



Figure: Bloomberg Screen AllQ SPGB

Managing Risks With The Fairest Value

AEA van der Graaf

Max Planck Sciences Po Center - Chaire PARI

3rd of February 2016

General Introduction

Fair Value Measurements

Financial Risk Management

What do the interactions of the two tell us about risk in the financial market?

Table Of Contents

- 1 Introduction
- 2 Background
 - Sociology and Financial Risk
 - Methodology
- 3 Risk Management in Action
 - Who What Where
 - Usages of Market Concepts
- 4 Fair Value in Bank F
 - Bond Valuations
 - Derivative Valuations
- 5 Insurance Asset Risk Calibration
- 6 Analysis: Market Ideas and Their Boundaries
- 7 Conclusion
- 8 Appendix - Theoretical Background

Why Study Financial Risk as a Sociology?

Financial risk management as a social paradox.

How does one manage risks, control or measure them in a place where it is the shareholder value that needs to be optimised?

or

Why should one manage the risks of a financial market, if you could also *not* take them?

Sociology??

Who of you have rather theoretical, economics or mathematical degrees?

Sociology??

Who of you have rather theoretical, economics or mathematical degrees?

And what did you think when starting to work? Was it the same as you were taught in your degrees?

General Research Design

'Value-Free'

Sociology as a science that is supposed to be 'value free'. No prospective advices but a general interest in what is actually happening. Getting to know more about the social reality, the one represented by the people that are in it.

The Empirics of Financial Risk Management

To get to know 'what is actually happening' in risk management, a close-up of risk managers was necessary. This was operationalised through an immersion in the field. I held interviews with people handling financial risks and by working in two risk management departments, in insurance and in banking.

Description of Fields

Bank F

- European bank in run-off; long-term liquidation
- Market Risk Management department dealt with the 'second' order control of both the balance sheet management risk and market product risks (objects classified in the banking book)

Insurance Company V

- European based global Insurance Company
- Life and Financial risk team (local branch), specifically the modelling of risks related to Solvency II

- 1 Introduction
- 2 Background
 - Sociology and Financial Risk
 - Methodology
- 3 Risk Management in Action**
 - Who What Where
 - Usages of Market Concepts
- 4 Fair Value in Bank F
 - Bond Valuations
 - Derivative Valuations
- 5 Insurance Asset Risk Calibration
- 6 Analysis: Market Ideas and Their Boundaries
- 7 Conclusion
- 8 Appendix - Theoretical Background

Related Actors Risk Department Works With

Bank:

- 'Calculation' Department
- Front Office (incl. Asset and Liquidity Management)
- Accounting

Insurance Company:

- Finance Department
 - People Calculating the Provisions
 - Accounting in General
- People handling insurance and investment products

Financial Risks as Categorisations

What is financial risk? What do the actors say?

- 1** Risk as the categorisation of the different types of risks which are then individually categorised.
- 2** The risk in the market. Including the risks that one does not see coming.

Note the tautological aspect of both definitions.

In practice risk management dealt with the categorised risks like the interest rate risk on a specific derivative or the calibration of longevity risk measures.

The Balance Sheet as Representation of Organisational Health

Risk management does not actively determine the balance sheet. That is the task of the accounting team. However, they work actively with the accounting team and sometimes take over valuation decisions. In Bank F this was the case for bond valuations and in Insurance Company V this was the case for aspects of the provisions' calculations.

Three Different Market Concepts[1]

- 1 The transaction.** A product passes ownership from one person to the other. There is an interaction between the few parties that are linked directly to the product, through ownership rights and transaction exchanges.
- 2 The aggregated transaction data.** The market is represented through a 'curve' or a end-of-day number. These numbers are calculated and made such that they represent the idea of what market data is supposed to look like.
- 3 The recreated market curve.** This data is not based on transactions of the product it represents but is a representation of what the makers of the data think the market is supposed to look like.

