
The Fundamental Principles of Financial Regulation 1

Brunnermeier et al. (2009)

Introduction

- There is a widespread view that the Credit Crunch of 2007-9 was, in part, a result of insufficient reach of regulation and that a solution is to take existing regulation and spread it more comprehensively across more institutions and jurisdictions
 - That would be an incorrect diagnosis
 - The crisis has involved a regulatory failure as much as anything else
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Introduction

- The current regulatory approach assumes that we can make the system safe by simply trying to make sure that individual banks are safe
 - In practice, it represents a fallacy of composition
 - ***Micro-prudential regulation*** concerns itself with the stability of each individual institution
 - ***Macro-prudential regulation*** concerns itself with the stability of the financial system as a whole
 - The current micro-prudential regulation should be supplemented by macro-prudential regulation
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Who should be regulated (by whom)?

Part 3

Who should be regulated (by whom)?

- Since any effective regulation forces firms to deviate from their preferred option, they always have an incentive to move their business outside the boundary of regulation
 - Commercial banks setting up Special Investment Vehicles and hedge funds in the last credit bubble is a vivid reminder of the “boundary problem”
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Classification of Financial Institutions based on Objective Risk-Spillover Measures

- The classification of financial institutions should be based on objective risk measures that capture the risk-spillovers from one institution to the next
 - Any financial institution that is subject to **systemic risk** (possibility that an event at the company level could trigger severe instability or collapse of entire industry or economy) should be covered by regulation
 - CoVaR seems to be a suitable measure for the classification of financial institutions under regulation
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Classification of Financial Institutions based on Objective Risk-Spillover Measures (cont.)

- **CoVaR** is a technique for capturing a financial institution's contribution to systemic risk based on market data and the value-at-risk (VaR) methodology
 - Bank X's CoVaR is the conditional Value-at-Risk (VaR) of bank X's counterparty or the whole financial sector after conditioning that bank X is in difficulty
 - Systemic Risk is measured by the VaR of the financial system (or a subset of it)
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Classification of Financial Institutions based on Objective Risk-Spillover Measures (cont.)

- ***Value at Risk (VaR)*** is a statistic that measures and quantifies the level of financial risk within a firm, portfolio or position over a specific time frame
 - The q-percent VaR is the “minimum large loss” that occurs only q% of the time, or the loss that is not exceeded (1- q%) of the time
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Classification of Financial Institutions based on Objective Risk-Spillover Measures (cont.)

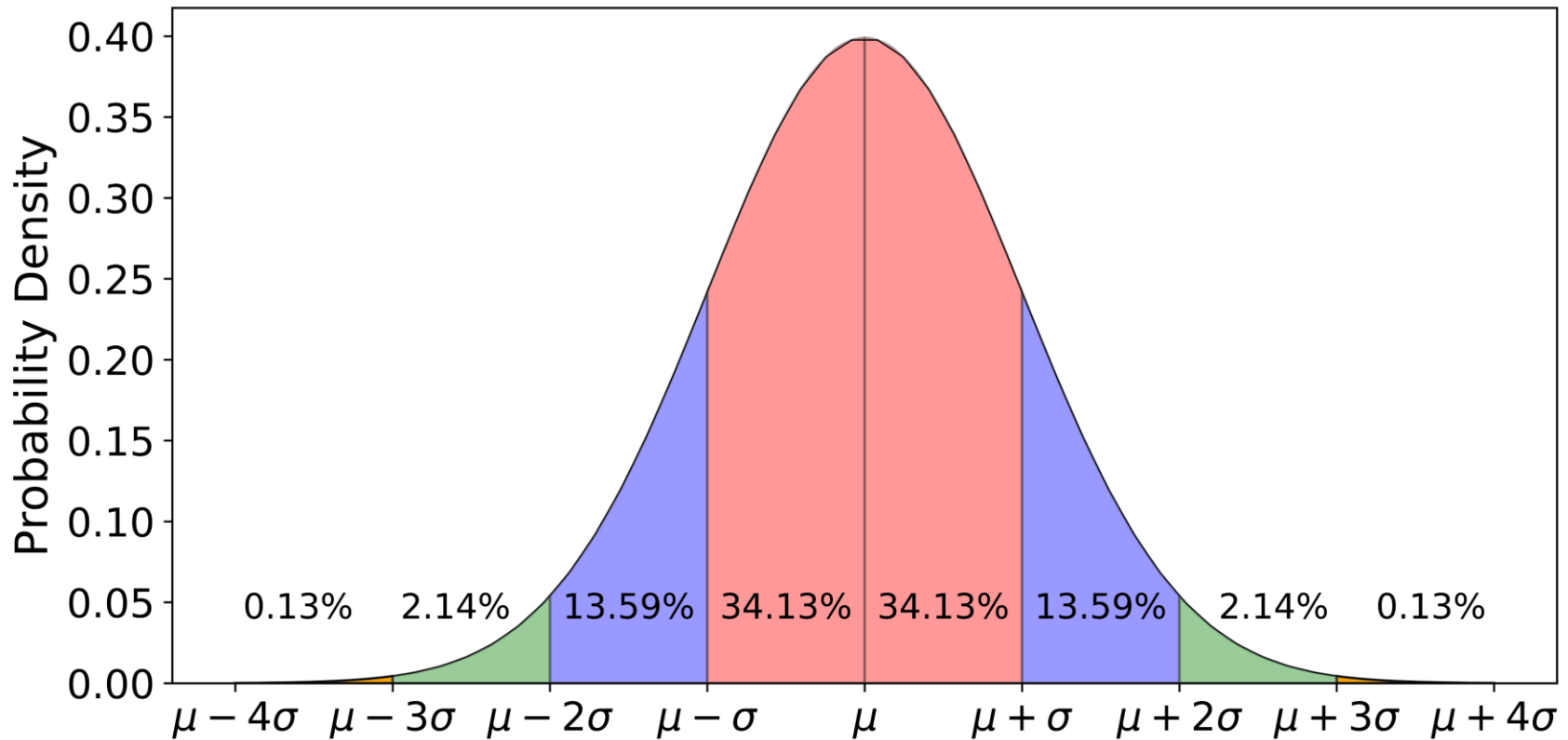
- For some random variable X , we can define the q -percent VaR, denoted VaR_q , as the number that satisfies

