; September 01, 1992), then there was a ten year pause till 2001 and 2002 (wp10 and wp11; October 01, 2001 and October 01, 2002, respectively) with a proposed revision in 2004 (bcbs105; January 01, 2004). After that the discussion continued in 2004-2008 under the heading of credit risk transfer within Joint Forum (joint21; July 31, 2008). Because of collateralized debt obligations- (CDO-) and asset-backed-commercial-paper- (ABCP-) induced 2007-2009 crisis the importance of securitization treatment was revived within the Basel Committee in 2012 with last consultative document published in 2014 (bcbs269; December 19, 2013). 29 comments were submitted to the latter document.

5.2 MARKET RISK REGULATION

Market risk regulation has 43 publications with total volume of 1 362 pages. Most number of papers is broken down in-between consultative papers (16) and final (22). The area can be assessed as being three times less than the credit risk one as the former contributes only to 9% of total number of documents and 8% of total number of pages published by the Basel Committee.

The workstream refers to trading book (i. e. all except banking book) and includes such topics like treatment of netting, foreign exchange and interest rate risk measurement, amendments to Basel accords (I, II, III).

From the very start of market risk measurement and regulation the banking industry was able to justify the necessity to use internal models for regulatory purposes according to Goodhart (2011a; p. 564). Internal model for market risk (exponential moving average) was first introduced[23] in 1989 by JPMorgan and was called RiskMetrics [RiskMetrics (1996)]. Thus internal models for market risk for regulatory purposes were adopted only **7 years** after its theoretical finding when amendment to Basel I to incorporate market risks was published (bcbs24; January 1, 1996). As one remembers it took **12 years** for Vasicek model to be adopted as the internal model for credit risk for prudential purposes.

The Basel II prudential approach for market risk was as follows. Nowadays, the internal model is the Value-at-Risk (VaR).[24] VaR was multiplied by 3 (or 4 if back-testing produced poor results) [bcbs119; November 01, 2005; par. (j) part B.4, p. 41]. The output value was a capital charge for market risk. The shortcoming of the approach as viewed by BCBS experts was that it did not capture tail risk or losses to take place in case of crisis.

This is why Basel 2.5 (bcbs134; October 01, 2007), (bcbs140 and 141; July 22, 2008) (bcbs148 and 158; January 16 and July 01, 2009) targeted to account for the above shortcoming. Stressed VaR was required to be added to the previously estimated market risk charge [bcbs148; January 16, 2009; par. (j) part 4, p. 12]. Confidence level for internal models was kept at 99%.

In the Post-Basel III regulatory wave when fundamental review of the trading book was launched (bcbs219; May 3, 2012), it was proposed to change the risk measure from VaR

23 RiskMetrics definition and brief history of its introduction is available at Wikipedia. URL: http://en.wikipedia.org/wiki/RiskMetrics (accessed November 5, 2014).

24 VaR is the quantile of the portfolio return distribution given predefined confidence level and with no changes to liquidity of the asset.

to Expected Shortfall (ES).[25] In the second consultative paper the confidence level was proposed to be downgraded from 99% to 97.5% (bcbs265; October 31, 2013). As one may trace from Adam et al. (2007) expected shortfall was known since 1999 when it was introduced as a coherent risk measure in Artzner et al. (1999). As follows from Adam et al. (2007) other risk-measures with nicer statistical properties are already known: distortion[26] risk-measure (from 1997) and spectral[27] risk measure (from 2002). Thus one may see that the ES measure was taken on-board mostly **13 years** later (similar to Vasicek model for credit risk).

Fundamental review of the trading book (bcbs219; May 3, 2012) was to large extent triggered by the Basel Committee's concern that large international banks were easily shifting assets from trading to banking books and vice versa to arbitrage and have capital benefit. For the reason of equalizing capital charge for different risks and for comparable transactions a revision of banking and trading books was launched to make banks indifferent to choice of a book (trading or banking). Several criteria were offered to put a watermark between the books [before book definition was predominantly based on valuation principle: held-for-trading (HFT) assets were considered to be part of the trading book; held-to-maturity (HTM) and available-for-sale (AFS) assets were assigned to banking book]: either using the asset maturity (longer maturity asset must be banking book; shorter – trading one), or valuation approach (mark-to-market has to be trading book; mark-to-model – banking book).

5.3 OPERATIONAL RISK REGULATION

Operational risk regulation is based on 25 publications (845 pages in total) of which 6 are consultative papers and 11 are final. One can delineate specifically areas related to operational risk management principles and operational loss data collection exercise. The area is comparable in size (contribution) to marker risk one as it equals to 6% of total number of documents and 5% of total pages published by the Basel Committee.

Though first mention about operational risks occurred during second regulatory wave of the Basel Committee (bcbsc136; July 01, 1989), the operational risk management principles were formulated only 10 years later (bcbs42; September 1, 1998). By that time one of the largest modern notoriously famous operational risk events happened (Barings bank fraud in 1994). Nevertheless, operational risk quantification was introduced only in Basel II (bcbs118; November 1, 2005).

The Basel II (bcbs128; June 30, 2006) approach to operational risk quantification offers four options for banks: basic indicator approach (BIA), simplified standardized approach (SSA), standardized approaches (SA), advanced measurement approaches (AMA). SSA is allowed for certain banks to estimate operational charge based on credit portfolio, not using gross income value. The idea of two former approaches (BIA, SA) is to use gross income as the benchmark for capital charge against operational risk. AMA enables a bank to use statistical model to support capital charge estimation. Confidence level for AMA models is 99.9%, similar to credit risk one (99.9%), but different to market risk one (99%).

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25 ES, also referred to as tail conditional expectation, is the mean value of observations falling below VaR threshold, i. e. by construction it is larger than VaR. ES requires sufficient number of observations to produce robust risk estimate.

26 Distortion risk measure assigns unequal weights to positive and negative values of return distribution (traditionally negative outcomes receive higher weights, than positive to reflect that negative ones are less preferred).

27 Spectral risk measure is integrated vertically (whereas VaR, ES, and distortion measures are integrated horizontally). Thus spectral one enables to obtain reliable and robust risk estimates from theoretical perspective when VaR, ES, distortion measures fail to accomplish it.

Post-Basel III regulatory wave was signaled by the need to revise operational risk regulation, disregarding extensive data survey that was launched in 2008 worldwide against the mentioned approaches (nl13; January 7, 2008), (bcbs160; July 1, 2009). Thus a special paper was issued (bcbs292; October 06, 2014). New approach suggests exchanging basic indicator by business indicator (BI) being a more complicated derivative of bank financials than the former was. Additionally the capital charge is proposed to be explicitly linked to bank size. Basel II operational risk-weighting was derived as the ratio of world industry total operational risk losses divided by industry-wide gross income. Post-Basel III-related shift to business indicator is not clear as no special data collection was neither announced, nor disclosed a posteriori. Thus similar shortcomings are applicable to new operational risk benchmark as they were to basic indicator (conceptually, it was rough risk-measure), but extra negative effect is produced from new regulation as previously collected operational loss statistics becomes incomparable and mostly useless.