Three Different Market Concepts[2]

The three types are used in different instances, whenever they are useful. All however do perform the expectation of a market price.

People had personal preferences of what the right value was supposed to be but when values had to be calculated however the choice of market concept was not based on the 'morals' of the actors but on what the organisation would need as an answer for the valuations.

The Market Concepts and the regulatory rules

IFRS 13 also knows three levels, based on the liquidity of the market. Are the above the same?

The differences (and similarities) between the three IFRS Levels and the market concepts are that Market Concept 2 corresponds to level 1 and possibly 2, whereas Market Concept 3 corresponds to possibly level 2 and level 3.

The regulatory levels however are not part of the risk management discourse when talking about the market. In the determination of models, it are not always the levels that are discussed. The real life market values are not a direct reflection of the regulatory texts.

- 1 Introduction
- 2 Background
 - Sociology and Financial Risk
 - Methodology
- 3 Risk Management in Action
 - Who What Where
 - Usages of Market Concepts
- 4 Fair Value in Bank F**
 - Bond Valuations
 - Derivative Valuations
- 5 Insurance Asset Risk Calibration
- 6 Analysis: Market Ideas and Their Boundaries
- 7 Conclusion
- 8 Appendix - Theoretical Background

Main Products on books of Bank F were bonds and derivatives and both needed a management of the valuations.

The bonds due to their partly illiquid status while the derivatives had problems with the collateral management that was attached to it.

The market risk department of Bank F dealt constantly with market values, within the fair value framework. With the help of models for bonds and derivative valuations they showed what the risks on these assets were and they worked with the valuations such that they would preferably not cause problems for the bank.

The History of Bond Valuations in Bank F

After the 2008 crisis, risk management had tried to save the organisation from having to devalue its bonds so much that it would have [most likely] led to default.

Within level 3, by showing that the bonds were illiquid, they were able to legitimise an internal model of valuations. In an excel file and with the help of ratings, maturity rates and market values that could be associated to the bonds, a model had been made for bond valuations.

After several years, one of the central banks directly involved in the control of Bank F had said; no this is not good enough any more. Bank F did not use enough of the market information available. The regulator had instructed to let go of the model and to use the full market value again.

Fair Value?

The change, incited by the central bank, to fair value had to be made but that led to a problem:

A possible instability of value of bond portfolio. Current situation of capital was good but what if the values would change? Asking shareholders again for capital?

Illiquidity Determination

Financial strategy team and management board: limit a possible the 'walk of shame' to the shareholders and stabilise bond values.

Risk department: carry out the task of value stabilisation.

Through an accounting category change (from AfS to LnR), bonds would not be dependent on the changes in market value. Two limitations existed to the change of categories.

- 1 The new category would mean that the bonds could only be sold on a long-term.
- 2 A change could only happen in case the bonds were categorised as illiquid.

Determining Illiquidity

But: when is a bond illiquid?

*Gerard (Market Risk Team) - Why do they let you do it?
Do we not need to have the maximum amount of bonds
in the new category? Shouldn't the experts do this?*

A bond is illiquid when we can say it is illiquid.

If there are multiple offers to buy and sell but the bid and ask prices have quite a gap, is the bond illiquid? Or, there are some offers to buy but no offer has been executed, is there a market?

Derivative Valuations

The derivatives were part of the investment strategy of the bank and made the bond valuations possible. However, the difficulty with derivatives can be the collateral that needs to be exchanged on a daily basis (cash) and therefore also daily valuations

Meeting on Derivative Models Regarding Collateral

Quarterly meetings on how derivative values related to what the counterparty gave as a value.

Front Office Quants, market data and derivative value calculators and market risk department attended.

With the help of a ratio of the own valuations versus the counterparties' the differences were mapped.

Daily Valuations of Derivatives

Multiple difficult calculation aspects of daily valuations, of which:

1 Creating Market Data

- Volatility Curves need a 'smile'
- Calculating the overnight rate as discount rate

2 Daily Valuations for Collateral Exchange

- The Dispute
- What to do if you are not able to price a derivative?

