

Towards a Reinvigoration of the Risk Management Framework for the Scope of Upgrading Prudential Surveillance

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ABSTRACT

This article discusses financial stability related notions of risk, the issue of convergence and cross financial sector prudential intervention. It elucidates the Basel framework shortcomings and enunciates the requirement of setting a reinvigorated prudential framework before proceeding to its essentials in terms of engineering. It highlights an early warning approach dealing with the issue of time reaction mismatch of the prudential authority and the priority of setting a long run forward guided approach. The objective of this research is to provide a clue into enhancing prudential setting of instruments, the forwarded guided purview of surveillance as well as hedging and the Balanced Score Card.

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Introduction

The Basel framework in all its versions tried to tackle the issue of prudential surveillance and to find a way out of systemic exposure for the credit market. It is accountable for many improvements in terms of resilience from risk root items and the outburst of financial meltdowns but still remains with many shortcomings that have to be annihilated in order to ascertain complete resilience. One first step to achieve this goal is to criticize accurately the Basel framework and show explicitly its shortcomings for the sake of finding an end to them. While ascertaining to accomplish this endeavoring task we find theoretical evidence of a prominent role played by items exerting cross effects among financial sectors such as Risk moments Risk dispersion over time, and henceforth early warning systems, the issues of NPLs, Borrowers creditworthiness, Information asymmetries and so on. This been said as long as stock market sector stability matters a lot for overall financial stability; it still stands that the issue of hedging raises a debate of having to face complicated ordeals having cross effects that reveal controversial as their implications require choice of priorities in situations where accomplishment of all alternatives is a must to ensure adequate resilience from risk hindrances root causes, the onslaught of financial meltdowns and improved performance of the financial sectors simultaneously whenever the situation of one is compromising for the situation of the other as is clearly obvious. In this chapter we raise numerous issues related to financial instability mitigation prerequisites and try to provide adequate answers to them.

Is the Basel IV framework based on sensitivity analyses a good fit for an upgrading of conventional prudential surveillance? What instruments grasp most the basics of threats accompanying uncertainty, excessive fluctuations of equity prices and systemic market risk? Is a new structural expression of Risk needed to better grasp its key features and afford its supervision and does it sketch to finance theory implications as to principles of dispersion? How do main features characterizing the credit sector such as information asymmetries Non performing loans and borrowers' credit worthiness affect share prices volatility thereby exacerbating financial stability and the propagation of risk root items across financial sectors? Is there a need for adopting long run prudential surveillance grasped by what we would call early warning? What are the prerequisites for ensuring a best forecasting of long run relationships or jump effects in terms of prudentiality? What specific role is played by hedging in terms of prudentiality for both the credit sector and the stock market sector? The conventional macro prudential framework of surveillance assumes implicitly that is sufficient to promote

financial stability for the overall financial system and mitigate related financial vulnerabilities and risk. These assertions should be subjected to strong criticism as stock market risk stands for a financial instability driver as much as the credit market. Besides what complicates further the endeavor of ensuring awareness and resilience of the banking system is that it is not sufficient to make other financial sectors fit the financial instability mitigation prerequisites and that indeed the various financial sectors interact with each other with many respects. Here the issues of non performing loans information asymmetries and borrowers credit worthiness along with hedging further complicate the analysis and generates externalities or side effects that might reveal being problematic in that they raise a controversial interrogation on the stake of efficiency and stability in ensuring complete resilience and accurate performance of both financial sectors. The perspective of risk mitigation should encompass risk mitigation of economic projects. Alongside risk mitigation of risk coming from liquidity and credit risk from the banking perspective and excess volatility and hedging deteriorating consequences coming from trading of securities, it is clear that a perspective directed towards economic and business projects where project risk is divided into equity relative risk and external borrowing relative risk grasps the credit risk pertaining to the banking sector and one part of volatility in the share prices coming from disformativeness with respect to share prices and profitability outcomes pertaining to the stock market sector. In this respect the dispersion of risk measured by its variance, the moments which are skew and kurtosis of risk matter far more than barely limiting prudential intervention to banking and stock market supervision. There should be room to target framing variance of risk in such a way that makes early warning easier for clear-sightedness of future hindrances to systemic risk mitigation. Furthermore, as credit and liquidity risks are generally subjected to jump effects that herald unexpectedly, it is obviously of commensurate importance to go deep inside the likelihood of having regime switching models that describe at best over the long run the behavior of items related to systemic exposure such as credit risk or liquidity risk or illiquidity risk. Besides information asymmetries and inefficiency result in generation of risks as they are structural market imperfections that exacerbate the prevalence of conjectural hindrances such as credit risk and excess volatility of share prices in the credit market and stock market respectively. In the following, we will deal with each issue separately with full consideration of their interlink ages and implications on each other.