5.4 LIQUIDITY RISK REGULATION

Liquidity risk regulation is the smallest workstream in terms of publications. It has overall 20 publications (563 pages) of which 6 are consultative, 10 final papers and 3 are responses to frequently asked questions, 1 report. Liquidity risk domain is smaller in contribution that operational risk one and contributes to only 4% and 3% of total number of documents and pages published by the Basel Committee, respectively.

The workstream consists of liquidity management principles, including managing intraday liquidity and Basel III induced liquidity ratios of liquidity coverage ratio (LCR) and net stable funding ratio (NSFR).

Though as mentioned the workstream is the smallest in terms of publications, it is the oldest one as liquidity risk was discussed at the very on-set of BCBS in 1972-1974 as decribed by Goodhart (2011a; p. 81, Table 3.5, point 9). At that time finding common playing field for liquidity risk regulation was very difficult. To support the argument presented would like to refer to professor Goodhart [Goodhart (2011a), p. 321] who cites 1985 discussions when an opinion was shared that “no single formula is likely to capture all the elements and no single quantitative guideline will ensure adequate liquidity for a range of different banks”.

To present my personal opinion, though unsuccessful worldwide-wise, central bankers participating in liquidity risk regulation discussions benefited from those. That is why it became easier for them to adopt new Basel III ratios that were introduced as a response to notoriously known collapse of Lehman Brothers on September 16, 2008 (reference[28] to Lehman is not an officially stated one by BCBS, but an implicitly understood one).

Thus the novelty of Basel III (bcbs165; December 01, 2009) is to introduce two indicators that evaluate liquidity profile of a bank at a monthly and yearly horizons. The former is called liquidity coverage ratio (LCR) and the latter one is net stable funding ratio (NSFR).

LCR is the ratio of the amount of highly liquid assets and outflows expected within next month. The LCR regulatory minimum was originally set at 100%, but after the first impact study the transitory (temporary) threshold was downward adjusted to 60%. BCBS proposed to calculate LCR in each currency, i. e. to meet the threshold when comparing assets and outflows in the same currency.

28 Author acknowledges anonymous reviewer for underlying the need to check whether BCBS officially wrote in its documents about Lehman case.

NSFR is the ratio of liquid assets maturing in a year and expected outflow past one year. The mandatory threshold was also set to 100%, i. e. a bank has to be able to offset its long-term outflows. When developing NSFR a link between credit and liquidity risks was introduced. There was a requirement that special discounting coefficients are assigned to assets having high creditworthiness ratings from Internal rating models (IRB) of Basel II. Perhaps, because of overcomplicated approach to NSFR calculation or unfavourable impact study results, as of now NSFR was decided to be delayed in implementation (future date of introduction is still to be announced).

Post-Basel III regulatory wave had a document in its set devoted to intraday liquidity management (bcbs225; July 02, 2012). The idea is to have a set of indicators measuring average payment settlement time, number of payments per hours etc. Though ideally necessary tool, it occurred to be difficult to be implemented in software systems. That is why in the final paper (bcbs248; April 11, 2013) requirements were relaxed and formulated more as recommendations.

Stress-testing is an important risk-management tool, but it is separately mentioned in the subsection 5.5. Therefore, recommendation on liquidity stress-testing are mentioned there as part of Basel I Pillar II requirements.

Though not being the Basel Committee publication a paper [Grant (2011)] on liquidity transfer pricing published by Financial Stability Institute of the BIS is recommended when in need to get full picture of liquidity risk management and respective use test.

5.5 RISK AGGREGATION AND CAPITAL DEFINITION

Risk aggregation and capital definition workstream has the objective of aggregation of all the risks and estimating economic capital. As by concept of Basel accords, they were tailored to capture all (known and quantifiable) risks of the credit institution – i. e. to capture aggregate (gross) risk – the accord documents are included in the workstream.

The workstream has 97 publications totaling to 4 249 pages. It includes 13 consultative papers, 22 final documents, 14 reports (majority is on the progress of Basel III implementation), 5 working papers, 4 newsletters, 3 responses to frequently asked questions and 36 QIS documents. In terms of contribution to total number of documents the area is similar to credit risk one and equals to 21%, but in terms on number of pages it exceeds the latter and equals to 26% of total published by the Basel Committee.

The workstream has the following clearly defined topics: approaches to risk aggregation, stress-testing, capital definition (and redefinition according to Basel III), monitoring progress of Basel III and regulatory framework implementation; Basel I, II, III documents.

The very first paper on risk aggregation dealt with balance sheets consolidation (bcbs00b; October 01, 1978). Though important, risk aggregation issue was raised again only 23 and 25 years later when two documents were published. Those were, respectively, papers on risk management practices and regulatory capital (joint4; November 1, 2001) and trends in risk integration and aggregation (joint7; August 1, 2003). Both documents relate to Joint Forum and have a broader scope of application by definition, i. e. financial conglomerates, not limited to credit institutions. Those were mostly principles-style papers. Attention should be drawn to the updated paper (joint25; October 21, 2010) that discuss five approaches to risk aggregation mentioned in the order of increasing accuracy, complexity and preference from both banks' and regulators' perspective: summation;

simple diversification; variance-covariance approach; copula[29] models; full simulation (Monte-Carlo based) models.

Another side of risk aggregation (or economic capital) as formulated in Basel II Pillar II is the stress-testing procedure. Whereas stress-testing is also required to be done under Pillar I for all marginal risks (i. e. separately for credit, market, and operational risks), under Pillar II stress-testing should encompass all risks. If for Pillar I purpose stress-testing is more a sensitivity analysis, for Pillar II purpose it is a scenario analysis or a probabilistic model evaluation. Though introduced in Basel II (bcbs118; November 1, 2005), stress-testing principles and sound practices were combined and presented jointly in a special paper (bcbs147; January 9, 2009). In addition to Basel II the mentioned document recommends running reverse stress-testing, i.e. based on statistical model a financial institution has to identify the thresholds for macroeconomic indicators which being breached imply failure, default or insolvency of the institution itself. Special recommendations were given with respect to liquidity stress-testing (bcbs_wp24 and bcbs_wp25; January 10, 2013) as those should also be incorporated in Basel III liquidity ratios of LCR and NSFR.

Capital is also viewed as a part of this workstream. Basel I (bcbs4a; July 01, 1988) introduced two tier capital structure. Tier 1 included paid-in capital, retained earnings, and hybrid instruments, tier 2 consisted of long-term subordinated debt to be amortized equally during last 5 years. Basel I introduced the basic capital adequacy ratio, CAR (sometimes referred to Cooke ratio by the name at that time Chairman of the Basel Committee). CAR was the ratio of capital to risk-weighted assets (RWA) for credit risk only initially. It was 4% for tier 1 capital and 8% for total capital (tier 1 and 2). Professor Goodhart found important agenda originally formulated by Peter Cooke who challenged whether prudential (particularly capital) ratios should be minimum, target or standard. Though simple in supervision, minimum should have been the least preferred option, in Peter Cooke's opinion, as inter alia in crisis minimum "does not provide an appropriate buffering function for banks themselves" [Goodhart (2011a), p. 556].