Above aspects however seen as a given in meeting, discussion was on the change of the models themselves. What is the right market?

Which Market are we talking about?[1]

The discussion on Exchange Rate Swap C was the 'apotheosis' of the meeting.

Derivative quant Janice of RM team: Change the correlation from type-A to type-B and we get much closer to the values of our counterparties.

All other quants at the table (calculation of market data, front office and even from risk management) dismissed this. It seemed that the reasons to dismiss were manifold and relied partially on the personal/organisational preferences (f. ex. Do I really need to calculate this). And for the opposition, correlation A was correct. It was validated and reflected 'The Market'.

Which Market are we talking about?[2]

Howard Risk Management Quant : *But we do not want to just stick to the counterparty.*

Pete, Market Risk Valuation Team Head: *Yes, that is what we want, we want to stick to the counterparty.*

Valery, Head of Market Risk *nods but adds: Well, no, what we want is a price first of all, and secondly that in case the counterparty starts to make trouble, we can actually argue and establish our case. We want to be able to 'deal'. It does not matter if the methodology exactly right in a document, I want the price that is closest to the deal. I want something that I would be able to explain to my clients at the desk.*

- 1 Introduction
- 2 Background
 - Sociology and Financial Risk
 - Methodology
- 3 Risk Management in Action
 - Who What Where
 - Usages of Market Concepts
- 4 Fair Value in Bank F
 - Bond Valuations
 - Derivative Valuations
- 5 Insurance Asset Risk Calibration**
- 6 Analysis: Market Ideas and Their Boundaries
- 7 Conclusion
- 8 Appendix - Theoretical Background

Background

The risk calculations of Solvency II result in a final regulatory capital amount.

At Insurance Company V, multiple calculation steps led to a final simulation of the balance sheet items through which the final regulatory capital would be defined.

The steps were both local and at group level, independently of each other delivering number sets, ending up with a final simulation with the help of polynomials of the balance sheet categories.

What would Mr Market give?

Jane, having worked on the first implementation of stochastic modelling: We made idealtypical calculations to show the answer to the question: What would Mr Market give you?. The insurance calculations approached the one's used in finance. We sold these to the people dealing with provisions and tariff determining, saying it would mean more accuracy.

How would Mr Market give you what? Well, lets make stochastic based risk factor calculations. That way an idealtypical market is calculated, related to the mathematical approaches used in banking.

In the daily work however, the market was not there. Stochastic rates were not calculated by the department and they would just be inputs in the models handled locally.

The Hidden Market

In the work of the risk department, the market was hidden. When working on the financial asset risks as well as on the risks related to the life products, I assumed the asset polynomials as a 'normal' regression-type polynomial calculations, based on real life data points. However, that resulted in abject reactions around the table with people looking at me and shaking their heads.

During the meeting I had scratched the surface and the market came out. The idea of the market became clear, namely one of full information.

Can a polynomial, based on stochastic simulated data points have an over fitting? Is it possible to over fit with the market knowledge of complete information?

The usefulness of the market idea

The market concept of complete information was used in the discussion on what a good polynomial was. The final answer on over fitting did not show the market idea theorisation, in the end an analysis had been done to show that there was no over fitting.

The regulator had asked the question on over fitting and it was up to us to decide how we could respond in such a way that there was no over fitting.

- 1 Introduction
- 2 Background
 - Sociology and Financial Risk
 - Methodology
- 3 Risk Management in Action
 - Who What Where
 - Usages of Market Concepts
- 4 Fair Value in Bank F
 - Bond Valuations
 - Derivative Valuations
- 5 Insurance Asset Risk Calibration
- 6 Analysis: Market Ideas and Their Boundaries**
- 7 Conclusion
- 8 Appendix - Theoretical Background

The Different Markets

Type 1: The Transaction: The 'inability' to value derivatives, therefore taking the day - 1 value of the counterparty. The 'possibility to deal', what can we explain to the counterparty? Each bid and ask quote as shown through the Bloomberg screen.

