An Analysis of Economic Capital Allocation of Global Banks

Petr Teply, Ondrej Vejdovec

Abstract—There are three main ways of categorizing capital in banking operations: accounting, regulatory and economic capital. However, the 2008-2009 global crisis has shown that none of these categories adequately reflects the real risks of bank operations, especially in light of the failures Bear Stearns, Lehman Brothers or Northern Rock. This paper deals with the economic capital allocation of global banks. In theory, economic capital should reflect the real risks of a bank and should be publicly available. Yet, as discovered during the global financial crisis, even when economic capital information was publicly disclosed, the underlying assumptions rendered the information useless. Specifically, some global banks that reported relatively high levels of economic capital before the crisis went bankrupt or had to be bailed-out by their government. And, only 15 out of 50 global banks reported their economic capital during the 2007-2010 period. In this paper, we analyze the changes in reported bank economic capital disclosure during this period. We conclude that relative shares of credit and business risks increased in 2010 compared to 2007, while both operational and market risks decreased their shares on the total economic capital of top-rated global banks. Generally speaking, higher levels of disclosure and transparency of bank operations are required to obtain more confidence from stakeholders. Moreover, additional risks such as liquidity risks should be included in these disclosures.

Keywords—global crisis, economic capital, risk management, risk allocation, bank

I. INTRODUCTION

THERE are three main ways of categorizing capital in banking operations: accounting, regulatory and economic capital [7]. However, the 2008/2009 global crisis has shown that none of these categories adequately reflects the real risks of bank operations, especially in light of the failures Bear Stearns, Lehman Brothers or Northern Rock. In this paper, we deal with the economic capital allocation of global banks. In theory, economic capital should reflect the real risks of a bank and should be publicly available [15]. However, as discovered during the global financial crisis, even when the economic capital information was publicly disclosed, the underlying assumptions rendered the information useless. The paper continues with the following structure: Section 2 presents a theoretical background of economic capital management. In Section 3, we provide an empirical analysis of economic capital allocation of global banks during the observation period. The last section 4 concludes our research and states final remarks.

II. THEORETICAL BACKGROUND

In this paper, we deal with economical capital that has traditionally been contrasted with that of regulatory capital under Basel I and Basel II rules (despite the fact that both capital measures should converge into themselves in the long-run as discussed by, for instance, [11] or [13]).

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Basel II incorporated many elements of the concept of economic capital as developed in late 1980s reflecting the increasing application of statistical methods, IT and computer sciences. The whole approach is now based on mathematics, statistics and highly sophisticated approaches. Basel II enabled banks to use their own internal models through, for instance, in applying an advanced internal ratings- based approach ("A-IRB"). These components are introduced in Basel II and are taken into account for the capital requirement calculation. As a result, while Basel II might appear to be a more realistic approach to the estimation of real exposure to risks and resultant capital requirements, in reality, these standards did not accurately account for real risk.

Since its introduction in 1980s, the models measuring economic capital have developed and changed substantially. JP Morgan was the first company to report its economic capital in its 1999 financial statements. Currently, most of the large financial companies use the economic capital approach for risk management and decision making. There are some differences between regulatory and capital. While a definition of regulatory capital is relatively strict and well defined, no unique definition of economic capital exists. Each bank or company uses individual definitions according to its specific needs, quality of data or length of time series available. But it should hold that all the kinds of risks which the bank is facing should be incorporated into the economic capital calculation method. Of course, the amount and intensity of risks differ among the banks over time. We therefore have to keep in mind that computations used in different banks are not fully comparable. The economic capital modelling should represent the amount of capital which should cover all unexpected losses caused by the bank's risk exposure. Figure 1 depicts main the differences between economic and regulatory capital. We can see that regulatory capital should cover both expected losses (reflected in bank´s provision) and unexpected losses excluding the extreme events. Economic capital, on the other hand, should cover all unexpected losses [7].
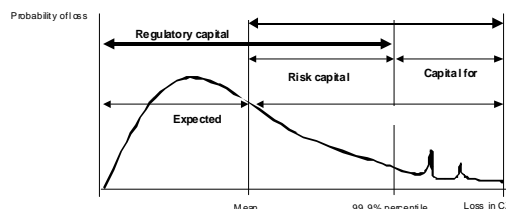

Fig. 1 Difference between regulatory and economic capital
Source: mejstrik et al. (2008)

Even though the basic intuition behind the economic capital concept might seem quite straightforward, no unique definition or application currently exists. For instance, Mejstřík et al. [7] states "Economic capital is a buffer against future, unexpected losses brought about by credit, market, and operational risks inherent in the business of lending money."