Basel II (bcbs128; June 30, 2006) added Tier 3 capital for short-term subordinated debt – though as discussed at Goodhart (2011a; p. 489) for a long time during Basel I discussion and implementation regulatory community was not ready to accept it as part of capital from conservative viewpoint –. Basel II introduced the modified CAR ratio (sometimes referred to McDonough ratio as William McDonough was the Basel Committee Chairman at that time) where the denominator included RWA for credit, market, and operational risks.

Basel III responding to 2007-2009 crisis (bcbs165; December 1, 2009) proposed following adjustment to capital definition. First, core equity tier 1 (CET1) capital was introduced consisting of paid-in capital, retained earnings, but no hybrid instruments included. The CAR minimum for CET1 capital was set 4.5% and for tier 1 – 6.0%. Second, subordinated debt from then must be more loss-absorbing, i. e. incorporate the requirement to write-down debt or exchange it to equity in case of certain triggers are breached; existing subordinated debt instruments should be amortized in 10 years. Third, tier 3 capital was deleted from capital adequacy calculation. Fourth, three capital buffers were introduced to capture the systemically important nature of banking business, 1-3.5%; the stage of economic cycle, 0-2.5% (to dampen the procyclicality effect of Basel II); the need for

29 Discussion on the use of copulas may be found in the sequence of papers by professor Paul Embrechts: Embrechts, McNeil, Straumann (1999), Breymann, Dias, Embrechts (2003), McNeil, Frey, Embrechts (2005). To mention P. Embrechts together with Furrer and Kaufmann provided their comments to third consultative paper on Basel II (cp3; April 29, 2003).

capital conservation, 2.5% (instead of dividend pay-off in any case). All capital buffers are expressed in percent of CET1 capital.

When speaking about capital used for capital adequacy ratio, one has to keep in mind the deductions undertaken. According to Basel II (bcbs128; June 30, 2006) investments in associated companies are deducted if they exceed 15% of the invested entity capital or the sum of such investments exceed 60% of the invested entity capital (deduction is done for the part that exceeds the threshold). Basel III (bcbs164; December 01, 2009) has added another criterion for deduction. Material investment definition was introduced relating to ownership of more than 10% of the investee entity. In case the investment is considered material it is required to be fully deducted from the capital of the invested entity. The non-deducted part is subject to banking book (equity exposure in banking book) or trading book treatment.

5.6 CORPORATE GOVERNANCE ISSUES

Corporate governance workstream has 31 documents (979 pages) of which there are only consultative (10) and final (21) ones. The domain's contribution is somewhat in-between that of market and operational risks as it is 7% and 6% of total number of documents and pages published by the Basel Committee, respectively.

The workstream includes corporate governance principles, remuneration regulation, recommendations for internal audit and interaction with external auditors, internal control and compliance, business continuity principles.

Corporate governance principles were officially introduced in 1999 (bcbs56; September 01, 1999). Then the revision took place every four years in 2005-2006 (bcbs117, 122), in 2010 (bcbs168, 176) and in 2014 (bcbs294; October 10, 2014).

The major innovation in the area of corporate governance brought by Basel III in its 2010 document (bcbs176; October 01, 2010) is explicit delineation of "three lines of defense" within the financial institution. Each line should assess risks and monitor them, as well as control and supervise the risks taken by preceding line of defense. As postulated by the document, first line of defense should consist of front-office managers dealing with clients. Second line of defense should include those who develop and control limits including risk-management and middle-office. Third line of defense is responsible for checking the efficiency of controls and processes established by first two lines. Internal audit should be third line of defense (bcbs223; June 28, 2012).

In fact there are two other lines of defense that exist, not mentioned in the Basel Committee documents. Fourth line of defense is the shareholders (and creditors of loss-absorbing subordinated debt) of the bank. Fifth line of defense is the central bank and deposit insurance agency. The underlying logic is that shareholders would have to take on losses if happen (central bankers want to avoid 'too big to fail' cases having consumed significant taxpayers funds in 2007-2009). When shareholders fail to rule out the situation, and all recovery measures are inefficient, the deposit insurance agency in agreement with the central bank has to start resolution process. **Thus the system might be naturally called as "five lines of defense".**

Special focus in the post-2007-2009-crisis time was devoted to remuneration regulation, namely, large amounts paid to bank executives. Particular concern was attached to cases when bonus payments were not related to high performance of a bank. Royal Bank of Scotland (RBS) is one of the example that triggered discussion in mass media. In 2008 and

2013 RBS has ended the financial year with loss, but still allocated and paid significant bonuses to its managers.[30]

Cases similar to RBS led to the need to unify remuneration principles and practices in order to align risk taken (and risk realized) with amounts allocated for management remuneration. Such principles prescribe first to measure bonuses in all its forms (cash and non-cash, including commodities etc.) and second to manage variable part (link it to risk indicators), and third to introduce deferral for no less than 3 years for the variable part of remuneration (for bank to be able to cancel the deferred variable bonus at all or in part in case risks relating to that bonus take place during next three years after bonus was accrued).

Theoretically the principle is nice and proper and was used by the majority of investment banks even before 2007-2009 crisis (in the form close to the one formulated by regulators). Nevertheless, particular attention should be given to risk-perception of the regulated bank manager. The constraint on the variable part and its deferral may be an incentive for a risk-averse person (e. g. a risk-manager). On the contrary, for front-office staff (client relationship manager) being risk-lovers deferral is similar to a bet (gamble). He or she as a risk-lover would prefer to gamble and play (take on more risk), when he or she is subject to regulation in general (and to deferral in particular). He or she would take more risks than envisaged by regulator (inter alia he or she would target to offset decrease in income because of deferral by taking even higher risk). **That is why closer cooperation of the Basel Committee and regulators with the academic community is suggested to make proper simulation models and to calibrate the remuneration rules to obtain the desired effect of decreased risk-taking with consideration to differentiated risk-perception of bank staff.**

5.7 RECOMMENDATIONS FOR SUPERVISORS

Workstream devoted to supervisors is as large as the one focused on Basel accords. It incorporates 82 documents (3 495 pages) of which 18 are consultative, 41 are final papers; there are 17 reports and 6 working papers. This is one of three core areas in a row with credit risk and capital aggregation as it contributes to 18% of total number of documents and 22% of total number of pages published by the Basel Committee.

The recommendations for supervisors cover such areas as core principles of banking supervision and deposit insurance, dealing with highly leveraged financial institutions, recovery and resolution planning, launching and monitoring regulatory consistency assessment program (RCAP), dealing with financial conglomerates and systemically important financial institutions (including financial stability – FS – issues), arranging supervisory colleges.

Concordat (bcbs00a; September 01, 1975) was the very first published document of the Basel Committee and it refers to interaction of supervisors when in need to run cross-border resolution. Wanted to draw reader attention to the set of papers devoted to highly-leveraged institutions regulations first published in 1999 (bcbs45) with the final document being made public in 2001 (bcbs79; March 22, 2003). Those discussions coupled with the pre-Basel I experience of certain countries[31] having risk-free capital measure enabled easier approval and implementation of leverage ratio in Basel III (bcbs164; December 1, 2009) where leverage ratio is a relationship of capital (CET1) to the sum of the on- and off-balance sheet assets.