Type 2: The Aggregated Transactions: Historical correlations in derivative calculations, recreated interest rate curves, the valuation curve represented in Bloomberg

Type 3: The Ideal: The market in the risk calculations in insurance, the model of bond valuations, hypothetical volatilities and correlations

The boundaries of the market concepts[1]

When can which market be used?

Morality: There seems to be a preference by the bank participant that dealt with hypothetical markets for the second type. However, those who (had) worked with the trades themselves, saw the first type as the right one. In insurance risk management, only the third one existed.

The Regulator: If the regulator says you need to change, you change. And you need to be confident to explain your reasoning to the regulator. However, the rules are not the same as the practice. One needs to be right in the representation, there is a lot of space in how to get there.

The boundaries of the market concepts[2]

The right answer: The different market concepts are used to obtain what is requested in a strategic organisational format. You want your model to be accepted, you want to prevent a dispute (or sometimes even create one) or have a bond portfolio that not negatively impacts the capital requirements. You show that you are capable to manage your risks and not have any problems.

Conclusion

Conclusion

The fieldwork brought about three different concepts of market usages in risk management where the usages would lead to responding to a representation of the organisation's health.

There is a multiplicity of market concepts to adhere to the organisational expected representation of health.

Risk management is both responsible when problems are realised as well as for calculating the categorisation of the different types of risks. This leads to their involvement in the balance sheet's representation of health. The value of the market [fair value] comes from three different market ideas which are then used to make sure the expected answer (of the right health) is given within the regulatory boundaries.

Discussion

Can we talk about risk management as a form of control? Either indirect through the representation of risk numbers(f.ex. Solvency II measurements?) or through direct decision making?

Does risk management recreate market ideals of economic theory through their calculations?

- 1 Introduction
- 2 Background
 - Sociology and Financial Risk
 - Methodology
- 3 Risk Management in Action
 - Who What Where
 - Usages of Market Concepts
- 4 Fair Value in Bank F
 - Bond Valuations
 - Derivative Valuations
- 5 Insurance Asset Risk Calibration
- 6 Analysis: Market Ideas and Their Boundaries
- 7 Conclusion
- 8 Appendix - Theoretical Background**

Risk as Control

Power(2008), staying relatively close to Rose and Miller (1990) ideas about accounting and control, describes risk management as a form of internal control, through measurements and risk representations. He sees a growing importance of risk management within the management of the organisation.

Market Values

How can we look at the market and its representations?

Performativity of Markets (Callon 1998, MacKenzie)

- The determination of a market due to economic theory and practices

Different Order Observations (Esposito)

- First order observations as an observation of something outside of the world that you determine
- Second order observation - an observation based on other observations in the same sphere.
 - Esposito: The example of Ratings (in the form of sovereign ratings during the eurocrisis) as second order observations

Second Order Observations

Esposito 2013, p. 6- " [Alleged Fundamentals, first order observations] do not lead the dynamics of operations, which focus instead on seconf-order observation, the mutual observation of others, and this up to very high and seemingly inextricable levels of abstraction and circularity"

Conclusion [Back To The Theory]

The ideas of control by numbers and indirect control through risk management's output are not shown by this research. The market, mainly as a form of second order observation or re-performing market ideas, is used in making sure the organisation's health is guaranteed, not necessarily through its actions but through its representation.

Reference List

Callon, M. (Ed.). (1998). *The laws of the markets (Vol. 6)*. Oxford: Blackwell.

Esposito, E. (2013). The structures of uncertainty: performativity and unpredictability in economic operations. *Economy and Society*, 42(1), 102-129.

MacKenzie, D. (2008). *An engine, not a camera: How financial models shape markets*. Mit Press.

Power, M. (2008). *Organized uncertainty: Designing a world of risk management*. OUP Catalogue.