The Systemic Risk of Risk Capital (Or the "No matter what" premise)

by Charalampos Fytros and Ioannis Chatzivasiloglou

When regulators examine financial institutions, one of the most important areas on which they focus is capital requirements.

It has become almost common sense that the more resilient you want to have a financial system, the higher the capital requirements of the financial institutions should be set. It has also become common sense that capital requirements should not be set "just higher," but they should be closely related to the risk each institution has assumed. The link between the level of risk and the capital requirements is achieved via the determination of three parameters: the risk measure, the time horizon and the confidence level.

The choice of a specific risk measure (e.g. VaR, TVaR etc) should take into account issues such as the stability of the computations, its ability to easily and sensibly aggregate and decompose the risk, the level of understanding by senior management of the financial institutions. The time horizon reflects issues such as the liquidity characteristics of the assets and liabilities, the holding period of the risk, the type of the risk, the risk management needs. Finally, the confidence level determines the probability of the capital to be adequate. For example, if a financial institution is setting its capital requirements as "99.5 percent VaR over one year," this means that it should hold capital so as the actual losses it may suffer over a one-year period are expected to be lower than its capital amount with a probability of 99.5 percent. Or in reverse, it means it should hold capital so as the actual losses it may suffer over a one-year period are expected to be higher than its capital amount with a probability of 0.5 percent. But if actual losses exceed the available capital, the financial institution will not be able to honor the excess obligations, so it is considered to have defaulted.

As it can be seen, the confidence level a specific financial institution is using for its risk capital calculations is closely linked with its desired probability of default. And, in effect, when a confidence level is determined by regulators for a financial system in total, the probability of default of the system has also been determined. If we want to gain insight of the implications from the choice by regulators of the confidence level, we should focus more on the "probability of default" notion. Setting the confidence level, for example, at 99.5 percent means that regulators would wish that, no matter what, the probability of default of each financial institution should be 0.5 percent. What is important to note is the "no matter what" premise, which is often concealed, not mentioned or in most cases forgotten at all.

Let's examine the "no matter what" premise so as to better understand possible implications:

When we want a specific financial institution to hold risk capital so as to maintain a specific probability of default, all we ask to have is this specific probability of default in all cases over each time period. That is, we demand to hold risk capital corresponding to the same probability of default in calm times and in turbulent times, in times characterized by stability and in times of crises, in times with low volatility and in times with high volatility. That is, regulators have fixed the required probability of default regardless of the position on the economic cycle the economy is found to be—no matter what.

The burden of such requirement (i.e. no matter what) is significant but manageable, as long as the financial institution is able either to rise as much capital it wants or to diversify and mitigate the risk it has assumed, so that at the end, is

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able to match the available capital with the required capital. But problems seem to arise when capital becomes a scarce resource, diversification opportunities are limited and risk mitigation cannot be effectively achieved. When does that happen? During turbulent times, or when the circle hits its lower parts. A fixed regulated minimum probability of default (say, 0.5%) requires then, that financial institutions absorb liquidity, exhaust scarce diversification opportunities and shed their risks, consistent with a risk-mitigation strategy. That is, it requires financial institutions to adapt a strategy that positively contributes to the overall turbulence – in effect, boosting cyclicality. What is even more interesting, is that the more regulators push the probability of default towards nil (that is the higher the confidence level is put), the more responsive and cyclical-contributor does the financial institution become: a unit of increase in the overall systemic volatility drives financial institutions, already regulated to work deep in the tail (i.e. already required to always maintain a fixed and low probability of default), to upload numerous (that is, more than one) units of their risks to the overall system. And even if they finally make it, you end up with a "healthy" financial system and no real economy.

We are used to believe that we can assess systemic risk by properly aggregating two systemic components: the regulated minimum probability of default of financial institutions (1st systemic component) and their mutual correlation (2nd systemic component).

Yet, we are not used to recognize the following trade off:

(a) Should you regulate for a low default probability, lower than a critical probability L, you can bring individual default probability (1st systemic component)

down, but don't be sure at all that mutual correlation (2nd systemic component) will decrease or even stay the same. By bringing the default probability down, you actually stress and narrow down financial institutions' strategic options: in fact, you coordinate responses. That is, mutual correlation is going up.

(b) Should you loosen default probability, higher than a critical probability U, mutual correlation is expected to fall back. But you can't soften your requirements for long – a high probability of default means exactly that: many financial institutions will eventually go down.

And so, here is what we get:

In case of regulating for a low default probability (lower than L), a marginal decrease of default probability leads to a higher marginal increase of mutual correlation – net effect being the increase of systemic risk.

In case of regulating for a high default probability (higher than U), a marginal increase of default probability leads to a lower marginal decrease of mutual correlation – net effect being, again, the increase of systemic risk.

We name the space between L and U, "window for business". That is, we can't push for neither too high nor too low default probabilities. Regulate too high and you introduce rigidity to the system: you choke the economy. Regulate too low and you introduce softness in your foundations: they cannot for long sustain the economy.

And so, what's the conclusion? The crisis taught us that our individualized model, our "institution by institution"

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model of supervision, is not enough. We learned that an LU window for business should be sought. Thus, systemic risk should be overseen. And so, we created a watchdog. Is that all? No. A question remains: why such a window exists in the first place?

The answer is, because mutual correlation (that is, correlation between institutions) is not stable – it changes too as a function of the regulated minimum default probability generating opposite systemic effects. And that creates a net effect, a functionality which is specified by the relevant incremental moves of both the 1st and 2nd systemic components, as described above. But why does that happen? Because the actual flow of risk does not follow a down-up direction – it follows a top-down one. That is, *systemic risk conditions are the ones that provide a basis for meaningful changes in both of our systemic components*. Systemic risk is not the net effect of such incremental changes: instead, such incremental changes are the *net effect of systemic risk conditions*. Which means, systemic risk can only be the condition for regulating individual financial institutions – not the other way around. We cannot anymore ignore that a fixed, "no matter what", systemic-free probability of default does only but produce cyclical instability right when you don't need one: when liquidity dries out, financial institutions are

asked to absorb and retain as much of it as possible; where risk has already been spread all over, financial institutions are asked to dump their own as fast as possible.

Instead, financial institutions should be asked to follow a flexible, systemic-dependent probability of default, within a window for business. Financial institutions should strive to behave as automatic stabilizers within a systemic-dependent confidence level – not systemic-free. Rigidity should be sought for the confidence level; softness for the systemic-dependent approach. Under such a policy mix, both the overall oscillation limits itself, and the institution is given a leeway to breathe.

Can such systemic-dependent regulation result in contractionary effects during good times? Perhaps. But this eventually depends on the mix of our regulations, which again, should be systemic-dependent: supporting for example capital increases instead of asset shrinking, wanes the appearance of such side effects. Which means, no room for "no matter what" premises exist, as long as meaningful institutional supervision can only be derived on the basis of a systemic background reality.

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