30 GBP 1 bn was paid by RBS as bonuses out of GBP 20 bn state support by results of 2008 (URL: http://www.dailymail.co.uk/news/article-1138823/Troubled-RBS-wants-pay-staff-1bn-bonus-taxpayers-20bn-bail-out.html#ixzz2rDJeazVk). Disregarding the loss of GBP 8.2 bn, RBS paid out GBP 0.6 bn as bonuses by results of 2013 (URL: http://www.economist.com/news/world-week/21597975-business-week?frsc=dg%7Ca) (accessed November 05, 2014).

31 According to Goodhart (2011a) those were Japan, Luxembourg, and Switzerland as they measured capital against their liabilities (that can be transformed to capital versus assets ratio).

A dominant and permanent topic for the Basel Committee work is the core principles for banking supervision. Those were first released in September 1997 (bcbs30a). The most recent revised document dates back to September 14, 2012 (bcbs230), i. e. the discussion is publicly available for 15 years. In November 2010 another document of similar nature was offered for publication. Those were core principles for effective deposit insurance systems (bcbs182; November 1, 2010). The comments were not made public, perhaps there were none as the consultation period was shorter than average (only 37 days for 40 page document).

The Basel Committee as per Goodhart (2011a; p. 552) never positioned itself as a standard setter in its early years of 1974-1997. Professor Goodhart complained that it was exactly the shortcoming that the Basel Committee was issuing recommendations with no penalties for disobeying them. 2007-2009 crisis changed that approach. During Basel III regulatory wave a major program was launched: regulatory consistency assessment program (RCAP) on April 3, 2012 (bcbs216). As mentioned in Goodhart (2011a; p. 439) in the early years of 1974-1997 the prerogative for consistency assessments was owned by the International Monetary Fund (IMF), but the launch of the RCAP in 2012 puts clear duties segregation and makes the Basel Committee a more standards setting and controlling body.

The objective of the RCAP program is to evaluate that no arbitrage is available in-between risks and within risks. There are already three interesting reports available with respect to credit risk (bcbs256; July 5, 2013) and market risk (bcbs240 and 267; January 31, 2013 and December 17, 2013, respectively). Let us first focus on credit risk survey discussion and then proceed with market risk one afterwards.

Credit risk survey suggested banks to use hypothetical borrowers to assess risk-weights for them. As was found, the discrepancies by banks equaled to +/– 20% in relevant terms, being much more significant than expected by the Basel Committee. Though it would be ideal to have same risk assessment per each borrower, one has to confess that by construction of Basel II internal model should provide common assessment of risk not *per borrower* (in corporate area) or *per facility* (in retail one), but ***per borrower/facility for a given bank.*** Let us elaborate more to justify the statement.

Basel II (bcbs128; June 30, 2006) asks to use internal loss data of a bank for IRB credit risk models (external data is allowed for use if and only if the representativity of external data against bank portfolio is demonstrated). To be fair to banks (and when assuming for a moment that none of them is seeking for risk (RWA) arbitrage)[32] RCAP credit risks survey results should have been expected. Please, consider an example that two different banks A and B have different workout recovery approaches in general (or A bank's shareholders have tighter relations to some borrower C, in particular). Suppose this borrower C borrows same amount from both banks A and B, but on due date it pays back only to bank A (either because of closer relations to bank A or because of more stringent workout policy of bank A). Then in order to prepare modeling dataset bank A would register borrower C as a non-defaulted client; bank B inversely would register borrower C as a defaulted one. Respectively, when having numerous cases of such differentiated behavior same features of the borrower (e. g. ownership structure, financial ratios etc.) would be statistically significant default determinants for banks of B type; and non-significant for banks of A type. Thus the very requirement of Basel II implies the possibility of unequal credit risk assessment for the same borrower.

32 Author is grateful to anonymous referee for advising to discuss whether the observed discrepancies in risk-weights are solely attributed to banks risk-arbitrage or may have other reasons.

If credit risk models are based on internal statistics, market risk models are built on publicly available market data. That is why opposite to credit risk survey results (where deviation in risk-weights could be expected), market risk survey should have evidenced similar (close) risk estimates between the banks. However, market risk survey resulted in similar conclusions as the credit risk one, i. e. banks internal models produce significantly different risk and capital charge estimates for the same hypothetical cases. To add there was another survey launched by the Basel Committee, but not under RCAP. It was done for the purposes of the fundamental review of the trading book being named "Analysis of the trading book hypothetical portfolio exercise" (bcbs288; September 09, 2014). There is an important persistent trend for the market risk models sanity check performed by regulatory bodies. As mentioned in Goodhart (2011a; pp. 251, 280), the same significant discrepancies (+/–25%) were already observed in 1994 on the eve of the internal market risk models approval (nevertheless, the observed discrepancies did not prevent regulators from taking on board those models).

Basel III regulatory wave was marked by a response to 2007-2009 crisis and one of the problems of 'too big to fail banks'. For the purpose of making banks self-sustainable before central bank capital injection is needed a category of systemically important financial institutions (SIFIs) was introduced for global (bcbs201; July 19, 2011) and domestic (bcbs233; October 11, 2012) entities. The concept is to use indicator approach to nominate banks as SIFIs and to impose capital surcharge on them ranging from 1% to 2.5% (theoretically to 3.5%) of CET1 capital. **To be consistent it is recommended to revise the approach and introduce special threshold levels for SIFIs not limited to capital, but also to liquidity** (as the latter was also observed to be one of causes for bank failures in 2007-2009).

5.8 INFORMATION DISCLOSURE ISSUES

Information disclosure area has 34 documents (1089 pages). Those include 9 consultative, 12 final papers, 11 reports, and 2 working papers. The area is similar in contribution to market risk one and has 8% and 7% contribution to total number of documents and pages published by the Basel Committee.

The workstream consists of three general areas: the initial discussion about the information disclosure for trading and derivatives, incorporation of changes to Basel II Pillar III standards on disclosure changes resulting from Basel III, and other.

Pillar III activity started from resolving the need to add transparency to trading operations. The idea to standardize risk disclosure was first born in June 1979 [Goodhart (2011a), p. 471] when Mr. Cummings wanted to obtain the Basel Committee support on draft document named "Disclosures in financial statements in banks". But at that time Basle Committee was not eager to support the proposal.

On May 1, 1995 the first formalized framework (bcbs19) was published by the Basel Committee. Overall there were 9 publications till December 1, 1999 devoted to derivative disclosure. After that it was generalized to currently known form of Basel II Pillar III. The development of Pillar III and derivative-disclosure-related activity was similar to liquidity risk regulation evolution from my point of view.[33]

From one side, presenting information to public (and the bank's competitors inter alia) may distort bank's competitive advantages in general (though it is difficult to extract something

33 Author is grateful to anonymous reviewer for proposing to discuss what pros and cons were there when working of information disclosure standards for derivatives, what its outcome was and potentially why.

more than trends when only high-level non-transactional data is available). The most constraint when trying to reach worldwide consensus on information disclosure is that the discussion gets about a level of certain institutions, it gets to a level of national banking systems. In my view, the inter-economy competition was the one that produced key obstacle to information (and derivatives particularly) disclosure standards unification before year of 2000.