On a related note, Van Lelyveld [18] and [1] offer the following definition: "Economic capital can be defined as the amount of capital that a transaction or business unit requires in order to support the economic risk it originates, as perceived by the institution itself." Alternatively, Chorafas [5] defines economic capital as "…the amount necessary to be in business – at a 99% or better level of confidence – in regard to assume risks". The global bank regulator BCBS [3] presents economical capital as „quantum of capital that a firm determines is prudent, desirable and achievable over the long term in the absence of regulatory requirement". To summarize, all definitions reflect a key purpose of economic capital management: to reflect the real known risks of a bank.

III. EMPIRICAL ANALYSIS

A. Data sample description

We have created our own database for our research. First, we have prepared a dataset of the top 50 world banks as ranked in mid-2008 (i.e. before the financial crisis culminated) based on the list of top world banks published in [1]. The reason behind this is that we not only want to see the development of economic capital of individual banks, but also the overall development of a sample of the banks. We look at the top-rated banks as seen before crisis and monitor their development over four years with the special focus on their economic capital management [16]. Due to survival bias, the sample would look different in the final year of our analysis as some of the banks ceased to exist during the financial crisis or were acquired by stronger competitors. However, from our point of view, we would not record the most interesting stories in the banking world if we started with the most recent list of top-rated banks. The reason is that some banks would not be in the list any more either due to fact that they went bankrupt or were so seriously affected by the crisis that they cannot be considered as top-rated any more.

We focus on years 2007-2010 in our analysis. With this approach we are able to cover the period before, during and after the crisis. This is in line with the above indicated scope of interest – we took a sample of top-rated "before-crisis" banks and monitored their development during and after the crisis with a special focus on observing economic capital reporting. As we have discovered, the economic capital and its composition are not commonly reported figures and are therefore impossible to be easily compared in any widespread database such as Bankscope. For this reason we have chosen a different approach. We have collected the annual reports of all the banks in the sample for all 4 researched years (i.e. 200 annual reports in total) and created our own database. Some of the banks have their risk reports separately from annual reports, in which case we tried to search for required data in other reports. Furthermore, some of the banks report the data on economic capital on their web page only. Therefore, we had an extensive dataset with approximately 250 documents to be reviewed. Even though we used this extensive approach, we came to conclusion that only 18 banks from our sample report at least some details on their economic capital in at least one of

the monitored years. Furthermore, out of these 18 banks Fortis () ceased to exist and had been acquired by the Belgian government and later sold partially to BNP Paribas and partially integrated into ABN AMRO Group. In addition, some of the banks in the sample started reporting their economic capital only during the covered period such as with LBBW or Dexia. The situation is further complicated by the different fiscal year in the case of Japanese banks Resona and Mizuho (with a year-end as of 31 March). When taking into account all the limitations mentioned above, we have full details on economic capital during the period for 14 banks and partial data on 5 other banks. The rest of the sample does not report details on economic capital at all.

Despite the fact that our sample is relatively small, we are convinced that we were able to find some significant patterns which have occurred during the covered period. Based on the above mentioned approach we then make conclusions about the economic capital management of the sample of top-rated world banks. The aim is to provide a detailed overview of economic capital management of 2008 top-ranked word banks before, during and after the crisis and search for the changes during the period.

B. Micro view on economic capital of global banks

Figure 2 represents economic capital allocation of each bank in comparison to other banks in year 2007 and 2010. First thirteen banks in each graph are those which have reported details on economic capital in all covered years. The remaining banks in each graph are marked with lighter color (Resona, Mizuho and Fortis). These banks reported details on economic capital for less than four covered years. Whereas most of the banks have increased the share of credit risk on total economic capital in years 2008 and 2009, this is not the case of Deutsche Bank (DB). DB's credit risk capital has decreased both in relative and absolute values. At the same time, the total economic capital increased substantially.
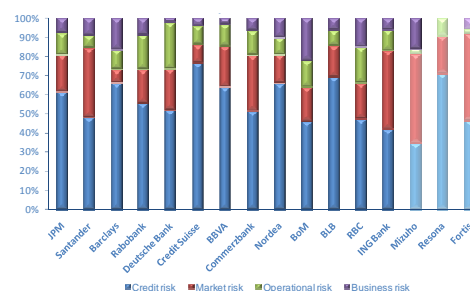

