

Systemic Risk, Systematic Risk, and the Identification of Systemically Important Financial Institutions

The usefulness of systemic risk measures for regulators and policy-makers is determined by three factors: reliability, provision of new information and focus on a clear direction of spillovers from institutions to markets. There are several shortcomings in the performance of two popular systemic risk measures, MES and ΔCoVaR , in regard to these factors. We present an alternative systemic risk measure, the CoSP, which is able to improve the usefulness of measuring systemic risk. Interestingly, CoSP is able to identify systemically important institutions without imposing any assumptions about the drivers of systemic risk or the actual number of systemically important institutions.

Since the 2007–2008 financial crisis, the vulnerability of the global economy to the distress of single banks and other financial institutions has been of special interest to regulators and policymakers. This led to a shift in focus of international regulatory approaches – from microprudential to macroprudential regulation. The first is mainly concerned with the solvency risk of single institutions, resulting from their individual exposures to the underlying market's risk, i.e. systematic risk. In contrast, the contribution of institutions to crises, i.e. systemic risk, is of central concern for macroprudential regulation. Following this shift of focus, a number of banks and insurers were designated as systemically important by the Financial Stability Board (FSB) and the International Association of Insurance Supervisors (IAIS). These Systemically Important Financial Institutions (SIFIs) are subject to closer monitoring and are required to hold additional capital.

Contrary to systematic risk, systemic risk is not concerned with the general co-movement of single institutions' assets with the overall market. Systemic risks arise from spillovers of particularly severe distress events, since these will typically result in systemic consequences. In systemic risk, such spillovers have a clear direction: from institutions to markets. ▶





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The literature has identified various channels that may amplify the transmission of institutions' distress to markets. Examples include interbank lending or CDS trading (see Benoit et al. (2016) for an overview). With these specific channels in mind, the FSB and IAIS base their identification of SIFIs on institution-specific indicators that may contribute to systemic risk. Key indicators include size, interconnectedness and substitutability (see Basel Committee on Banking Supervision (2013) and International Association of Insurance Supervisors (2016)).

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However, in response to the FSB and IAIS methodology, several authors have been stressing the substantial differences in the business models of different institutions, particularly between banks and insurers (see Thimann (2014)), and the resulting potential differences in the interpretation of the FSB and IAIS indicators for systemic risk. While the IAIS reacted by adjusting the weights of the indicators for insurers, the key indicators themselves are still very similar to those used for banks.

Measuring Systemic Risk

Clearly, there is a strong need for systemic risk measures that do not ex ante depend on a specific relationship between business activities and systemic risk, but may be used ex post to identify this relationship. Academics have been developing various cross-sectional systemic risk measures that aim at directly measuring an institution's contribution to systemic risk. The Marginal Expected Shortfall (MES) and Systemic Expected Shortfall (SES) by Acharya et al. (2016) and the ΔCoVaR by Adrian and Brunnermeier (2016) are among the most popular of these cross-sectional systemic risk measures. The SRISK by Brownlees and Engle (2016) and dependence-consistent ΔCoVaR by Mainik and Schaanning (2014) are based on them.

Regulators and policy-makers endeavor to monitor the systemic risk contribution of single institutions and draw conclusions about the drivers of systemic risk. For these applications, cross-sectional systemic risk measures prove useful only in case they 1) are reliable, 2) provide new information and 3) are based on a clear direction of spillovers from an institution to a market. This implies, in particular, that regulators should be able to distinguish between systemic risk and systematic risk very clearly.

However, the large unreliability of ΔCoVaR (see Danielsson et al. (2016)), indicates that this measure (and measures

that are based on it) might violate the first condition of being useful for regulators. Moreover, by assuming that systemic risk materializes instantaneously, MES and ΔCoVaR exhibit a strong interconnection with systematic risk (see Benoit et al. (2016)). Indeed, we find 96% correlation between MES and systematic risk, as given by the beta factor, and 51% correlation between the dependence-consistent ΔCoVaR and systematic risk. Thus, it seems disputable that these measures fulfill the second condition of being fully useful for regulators. Eventually, the un-

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derlying assumption that systemic risk materializes instantaneously makes it difficult to establish a clear direction of spillovers, as required by the third condition.