From another side, information disclosure in general is a useful tool making banking performance more transparent. To add that the degree of usefulness positively depend with the state of unification of presented data. Of course, it is better to know more about a bank and its risks taken, than not to know. But to compare this particular bank to industry-averages and to assess whether a bank is over-prudent or over-risk-taking, one has to obtain information easy to be processed by analysts or researchers.

Thus information disclosure activity at its start challenged Basel Committee-member economies, but was able to benefit central bankers, creditors, investors and other stakeholders. Obviously it turned out difficult to agree on the issue by balancing all pros and cons. That is why like with liquidity risk discussion individual central banks gathered useful information and having enough regulatory power upgraded home information disclosure standards, including those on derivatives. As a result one may bring an example of the United States of America and Canada that have unified derivative disclosure standards that allow to run deep research – for details, please, refer to Ashraf, Goddard, Altunbas (2005) and Dai, Lapointe (2010), respectively –. On opposite, to undertake similar exercise for the European Union (EU) enormous manual work has to be done – for the unique research on EU banks use of derivatives, please, refer to Gomayun, Penikas, Titova (2012) –.

Officially Basel II Pillar III was proposed on January 01, 2000 (bcbs65). After that it had two principal modifications. One took place during the Basel III regulatory wave; another – during Post-Basel III regulatory wave. Basel III (bcbs164, 165; December 01, 2009) has introduced new terms and concepts including capital definition, leverage ratios, liquidity ratios, remuneration rules. Those had to be reflected in the information disclosure standards. For this reason Pillar III revision consultative document was published (bcbs286; June 24, 2014). The document is a first stage review covering issues related to credit, market, counterparty credit risks. Other risks and issues would be reflected in the second stage of consultation.

Another challenge for Pillar III workstream also came in Post-Basel III regulatory wave. That was the need to review approaches to effective risk data aggregation and risk reporting (bcbs222; June 26, 2012). The paper focused on information systems readiness to provide correct and up-to-date information. There were few (9) comments sent on the paper. A progress report on the principles implementation was published on December 18, 2013 (bcbs268). It is notable that the paper was published 35 years after the concern was first raised within the Basel Committee. According to [Goodhart (2011a), p. 132] "[in 1977] Bonnardin stated that the question of any possible surveillance or limits (which he suggested was 'premature') must be preceded by the establishment of common principles for recording data".

5.9 OTHER ISSUES

Other issues are those that seem to be peripheral to the Basel Committee activity upon author's opinion and thus include papers that cannot be attributable to any of the above mentioned workstreams. The residual topics contribute to 6% and 5% of total number of documents and pages published by the Basel Committee.

There are 27 such documents (793 pages) of which 8 are consultative and 17 are final papers. Topics covered capture electronic banking and associated risks, anti-money laundering (AML) and know your client (KYC) principles, mortgage insurance and longevity risk discussion, potential problem of passing through the millennium age (year 2000 problem).

Risk-management for electronic banking services preoccupied the Basel Committee since March 1998 (bcbs35) till July 2003 (bcbs99). Though three out of 6 papers were consultative, responses received (if any) were not disclosed to public.

Anti-money laundering subject accompanied the Basel Committee activity from the very Basel I publication with three distinct stages: (a) debut paper was published in December 1988 (bcbsc137); (b) after a pause of 13 years the discussion was revived with the second paper published in January 2001 (bcbs77) and ending by the Joint Forum publication in April 2008 (joint20); (c) third stage started in the Post-Basel III regulatory wave with the publication of the consultative document on sound practices for managing risks related to anti-money laundering in June 2013 (bcbs252) with its final version made public on January 15, 2014 (bcbs275).

Another two issues were quiet recent and were raised within the Joint Forum: mortgage insurance and longevity risk. If the former is a response to 2007-2009 crisis (though published only in 2013, joint 30 and joint 33), the latter is more universal recommending supervisors and banks how to consider risks related to ageing population and being published in 2013 also (joint 31 and joint 34).

The Basel Committee was concerned about the potential problems arising from shifting the millennium date of 01.01.2000 for four years having issued respectively 4 papers since 1997 (bcbs31) till 1999 (bcbs59). The papers were prepared for supervisors for them to insure that banks smoothly transition the unique date of millennium.

6 Concluding Remarks

The Basel Committee on Banking Supervision was established in 1974. However, by now there was only one research of relevance that dealt with the economic history of the Basel Committee. That was the book by Professor Goodhart [Goodhart (2011a)], but it focused on the early history of the committee of 1974-1997 (covering Concordat and Basel I times). Current research is a natural extension of the work started by Professor Goodhart as it covers the whole historical period of the last 40 years. Professor Goodhart based his research on the Basel Committee archival material as for Concordat and Basel I periods the Basel Committee did tend to publish neither consultative[34] papers, nor comments received on those consultative papers. Current research is based on richer material of consultative papers and comments published by the Basel Committee on the web that enable to trace the logic of banking regulation evolution for the whole period of 1974-2014.

Since its establishment in 1974 and till 2014 the Basel Committee has developed 453 documents of 16 k pages in volume serving as the basis for the world unified standards of risk management and risk supervision for financial (and notably credit) institutions. Research justified five regulatory waves of banking regulation development by the Basel Committee: Concordat (1974-1986), Basel I (1987-1998), Basel II (1999-2008), Basel III (2009-2011), and Post-Basel III (2012-2014).

34 There were no consultative papers at all before 1987; after 1987 consultative papers were published if related to credit and market risks, financial conglomerates supervision, electronic banking and core principles of banking supervision (for other topics consultative papers were not made public).

A list of stylized facts describing the banking regulation development by the Basel Committee was formulated. To summarize those 109 out of total 453 documents published by the Basel Committee are consultative papers for which 2290 comments from 853 unique individuals (entities) from 83 countries were received.

Further research was held by workstreams accommodating for the various activities of the Basel Committee: credit, market, operational, liquidity risk regulation; risk aggregation and capital definition, corporate governance, recommendations for supervisors, information disclosure and other issues.

The conducted research is of value as it enabled to trace linkages in-between the documents that were not and are not still officially linked, though should be (e. g. economic cycle definition for Basel II IRB models should be taken from Basel III paper). As a research outcome recommendations to develop banking risk regulation are formulated, which include the following:

— The need to expand validation requirement from risk components produced by banks to correlation functions offered by regulators;

— The need to formulate SIFI buffer in terms of capital, liquidity and leverage as the three indicators were revealed by 2007-2009 crisis as being the core sources of bank failures, not limited to capital;

— The need to abandon one of Basel III novelties: either capital buffer for SIFIs or multiplier in RWA correlation formula for exposures to SIFIs;

— The capital buffer values and remuneration rules should be calibrated and theoretically justified;

— Calibration and unification of confidence levels used for different risk capital charge should be done;

The key conclusion is that more cooperation of the Basel Committee and academic community is needed for the benefit of regulators and commercial banks to avoid the delay in proper research findings' implementation – e. g. there passed 12 years for Vasicek model for credit risk; 7 years for VaR and 13 years for ES (expected shortfall) measures for market risk to be approved by the Basel Committee for the prudential use –.