A New Composition of Risk and A Binding Condition for Risk Distribution in Compliance with Finance Theory

Composition of Risk

In the literature on Risk and credit risk, the usually adopted Risk composition is about idiosyncratic risk and systemic risk.

We assume with reference to Frei (2017), that Risk comprises three main components.

- The point in time component which involves subjection to cyclical and autocorrelation.
- The stable component or through the cycle component which involves innovation due to industrial specificities.
- The uncertainty component which is exclusively tributary to uncertainty and is neither subject to cyclical nor to industry specificities and is distinguished by asymptotic un-correlation and asymptotic neglectability of innovations.

This composition displays the feature of disentangling the aspects depictable through prudential restrictions from those subjectable to probabilistic assessments and those retraceable with business cycle related analyses, As a matter of fact uncertainty should be subjected to probabilistic assessments whereas through the cycle aspects should be targeted through prudential restrictions and point in time risk can be traced back by comparing its pattern to that of OG within the framework of business cycle analyses.

Risk mitigation involves being cautious about financial stability which grasps its main drawbacks on the financial system. Risk implies financial vulnerability and instability and is assumed to harm the entire financial system in such a way it might trigger a financial meltdown whenever excessive.

Uncertainty and the search for yield generate risk that is mainly harmful for the banking and the stock market sector although it might be beneficial as long as it is bound to profitability. This issue has been dealt with within the framework of the Basel frameworks and stock market prudential regulation as documented in Basel II through IV. But a lot has still to be achieved and reinvigorated under the scope of these purviews to afford better resilience from Risk and its implications. Hedging from risk in the financial system cannot be ascertained because Hedging in the stock market is compromisingly involving the credit sector in excess risk and Hedging in the credit market which is claimed to be deployed through implementation of prudential restrictions as it amplifies excess volatility of share prices.

Risk Moments and Prudential Surveillance

Among the main shortcomings of the Basel frameworks stands the fact that its scope is to mitigate risk disrespectfully of its composition in structure but taking into account solely its nature either liquidity risk or credit risk or capital non adequacy. But there should be room for consideration of moments of risk under the scope of risk supervision either ex-post for static risk assessment or ex-ante for early warning forecasting as risk is a random variable and the more it is dispersed in probability of occurrence the more it is unpredictable hence not subject to accurate framing and not accounted for in a precise way. Thus a more appropriate goal for prudential surveillance should be risk moments framing and restrictions alongside mitigation of expectation of risk. The perspective of risk mitigation should encompass risk mitigation of economic projects.

Alongside risk mitigation of risk coming from liquidity and credit risk from the banking perspective and excess volatility and hedging deteriorating consequences coming from trading of securities, it is clear that a perspective directed towards economic and business projects where project risk is divided into equity relative risk and external borrowing relative risk grasps the credit risk pertaining to the banking sector and one part of volatility in the share prices coming from disformativeness with respect to share prices and profitability outcomes pertaining to the stock market sector.

In this respect, the moments of risk matter far more than its expectation provided risk is taken for a random variable. There should be room to target a concise framing of risk moments for forecasting purposes as a prudential surveillance approach aiming at mitigating financial instability and vulnerability in a more concise way rather than solely mitigating risk. Risk scoring should be proceeded to in function of all Risk moments, Mean, variance, skew and Kurtosis together with higher moments VAR value at risk and CVAR conditional value at risk and not only expectation and overall probability of occurrence.

It should be dynamic or time dependent in that it encompasses future Risk prospects ex-ante in function of early warning modeling. If not Risk restriction lacks accuracy and precision. Hence prudential surveillance should focus on all Risk moments rather than barely Risk expectation. This should be conducted disrespectfully of the fact that risk moments are endogenous in nature and that they are pertaining to projects being financed for the banking sector and equities being listed in the stock market sector. In this respect, prudential surveillance has got the tools to restrict the banking and stock market intermediation but cannot restrict the risk tails and moments that are tributary to projects and equities independent from the service being provided by a bank or a stock market trading.

Prudential surveillance can mitigate risk assuming it displays features controlling its determinants. It is easily proven that prudential surveillance can control contagion liquidity risk credit risk capital adequacy and excess volatility of stock markets. But is it likely to affect the risk distribution and its moments? Can it affect the risk skew and Kurtosis and higher moments like Value at risk and conditional Value at risk?