$$\Pr (X \leq VaR_q) = q$$

where X can be the institution's market value of assets (MVA) or a function of MVA

Classification of Financial Institutions based on Objective Risk-Spillover Measures (cont.)

Normal Distribution



Classification of Financial Institutions based on Objective Risk-Spillover Measures (cont.)

- Example: What is $VaR_{2.7}$ of MVA of Bank A, assuming that it is normally distributed with mean of \$1 million and s.d. of 0.25 million?
- Note that when MVA falls below the value of liabilities, the institution is insolvent
- Note also that if mean falls or s.d. rises, VaR_q falls. This means during a recession, VaR_q falls and risk rises.

Classification of Financial Institutions based on Objective Risk-Spillover Measures (cont.)

- Let $CoVaR_q^{j|i}$ denote the VaR of institution (or set of institutions) j , conditional on some event occurring to institution i
- The conditioning event is usually chosen to be that institution i is under stress, so that $X^i = VaR_q^i$
- $CoVaR_q^{j|i}$ is a number such that

$$\Pr(X^j \leq CoVaR_q^{j|i} \mid X^i = VaR_q^i) = q$$

Classification of Financial Institutions based on Objective Risk-Spillover Measures (cont.)

- Example: What is Citibank's 5% VaR when JP Morgan Chase is at its 5% VaR?
 - This depends on the level of interconnectivity between Citibank and JP Morgan Chase. If they are highly interconnected, then the CoVaR of Citibank would be small. Risk increases.
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Classification of Financial Institutions based on Objective Risk-Spillover Measures (cont.)

- We need to compare the CoVaR measure to another “reference” measure in order to see the change in the boundary caused by institution i 's financial stress
 - One way to measure the contribution to systemic risk is to show what happens when an institution changes from “normal” to “stressed”, called ΔCoVaR
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Classification of Financial Institutions based on Objective Risk-Spillover Measures (cont.)

- When j is a financial system, ΔCoVaR gives an estimate of institution i 's contribution to systemic risk (how much the system's large loss increases because of firm i 's stress)
 - The risk-spillover of a financial player can be high if
 - (i) it *causes* financial difficulties at other institutions
 - (ii) it is simply *correlated* with financial difficulties amongst other financial institutions
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Classification of Financial Institutions based on Objective Risk-Spillover Measures (cont.)

- Financial institutions can be grouped as:
 - Individually systemic
 - Cause risk spillovers
 - So large and so interconnected (to fail)
 - Macro + Micro prudential regulations
 - Systemic as part of a herd (e.g. highly levered hedge funds)
 - Small, and insignificant, for their individual condition
 - But move together as part of a larger group
 - Some macro-prudential regulation, but limited micro-prudential regulation
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Classification of Financial Institutions based on Objective Risk-Spillover Measures (cont.)

- Financial institutions can be grouped as:
 - Non-systemic large (e.g. insurance companies and pension funds)
 - Not highly levered
 - Full micro prudential regulation, but no macro-prudential regulation
 - Tinies, especially if they are unlevered
 - Small and not interconnected
 - Minimal regulation
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