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APPENDIX: LIST OF TABLES

SUMMARY OF BCBS PUBLICATIONS BY TOPICS, SUBTOPICS AND TYPES

TABLE A.1

Code	Category	Number of documents published								% of total	Number of pages published								% of total
		Final	Cons.	QIS	WP	FAQ	Report	Newsl.	Total		Final	Cons.	QIS	WP	FAQ	Report	Newsl.	Total	
1	Credit risk	6	4	2	3		2	3	**20**	**4**	277	166	7	232		57	12	**751**	**5**
	Concentrations	6	1		1	1			**9**	**2**	127	36		36	8			**207**	**1**
	Securitisation	3	4		3		1		**11**	**2**	71	162		101		70		**404**	**2**
	Credit risk transfer	2	2						**4**	**1**	190	170						**360**	**2**
	Accounting	8	3						**11**	**2**	208	65						**273**	**2**
	Cpty credit risk	2	2		1	4			**9**	**2**	55	52		24	78			**209**	**1**
	(non-)central cpty	3	5						**8**	**2**	67	155						**222**	**1**
	Validation				1			2	**3**	**1**				120			10	**130**	**1**
	Equity Exposures	1	1		1				**3**	**1**	14	16		47				**77**	**0**
	EAD	5							**5**	**1**	138							**138**	**1**
	CRM	2	1						**3**	**1**	23	25						**48**	**0**
	EL / provisions	2			1				**3**	**1**	13			7				**20**	**0**
	LGD	1						1	**2**	**0**	12						1	**13**	**0**
	RW							3	**3**	**1**							3	**3**	**0**
	Credit risk Total	**41**	**23**	**2**	**11**	**5**	**3**	**9**	**94**	**21**	**1,195**	**847**	**7**	**567**	**86**	**127**	**26**	**2,855**	**18**
2	Market risk	11			1	1	1	1	**15**	**3**	276			59	19	19	1	**374**	**2**
	Netting	3	2						**5**	**1**	33	8						**41**	**0**
	FX risk	1	3						**4**	**1**	44	85						**129**	**1**
	Interest rate risk	2	3						**5**	**1**	83	118						**201**	**1**
	Basel 1.5	3							**3**	**1**	130							**130**	**1**
	Basel 2.5	2	5						**7**	**2**	48	100						**148**	**1**
	Basel 3.5		3				1		**4**	**1**		275				64		**339**	**2**
	Market risk Total	**22**	**16**		**1**	**1**	**2**	**1**	**43**	**9**	**614**	**586**		**59**	**19**	**83**	**1**	**1,362**	**8**
3	Operational risk	6	2	4	1			1	**14**	**3**	196	109	78	41			2	**426**	**3**
	Op. Risk Principles	5	4						**9**	**2**	133	88						**221**	**1**
	Op. Risk Data			1				1	**2**	**0**			197				1	**198**	**1**
	Operational risk Total	**11**	**6**	**5**	**1**			**2**	**25**	**6**	**329**	**197**	**275**	**41**			**3**	**845**	**5**
4	Liquidity risk	7	4			1	1		**13**	**3**	211	123			22	69		**425**	**3**
	LCR	2				2			**4**	**1**	76				20			**96**	**1**
	NSFR	1	2						**3**	**1**	17	25						**42**	**0**
	Liquidity risk Total	**10**	**6**			**3**	**1**		**20**	**4**	**304**	**148**			**42**	**69**		**563**	**3**
5	Aggregation and K	7	3	1	1		1		**13**	**3**	354	112	21	31		47		**565**	**3**
	Stress-testing	2	1		2				**5**	**1**	50	24		101				**175**	**1**
	K definition (B III)	2	2			3			**7**	**2**	57	62			67			**186**	**1**
	B III Impl.			4			11		**15**	**3**			147			236		**383**	**2**
	Reg. Framework				1		2		**3**	**1**				20		61		**81**	**0**
	Basel I	3	2		1				**6**	**1**	34	60		64				**158**	**1**
	Basel II	6	4	27				4	**41**	**9**	1,002	499	652				9	**2,162**	**13**
	Basel III	2	1	4					**7**	**2**	154	80	305					**539**	**3**
	Aggregation and K Tota	**22**	**13**	**36**	**5**	**3**	**14**	**4**	**97**	**21**	**1,651**	**837**	**1,125**	**216**	**67**	**344**	**9**	**4,249**	**26**
6	Corp. governance	2							**2**	**0**	40							**40**	**0**
	Remuneration	2	1						**3**	**1**	97	59						**156**	**1**
	Audit	9	4						**13**	**3**	270	109						**379**	**2**
	Internal Control	2							**2**	**0**	65							**65**	**0**
	Compliance	2	1						**3**	**1**	47	14						**61**	**0**
	BCP	1	1						**2**	**0**	44	42						**86**	**1**
	CG Principles	3	3						**6**	**1**	99	93						**192**	**1**
	Corp. Governance Total	**21**	**10**						**31**	**7**	**662**	**317**						**979**	**6**
7	Supervisors	13	2		1		4		**20**	**4**	283	47		59		117		**506**	**3**
	Highly leveraged Inst.	3					1		**4**	**1**	47					32		**79**	**0**
	Recovery, resolution	5	2		1		4		**12**	**3**	101	120		75		260		**556**	**3**
	Core principles	8	8		1				**17**	**4**	413	388		63				**864**	**5**
	RCAP	3					6		**9**	**2**	88					407		**495**	**3**
	Conglomerates	3	2				1		**6**	**1**	333	199				28		**560**	**3**
	Sup.colleges	2	2						**4**	**1**	59	58						**117**	**1**
	SIFIs and FS	4	2		3		1		**10**	**2**	81	48		150		39		**318**	**2**
	Supervisors Total	**41**	**18**		**6**		**17**		**82**	**18**	**1,405**	**860**		**347**		**883**		**3,495**	**22**

SUMMARY OF BCBS PUBLICATIONS BY TOPICS, SUBTOPICS AND TYPES (cont'd)

TABLE A.1

Code	Category	Number of documents published								% of total	Number of pages published								% of total
		Final	Cons.	QIS	WP	FAQ	Report	Newsl.	Total		Final	Cons.	QIS	WP	FAQ	Report	Newsl.	Total	
8	Info. disclosure	5	4		2		6		**17**	**4**	145	172		108		180		**605**	**4**
	Trading and deriv.	3	1				5		**9**	**2**	124	36				167		**327**	**2**
	Info - B III	4	4						**8**	**2**	78	79						**157**	**1**
	Info. Disclosure Total	**12**	**9**		**2**		**11**		**34**	**8**	**347**	**287**		**108**		**347**		**1,089**	**7**
9	E-banking	3	3						**6**	**1**	93	86						**179**	**1**
	AML and KYC	8	3					1	**12**	**3**	204	66					1	**271**	**2**
	Mortgage Insurance	1	1						**2**	**0**	40	42						**82**	**1**
	Longevity Risk	1	1						**2**	**0**	35	30						**65**	**0**
	Year 2000 issue	3					1		**4**	**1**	18					22		**40**	**0**
	Other	1							**1**	**0**	156							**156**	**1**
	Other Total	**17**	**8**				**1**	**1**	**27**	**6**	**546**	**224**				**22**	**1**	**793**	**5**
	TOTAL	**197**	**109**	**43**	**26**	**12**	**49**	**17**	**453**	**100**	**7,053**	**4,303**	**1,407**	**1,338**	**214**	**1,875**	**40**	**16,230**	**100**

SOURCES: BIS and author's elaboration.