It is consented that Variance Skew and Kurtosis are endogenous to risk tails. Papers referring to the four moments optimization for risk return optimization which are Mean or expectation, Variance Skew and Kurtosis are like Harvey (2003), Kenalbay Ozut and Franko (2011), Beardsley Field and Xiao (2012), Saranya and Prasanna (2014), and Harvey Liechty, Liechty and Muller (2013). As far as prudential surveillance is concerned and due to the fact that risk moments are endogenous to risk and cannot be restricted by a financial intermediary, we state that the BSC, the auditing techniques and technical advising can help affect risk tails commensurately.

A comprehensive methodology of intervention proceeded by central banking and industry authorities can help limit and mitigate risk tails commensurately by reversing abnormal patterns by key entrepreneurial intervenient that might exhibit abnormal investment decision that translate into more imprudent risk tails in vertical integration through contagion. In industries correlated vertically the risk incurred by the supplier is incurred by the retailer with an add up and propagation of risk biased by correlated patterns of skew and kurtosis.

Through the adequate fine tuning of the Balanced Score Cards and advising centralized at the relevant authorities of industry and Central Banking, there is room for containing abnormal behavior of risk tails that might exacerbate systemic exposure through adjustment of cross correlation among vertically linked industrial and commercial activities as well as uncertainty related to risk variance and its moments; skew and Kurtosis. This can be adopted through benchmarking of similarity with observed risks dispersion from historical Balanced Score cards of enterprises as well as available performance of credit worthiness and risk scoring from the banking system and some past observations of share price evolutions and adjustments of accounting performance of listed enterprises to their market performance that are assumed to allow to go deeper into details and specificities of past risk tails.

A Mathematical Proof of The Prevailance of a Polynomial Structure of Variance of Risk Under Dynamic Distribution and Uncertainty

Sheng and Yao (2014) stated about chance theory that: "Uncertainty and randomness are two basic types of indeterminacy. Chance theory was founded for modeling complex systems with not only uncertainty but also randomness. There are some important characteristics about uncertain random variables; the expected value is the average value of uncertain random variable in the sense of chance measures and represents the size of uncertain random variable. The variance is computed through chance distribution and inverse chance distribution" Thus, the expectation of uncertain random variable is the mean of values of the uncertain variable or its computed value.

We assume in the following that $E(\text{uncertainty of } R)$ can be taken for the dispersion of R or $V(R)$ for simplification purposes. If we assume that the expectation of Risk uncertainty is the variance of risk, We find that the expression of the variance of risk is a polynomial of the expectation of risk with coefficients as functions of the parameters α and μ assumed since the definition of the structuring of risk. This dynamic formulation is very common in Economics literature and is intended in finance to express dynamic financial phenomena.

In the financial economics literature, there is a consensus that there exists a positive relation between risk and return. Nevertheless, the empirical findings so far have been contradictory. These contradictions are the result of negative skew in the distribution of portfolio excess return and the fact that the estimation of intertemporal asset prices models are based on symmetric log likelihood specificities.

We begin with the basic definition of variance of risk assuming risk is a random variable.

$$\text{Var}(r) = \text{Exp}((r)^2) - (\text{Exp}(r))^2$$

And an extrapolation from the definition of Profitability Gap

$$\begin{aligned} \text{Profitability Gap} &= \text{Potential profitability} - \text{Actual profitability} \\ &= (\text{Effectively likely risk}) * (\text{Measure of risk}) \end{aligned}$$

Assuming potential profitability is the remuneration of overall risk effectively likely risk is equal to (Risk – uncertainty).

As long as:

Risk = uncertainty + effectively likely risk (like in section 2)

Now the measure of risk is:

The cumulation of risk pertaining to credit activity, risk pertaining to excess volatility of stock markets and projects risk which is profitability gap. Assuming μ is the risk return tradeoff coefficient which is not necessarily scalar

This leads to Profitability gap= (Risk- Uncertainty) * ((Risk premiums-Risk of NPLs)+(Stock market index-principal component of SMI)+ μ Profitability gap)

Risk = Porf gap *(1/((Risk premiums-Risk of NPLs) + (Stock market index-principal component of SMI) + μ Prof gap)) + Risk Uncertainty

The expectation of profitability gap is a certain scalar α multiplied by the expectation of risk