Fig. 2 Economic capital allocation of TOP banks in 2007
Source: Authors

We also have to take into account that each bank assesses the economic capital in a slightly different way and under different criteria. Some banks such as Resona or Dexia do not consider business risk. Some banks, on the other hand, report more categories of risk capital and we had to rearrange them in order to make the categories comparable among individual banks. All in all, credit was the main part of economic capital of the researched banks (except for Mizuho, which was significantly exposed to market risk).
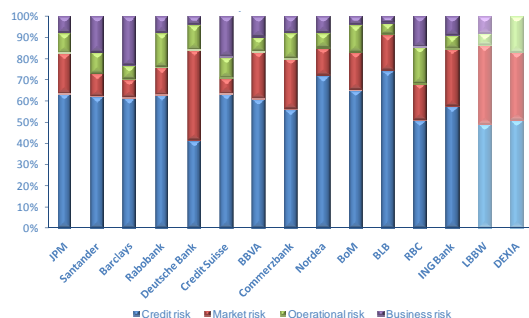
Fig. 3 Economic capital allocation of TOP banks in 2010
Source: Authors

The case of Dexia is interesting from another point of view, because the bank was hit by the financial crisis and had to be bailed out by the governments of Belgium, France and Luxembourg in last quarter of 2008. Since 2009 the bank has started reporting details on economic capital. Before that the date the bank reported only the value of economic capital [16]. Since the bail-out from the state usually requires some reorganisations within the banks administration as well as operation, the situation might have led the bank to examine its risk management procedures and reporting. And, since investors prefer more detailed information, Dexia might have decided to start reporting in more detail in order to regain part of the lost trust of the financial markets. The crisis in this case revealed weakness and probably forced the bank to make some improvements (if not in risk management, then at least in reporting). On the other hand, the case of Fortis bank proves that there is a difference between necessity and sufficiency. Fortis had reported quite openly its economic capital allocation and was still acquired by the state and later sold to its rival BNP Paribas after it had been seriously affected by the financial crisis.

C. Macro view on economic capital of global banks

This part analyses changes in average economic capital allocation of our sample of 13 banks between years 2007 and 2010. We expected a substantial increase in share of credit risk capital on total economic capital during the financial crisis. Figure 4 indicates that a share of credit risk on total economic capital of the observed banks amounted 57.4% followed by market (20.8%), operational (12.8%) and business risk (9.0 %).
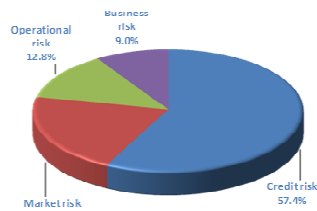

Fig. 4 Economic capital allocation of the researched banks in 2007
Source: Authors

In 2010, the structure of economic capital changed (Figure 5). Whereas share of operational and business risk capital

remained approximately the same, the share of credit risk capital rose from 57.4 % in 2007 to 60.9 % in 2010. The effect of increased share of credit risk capital was then offset by a decrease of market risk share.
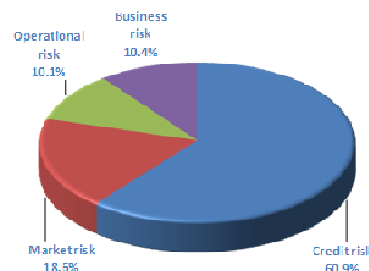

Fig. 5 Economic capital allocation of the researched banks in 2010
Source: Authors

Thus, even though the effect of increased preference of credit risk capital to other types of risks is evident in years 2008 and 2009, it is not as strong as we had expected. We should mention at this stage that we were describing relative values only. The economic capital has risen substantially in absolute terms at almost all banks in all covered years. This is with the exception of, for example, BayernLB, which decreased total economic capital substantially in 2009 compared to the previous year. Moreover, LBBW´s economic capital decreased in both 2009 and 2010. The changes of economic capital values are therefore more significant than the changes of the overall capital allocation. The details on the development in the cases of the individual banks will be further analysed and published an upcoming paper.

IV. CONCLUSION

In this paper, we discussed the economic capital allocation of global banks in 2007-2010. However, as discovered during the global financial crisis (for more details on the pending world global crisis see, for instance, [8], [9], [10], [11], [12], [13], [14] or [17]) , even when economic capital information was publicly disclosed, the underlying assumptions rendered the information useless. Specifically, some global banks that reported relatively high levels of economic capital before the crisis went bankrupt or had to be bailed-out by their government. And, only 15 out of 50 global banks reported their economic capital during the 2007-2010 period. We conclude that relative shares of credit and business risks increased in 2010 compared to 2007, while both operational and market risks decreased their shares on total economic capital of top-rated global banks. However, higher levels of disclosure and transparency of bank operations are required to obtain more confidence from stakeholders. Moreover, further risks such as liquidity risks should be included in these disclosures.

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