Timing and Persistence of Systemic Risk

In contrast to the reasoning of MES and ΔCoVaR , numerous crises have demonstrated that distress events do not necessarily materialize instantaneously. Instead, they may cause persistent market distress, which in turn may lead to an impairment of the financial sector with possible severe ►

consequences for the real industry. To capture this persistence, in Kubitzka and Gründl (2016) we consider an institution as significantly systemically important (s.s.i.) if its distress has a significant and persistent negative impact on a market. This classification is an alternative to the FSB and IAIS methodology, since our results are solely driven by the actual risk of spillovers of shocks from an institution to a market, i.e. an institution's contribution to systemic risk.

Distress events may cause persistent market distress and lead to impairment of the financial sector.

To measure the magnitude and duration of systemic risk, we propose to employ the Average Excess CoSP and Spillover Duration. Both measures display a much smaller correlation with systematic risk (26% and -4%, respectively) than MES and the dependence-consistent ΔCoVaR , and are thus better able to distinguish between systemic and systematic risk. By focusing on the persistence of spillovers, we strengthen the attention to a clear direction of spillovers. This provides an advantage with regard to the second and third condition of being

useful for regulators. The Average Excess CoSP and Spillover Duration are based on the CoSP, which reflects the likelihood of a systemic market event subsequent to a financially adverse shock of an institution. While in its underlying structure CoSP is very similar to the dependence-consistent ΔCoVaR , it is substantially more reliable. Thus, we yield an improvement with regard to the first condition outlined above.

Size and Sector-Specific Systemic Risk

We detect significant spillovers of shocks from institutions to markets at various time horizons. During crises, this persistence is particularly large (up to 80 days), while it is substantially smaller in non-crisis times. Our analysis shows that market capitalization, the type of market and the type of institution significantly drive systemic risk.

A larger market capitalization relates to an increasing likelihood that an institution is significantly systemically important (s.s.i.) and imposes a higher level of systemic risk, measured by the Average Excess CoSP. Also, the average duration of the impact of spillovers, as given by the Spillover Duration, is longer for institutions with a larger market capitalization. Since market capitalization is an indicator for the size of an institution, this result is in line with the indicator-based methodology of the Basel Committee on Banking Supervision (2013) and International Association of Insurance Supervisors (2016).

The CoSP-based measures reveal significant differences between different types of institutions. Our empirical results suggest that brokers trigger the highest and most persistent level of systemic risk, followed by real estate firms, commercial banks and insurers.¹ Insurance carriers trigger the least persistent level of systemic risk in comparison to other financial institutions. In contrast, they are exposed to the most persistent systemic risk from other institutions. The systemic riskiness of non-financial companies has also been causing serious

Insurance carriers trigger the least persistent level of systemic risk.

debates: Other systemic risk measures indicate that non-financial companies trigger the highest level of systemic risk, which seems to go against economic intuition (see Guntay and Kupiec (2014)). While our analysis confirms this result for the dependence-consistent ΔCoVaR , the CoSP-based measures signal that non-financial companies trigger the smallest systemic risk. This result is very robust and seems to be more in line with economic intuition. ▶

Finally, different markets also exhibit a significantly different vulnerability to systemic risk. While the exposure to systemic risk is the smallest for the brokerage market, insurance companies are most vulnerable to large and persistent systemic risk. Thus, insurers pose a smaller systemic risk to other financial institutions than they are exposed to.

Concluding Remarks

The new CoSP-based systemic risk measures proposed by Kubitzka and Gründl (2016) improve the measurement and perception of systemic risk in various ways. Firstly, they exhibit a larger reliability and distinguish systemic risk from systematic risk more clearly than other common systemic risk measures. Secondly, they reflect the persistence of systemic shocks we have observed in various crises. Thirdly, the ranking of institutions according to systemic risk implied by CoSP-based measures is very robust and more in line with economic intuition than that of other measures.

As many other systemic risk measures, CoSP is based on historical stock returns. Thus, it is not able to forecast a crisis as long as market participants do not foresee this crisis. However, particularly the spillover duration is able to partly detect an increased persistence of shocks before a crisis occurs. Also, CoSP-based systemic risk measures may be used to identify differences in the systemic risk contribution of different institutions,

vulnerability of markets and drivers of systemic risk. They are thereby able to motivate and substantiate indicator-based models of systemic risk and to reveal channels that support the propagation of systemic risk. Eventually, our findings may lay the foundation for a more target-oriented and refined identification and regulation of systemically important institutions. ♦

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