The expectation of the multiplier for prof gap is $1/(1+\alpha*\mu*Exp(Risk))$

$Exp(R) = Var(R) + \alpha*Exp(R)/(1+\alpha*\mu*Exp(R))$

$Var(R) = E(R) - \alpha*E(R)/(1+\alpha*\mu*E(R))$ (0)

$Var(R) = E(R)^2 - (E(R))^2$ (1)

$E(R)^2 = Var(R) + (E(R))^2$

$= Var(R) + (Var(R) + \alpha E(R)/(1+\alpha\mu E(R)))^2$

$= Var(R) (1 + Var(R) + 2 \alpha E(R)/(1+\alpha\mu E(R)) + \alpha^2 E^2(R)/(1+\alpha\mu E(R))^2$

Substituting into (1) gives

$Var(R) = Var(R) (1 + Var(R) + 2 \alpha E(R)/(1+\alpha\mu E(R)) + \alpha^2 E^2(R)/(1+\alpha\mu E(R))^2 - E^2(R)$

$= Var(R) (1 + Var(R) + 2 \alpha E(R)/(1+\alpha\mu E(R)) + \alpha^2 - 1 - \alpha^2 \mu^2 E^2(R) - 2 \alpha \mu E(R)/(1 + \alpha^2 \mu^2 E^2(R) + \alpha \mu E(R)))$

Setting expressions of Var(R) on the left handside yields

$Var(R)* (1 - 1 - Var(R) - 2\alpha E(R)/(1+\alpha\mu E(R))) = E^2(R)* (\alpha^2 - 1 - \alpha^2 \mu^2 E^2(R) - 2\alpha \mu E(R)/(1 + \alpha^2 \mu^2 E^2(R) + \alpha \mu E(R))$

Thus $-Var^2(R) = 2 Var(R) \alpha E(R)/(1+\alpha\mu E(R)) + E^2(R)* (\alpha^2 - 1 - \alpha^2 \mu^2 E^2(R) - 2\alpha \mu E(R)/(1 + \alpha^2 \mu^2 E^2(R) + \alpha \mu E(R))$

Therefore

$Var(R) = -2 \alpha E(R)/(1+\alpha\mu E(R)) - E^2(R)/Var(R)* (\alpha^2 - 1 - \alpha^2 \mu^2 E^2(R) - 2\alpha \mu E(R)/(1 + \alpha^2 \mu^2 E^2(R) + \alpha \mu E(R))$

$Var(R) = E(R) - \alpha E(R)/(1+\alpha\mu E(R)) = E(R)(1 - \alpha/(1+\alpha\mu E(R)))$

The second expression leads to

$E(R)(1 - \alpha/(1+\alpha\mu E(R))) + 2 \alpha E(R)/(1+\alpha\mu E(R)) = -E^2(R)/Var(R)* (\alpha^2 - 1 - \alpha^2 \mu^2 E^2(R) - 2\alpha \mu E(R)/(1 + \alpha^2 \mu^2 E^2(R) + \alpha \mu E(R))$

Therefore

$E(R) (1 + \alpha/(1+\alpha\mu E(R))) = - (E^2(R)/(E(R)(1 - \alpha/(1+\alpha\mu E(R)))) * (\alpha^2 - 1 - \alpha^2 \mu^2 E^2(R) - 2\alpha \mu E(R))/(1 + \alpha^2 \mu^2 E^2(R) + \alpha \mu E(R))$

Simplifying both sides by E(R) leads to

$1 + \alpha/(1+\alpha\mu E(R)) = (1/(1 - \alpha/(1+\alpha\mu E(R)))) * (\alpha^2 - 1 - \alpha^2 \mu^2 E^2(R) - 2\alpha \mu E(R))/(1 + \alpha^2 \mu^2 E^2(R) + \alpha \mu E(R))$

Now we make use of the notion of implicit differentiation with respect to E(R) both sides

The first term in the right hand side is denoted by f and the second term by g

The development of the implicit differentiation leads to

$-\alpha 2\mu/(1+\alpha\mu E(R))^2 = f'g - fg'$ with respect to E(R)

Which yields

$-\alpha^2 \mu/(1+\alpha\mu E(R))^2 = (1/Var^2(R))* (2 \alpha^2 \mu^2 E(R) + 2\alpha\mu(1 + \alpha\mu E(R) - \alpha) (1 + \alpha^2 \mu^2 E^2(R) + 2 \alpha \mu E(R)) - (1 - \alpha + \alpha^2 \mu^2 E^2(R) + 2 \alpha \mu E(R))((\alpha^2 \mu + \alpha \mu E(R) + (1 + \alpha\mu E(R) - \alpha)(2 \alpha^2 \mu^2 E^2(R) + \alpha \mu)))/(1 + \alpha\mu E(R))$

with introducing equation (0), $Var(R) = E(R) - E(R)/(1+\alpha\mu E(R))$ to the right hand side and substituting by Var(R)