DOCUMENTS DECOMPOSITION BY SOURCE: JOINT FORUM AND NON JOINT FORUM

TABLE A.2

Category	Number of docs				Number of pages			Joint forum as % of total	
	Code	Non joint forum	Joint forum	Total	Non joint forum	Joint forum	Total	# docs	# pages
Credit risk	1	87	7	**94**	2,248	607	**2,855**	7	21
Market risk	2	43	0	**43**	1,362	0	**1,362**	0	0
Operational risk	3	24	1	**25**	801	44	**845**	4	5
Liquidity risk	4	19	1	**20**	538	25	**563**	5	4
Aggregation and K	5	94	3	**97**	3,963	286	**4,249**	3	7
Corp. governance	6	28	3	**31**	859	120	**979**	10	12
Supervisors	7	73	9	**82**	2,911	584	**3,495**	11	17
Info. disclosure	8	30	4	**34**	944	145	**1,089**	12	13
Other	9	19	8	**27**	364	429	**793**	30	54
Total		**417**	**36**	**453**	**13,990**	**2,240**	**16,230**	**8**	**14**

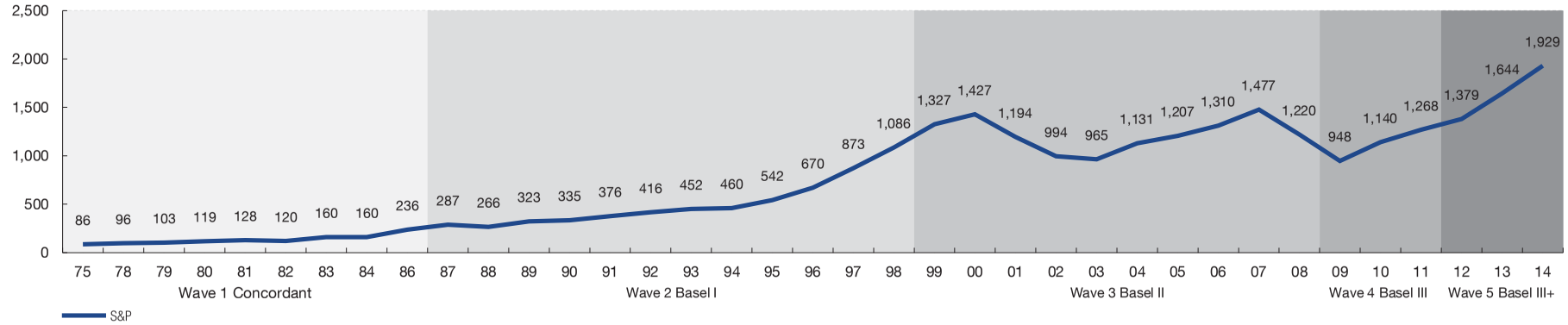
SOURCES: BIS and author's elaboration.

OVERVIEW OF 5 REGULATORY WAVES OF THE BASEL COMMITTEE ON BANKING SUPERVISION HISTORY OF REGULATORY DOCUMENTS PUBLICATION

TABLE A.3

Regulatory wave	Wave 1 Concordant									Wave 2 Basel I															Wave 3 Basel II												Wave 4 Basel III			Wave 5 Basel III+			Total
# docs	Years									Years															Years														Years			Years			
Code	75	78	79	80	81	82	83	84	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14					
1 Credit risk						1			1					2	1		3	1			1	6	6	6	1		4	9	6		5	4	5	6	6	12	8	**94**					
2 Market risk				1												4	2	3	4	2	1	2	1			1	2	2		1	2	5		4	2	2	2	**43**					
3 Operational risk												1									1			4	2	3	1	*1*	*1*	2	1	1	3	2			2	**25**					
4 Liquidity risk															1								1						1		3	1	2	1	1	2	7	**20**					
5 Aggregation and K		1	1							1	3										1	3		10	9	4	3	8	5	1	1	7	10	5	7	9	8	**97**					
6 Corp. governance								1		1		1	1								2	1	1	2	2	1		3	2		2		4	2	1	2	2	**31**					
7 Supervisors	1		1		1		2						2		2			1	2	1	1	6	2	4	1	3	2	1	6		1	5	8	8	7	5	9	**82**					
8 Info. disclosure																		2	1	1	3	4	2	3	1	2	1						1	2	2	5	4	**34**					
9 Other											1									1	2	2	1	4	2	4	1	1		1	1					5	1	**27**					
TOTAL	**1**	**1**	**2**	**1**	**1**	**1**	**2**	**1**	**1**	**2**	**4**	**2**	**3**	**2**	**4**	**4**	**5**	**7**	**7**	**5**	**12**	**24**	**14**	**33**	**18**	**18**	**14**	**25**	**21**	**5**	**16**	**23**	**33**	**30**	**26**	**42**	**43**	**453**					

Regulatory wave	Wave 1 Concordant									Wave 2 Basel I															Wave 3 Basel II												Wave 4 Basel III			Wave 5 Basel III+			Total
# pp	Years									Years															Years														Years			Years			
Code	75	78	79	80	81	82	83	84	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14					
1 Credit risk						9			18					11	11		13	9			39	190	334	134	45		230	375	96		253	149	69	135	170	345	220	**2,855**					
2 Market risk				7												121	31	83	92	75	2	23	26			44	45	82		15	40	109		144	139	171	113	**1,362**					
3 Operational risk												7									9			81	43	105	8	2	36	33	1	197	122	90			111	**845**					
4 Liquidity risk															15								27						25		108	44	122	22	22	101	77	**563**					
5 Aggregation and K		11	3							34	59										1	128		398	340	333	330	367	439	1	73	314	582	158	176	292	210	**4,249**					
6 Corp. governance								6		32		21	61								65	14	23	47	39	14		85	74		48		178	87	29	71	85	**979**					
7 Supervisors	5		2		4		12						17		27			119	35	46	131	374	74	112	56	25	103	28	258		19	235	428	426	288	256	415	**3,495**					
8 Info. disclosure																		70	23	36	115	139	41	84	24	118	35						12	43	54	134	161	**1,089**					
9 Other											4									22	31	15	37	243	29	74	9	27		1	89					179	33	**793**					
TOTAL	**5**	**11**	**5**	**7**	**4**	**9**	**12**	**6**	**18**	**66**	**63**	**28**	**78**	**11**	**53**	**121**	**44**	**281**	**150**	**179**	**393**	**883**	**562**	**1,099**	**576**	**713**	**760**	**966**	**928**	**50**	**631**	**1,048**	**1,513**	**1,105**	**878**	**1,549**	**1,425**	**16,230**					



SOURCES: Yahoo.finance, BIS and author's elaboration.