We take $Var^2(R)$ to the numerator of the left handside and we develop the right hand side for E(R) then we replace Var(R) by y and E(R) by x

We find

$Y^2 = 1/(\alpha^2 \mu x)* (x^4(2 \alpha^5 \mu^5 + 2 \alpha^4 \mu^4 - 2 \alpha^4 \mu^4(2 - \alpha)) + x^3(2 \alpha^4 \mu^4(1 - \alpha\mu) - 2 \alpha^4 \mu^4 + 2 \alpha^3 \mu^3) + x^2(2 \alpha^3 \mu^3(1 - \alpha\mu) - 2 \alpha^3 \mu^3 - 2 \alpha^3 \mu^3(2 - \alpha) - 2 \alpha^2 \mu^3(\alpha^2 - \alpha) + \alpha^2 \mu^2(1 + 2\alpha\mu)) + x(-4 \alpha \mu^2(\alpha^2 - \alpha) + \alpha \mu(1 + 2 \alpha\mu)) + 2 \alpha \mu(1 - \alpha) - 2 \mu(\alpha^2 - \alpha)$.

By using implicit differentiation once again with respect to x we find

$d(y^2/dx) = 2 d(y/x) y$

$d(y/x) = -2x$ because $Var(R) = E(R)^2 - E^2(R)$ Hence $dVar(R)/dE(R) = -2E(R)$ as $dE^2(R)/d(E(R)) = 0$

Assuming $E(R^2)$ is independent of E(R)

hence $-4xy = 1/(8\alpha^2 \mu x^2)*(x^4 A + x^3 B + x^2 C + xD + E) - 1/(4 \alpha^2 \mu x^2)*(x^3 4A + x^2 3B + x 3C + D)$

Therefore, simplifying the above equation gives a polynomial function of fixed coefficients with respect to E(R) and various powers. Hence, We have shown by a mathematical proof that the variance of risk is a polynomial function of the expectation of risk. This proof displays the merit to show that following this structure of risk like adopted under the purview of our structuring, realistic concerns about dynamic structure of risk are highlighted and theoretical assertions pervasive in the literature about the polynomial structure of dynamic complex systems like the risk structure and composition are verified.

Yu and Loskot (2022) stated that: “ Polynomial distributions provide a superior flexibility over other canonical distributions, albeit at a cost of large number of parameters and the support interval is constrained to a finite range of values. The main advantage of polynomial distributions is that they can yield parameterized closed form mathematical expressions as well as offer a much greater

flexibility in modeling time evolution of probability distribution for example when describing causal interactions in complex systems and modeling state transitions in dynamic systems”

The concise fathoming of risk distribution helps proceed to comprehensive early warning for the sake of making risk management serve for financial instability mitigation and ensure better resilience from the onslaught of financial meltdowns under the scope of better shaped prudential surveillance schemes.

This is due to the fact that once risk distribution over time based on time series data is better framed the issue of early warning gets more stringent and the likelihood of forecasting future evolution of risk gets better ensured which allows better forecasting of coming resilience from financial instability and better financial sectors' supervision in terms of systemic exposure.

The time series expression of Risk should be a PDL polynomial distributed lag which corresponds to an ARDL autoregressive distributed lags model but for whom variance is not constant but polynomial as the variance is expressed as a polynomial in function of expectation.

It is worthless to state that financial phenomena should be modeled accurately in order to pave the way for an accurate estimation for forecasting purposes and hence either early warning modeling or merely displaying new features in the Balance scorecard for monitoring and policy making. Most micro-financial phenomena are modeled in ARDL or VAR or seasonal models. But the accurate estimation technique that conveys most of specification for Risk is the PDL or polynomial distributed lags estimation technique.