TOP-50 COMMENTERS

TABLE A.4

#	Commenter Name	# comments	Country
1	Canadian Bankers Association	41	Canada
2	French Banking Federation	41	France
3	Japanese Bankers Association	40	Japan
4	Hong Kong Association of Banks	33	Hong Kong SAR, China
5	Deutsche Bank	28	Germany
6	Standard Bank	27	United Kingdom
7	Institute of International Finance	26	United States
8	International Banking Federation	25	United Kingdom
9	British Bankers Association	25	United Kingdom
10	Barclays	25	United Kingdom
11	UniCredit	22	Italy
12	Royal Bank of Scotland	21	United Kingdom
13	UBS	20	Switzerland
14	International Swaps and Derivatives Association (ISDA)	20	United States
15	European Banking Federation	20	Belgium
16	Saudi Banks	19	Saudi Arabia
17	German Banking Industry	19	Germany
18	HSBC	18	Hong Kong SAR, China
19	World Council of Credit Unions	17	United States
20	European Association of Co-operative Banks	17	Belgium
21	BNP Paribas	17	France
22	WSBI-ESBG	17	Belgium
23	Italian Banking Association	16	Italy
24	Austrian Federal Economic Chamber	16	Austria
25	Australian Bankers Association	15	Australia
26	Chris Barnard	15	Germany
27	Standard & Poors	15	United States
28	Dutch Banking Association	14	Netherlands
29	First Rand	13	South Africa
30	Deutsche Boerse Group	13	Germany
31	Swedish Bankers Association	13	Sweden
32	European Association of Public Banks	12	Belgium
33	Zentraler Kreditausschuss	12	Germany
34	American Bankers Association	12	United States
35	JP Morgan Chase	11	United States
36	National Research University Higher School of Economics	10	Russian Federation
37	Nomura	10	Japan
38	Credit Suisse	10	Switzerland
39	Dubai Financial Services Authority	9	United Arab Emirates
40	Norges Bank	9	Norway
41	Polish Financial Supervision Authority	9	Poland
42	Zhen Li	9	China
43	Santander	9	Spain
44	Bank of America	9	United States
45	Bank of New York Mellon	9	United States
46	State Street	9	United States
47	CME	8	United States
48	Jacques Préfontaine	8	Canada
49	Goldman Sachs	8	United States
50	The Clearing House Association L.L.C	8	United States
51	ING	8	Netherlands
	TOTAL	**934**	

SOURCES: BIS and author's elaboration.
NOTE: Commenters having sent at least 8 comments are included in the table.

COMMENTS AND COMMENTERS DECOMPOSITION BY TYPE (PROFESSIONAL AFFILIATION) OF A COMMENTER TABLE A.5

#	Commenter Name	# comments	% of total comments	# members	% of total comments
1	Commercial Bank	677	30.6	169	19.8
2	Other fin. company	423	19.1	263	30.8
3	Banking Association	339	15.3	49	5.7
4	Other Association	226	10.2	83	9.7
5	Authorities	150	6.8	76	8.9
6	Individual	116	5.3	76	8.9
7	Audit, consulting, rating	85	3.8	34	4.0
8	Insurance Co.	46	2.1	26	3.0
9	Academics	39	1.8	28	3.3
10	Exchange	35	1.6	10	1.2
11	Other Federation	30	1.4	17	2.0
12	Securitisation Forum	15	0.7	4	0.5
13	IT company	9	0.4	4	0.5
14	Asset management	8	0.4	6	0.7
15	Manufacturing	8	0.4	6	0.7
16	Payment system	3	0.1	2	0.2
	TOTAL	**2,209**	**100.0**	**853**	**100.0**
	Subtotals				
	Banks + Banking Assoc.	1,016	46.0	218	25.6
	Academics + Indiv.	155	7.0	104	12.2

SOURCES: BIS and author's elaboration.

COMMENTS RECEIVED BY COUNTRY OF ORIGIN

TABLE A.6

#	Country GDP - # Comments	Total comments	GDP, $ bn	GDP per capita, $
1	United States	520	16,800	53,143
2	United Kingdom	322	2,521	39,337
3	Germany	184	3,635	45,085
4	Belgium	155	508	45,387
5	Japan	108	4,902	38,492
6	France	104	2,735	41,421
7	Canada	78	1,827	51,958
8	Italy	57	2,071	34,619
9	Hong Kong SAR, China	55	274	38,124
10	Netherlands	54	800	47,617
11	Australia	48	1,561	67,468
12	Switzerland	48	650	80,477
13	Spain	31	1,358	29,118
14	Austria	31	416	49,054
15	Denmark	29	331	58,894
16	South Africa	28	351	6,618
17	China	28	9,240	6,807
18	Singapore	25	298	55,182
19	Sweden	24	559	58,269
20	Saudi Arabia	24	745	25,852
21	Korea, Rep.	23	1,305	25,977
22	Poland	19	518	13,432
23	Finland	18	257	47,219
24	Russian Federation	17	2,097	14,612
25	India	16	1,877	1,499
26	Norway	15	513	100,819
27	United Arab Emirates	11	384	41,692
28	Luxembourg	10	60	111,162
29	Thailand	8	387	5,779
30	Mexico	7	1,261	10,307
31	Ireland	7	218	47,400
32	Czech Republic	7	198	18,861
33	Brazil	5	2,246	11,208
34	Portugal	4	220	21,035
35	Ukraine	4	177	3,900
36	Hungary	4	130	13,134
37	New Zealand	4	186	41,556
38	Peru	4	202	6,660
39	Argentina	4	612	14,760
40	Israel	3	291	36,151
41	Turkey	3	820	10,946
42	Venezuela, RB	3	438	14,415
43	Malta	3	10	22,780
44	Bahrain	3	33	24,613
45	Malaysia	3	312	10,514
46	Colombia	3	378	7,826
47	Egypt, Arab Rep.	2	272	3,314
48	Kuwait	2	183	56,367
49	Bulgaria	2	53	7,296
50	Georgia	2	16	3,602
51	Slovak Republic	2	96	17,689
52	Mauritius	2	12	9,210
53	Trinidad and Tobago	2	25	18,373
54	Guatemala	2	54	3,478
55	Barbados	2	4	14,917
56	Iceland	2	15	45,263
57	Chile	2	277	15,732
58	Armenia	1	10	3,505

COMMENTS RECEIVED BY COUNTRY OF ORIGIN (cont'd) TABLE A.6

#	Country GDP - # Comments	Total comments	GDP, $ bn	GDP per capita, $
59	Pakistan	1	237	1,299
60	Ecuador	1	90	5,720
61	Jamaica	1	14	5,290
62	Isle of Man	1	4	49,817
63	Estonia	1	24	18,478
64	Aruba	1	3	25,355
65	Indonesia	1	868	3,475
66	Sri Lanka	1	67	3,280
67	Tanzania	1	33	695
68	Macao SAR, China	1	52	91,376
69	Burundi	1	3	267
70	Belize	1	2	4,834
71	Guyana	1	3	3,847
72	Greece	1	242	21,910
73	Oman	1	81	22,181
74	Lebanon	1	44	9,928
75	Philippines	1	272	2,765
76	Bangladesh	1	130	829
77	Costa Rica	1	50	10,185
78	Paraguay	1	30	4,403
79	Puerto Rico	1	103	28,529
80	Bahamas, The	1	8	21,908
81	Monaco	1	6	163,026
82	Zimbabwe	1	13	905
83	Honduras	1	19	2,291
	TOTAL	**2,209**	**70,125**	

SOURCES: BIS, World Bank and author's elaboration.