The Basel Frameworks Weaknesses and The Requirement to Unveil Its Shortcomings

The Basel Frameworks' Weaknesses

According to Borio and Crockett (2000): “One of the vulnerabilities of the Basel II and III instruments mentioned in the literature is that the cyclical and structural dimensions are predominant, generating opacity, interconnectivity and complexity that get in the way of good prudential supervision”. The main instruments frequently used are:

Reserve requirements (RR), Loan-to-deposit ratio. (LTD), Counter-cyclical capital buffers (CCB), Internal Capital Adequacy Pricing (ICAAP), Interest rate risk in banking risk (RTIRB).m Loan-to-value ratio (LTV)

These instruments are taking the functional form of ratios which does not give precedence to economic concepts with concise analytical merits, such as the marginal effects analyses included in the (sensitivities). The Instruments used would be static rather than dynamic in terms of dependence on the time factor. The Functional Form undermines the merits of considering marginal impact effects with overriding implications for economic policy and economic analysis. The instruments are shown to be unsuitable for short-term equilibrium cyclical adjustments (with the exception of counter-cyclical capital buffers) or long-term equilibrium longitudinal adjustments.

The relationships between financial stability and prudential instruments are implicit, and not materialized by concise quantitative estimates, but rather by PROBIT-type qualitative response models, which would be too non-contributory. The main drawback of the Basel IV framework which is the so called revised standardized approach is that usually instruments are taking the form of probabilities (Risk measures) which are of low value (inferior to 1)...

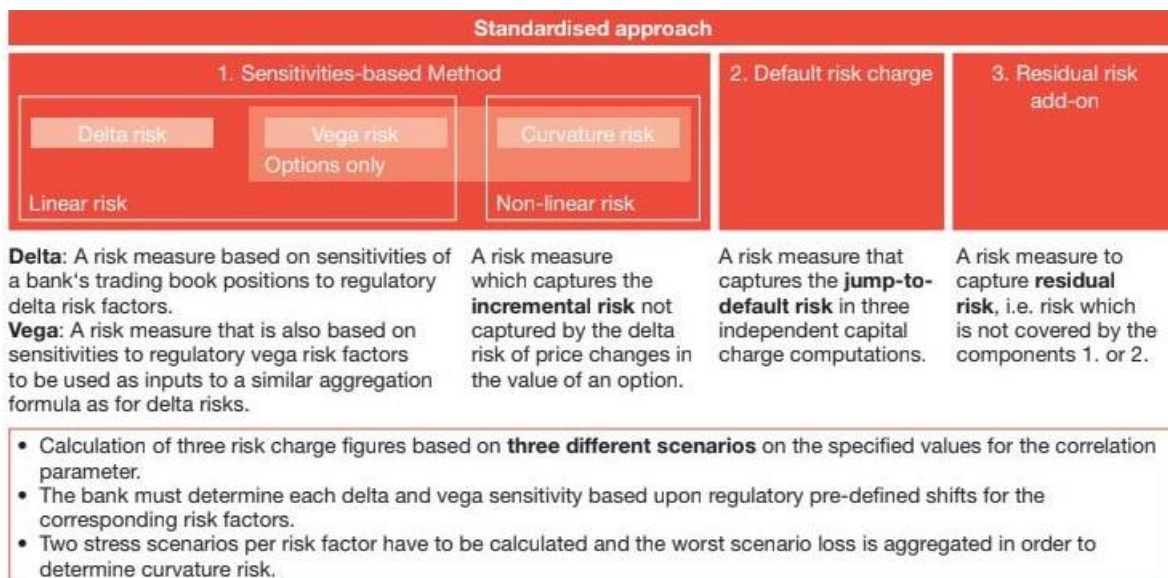


Figure 1: The revised standardized approach of Basel IV

Figure 1, the computation of the three risk charge figures Delta, Vega and the curvature risk as for the sensitivities based method pertaining to the discrepancies from the regulatory framework in terms of sensitivity alongside with the default risk of NPLs and the residual risk require an extrapolation based on three different scenarios on the specified values for the correlation parameter alongside with the jump to default risk and the residual risk. The first critic to assert about this conventional framework is that, empirically, these correlation parameters are extracted from estimations of elasticities of the kind in Genc (2012) where there are four possibilities for formulations of elasticities each with a certain adequacy and goodness of fit depending on the value of the elasticity per se.

Eventually, with computations of sensitivities there would have been no problems. But still a main hindrance to the computation of the sensitivity is the specificity of the mathematical formula that requires having discrete functions that are derivable in mathematical analysis. If not estimation of the elasticity or computation of the economic simplification assumption is required. The authors as documented in Banks and Al (1997) find that for values of sensitivities that are low it is that the approximation of the sensitivity ; the one that is commonly used in economics which is $e(A/B) = (\Delta A/\Delta B * B/A)$ performs better than any estimator corresponding to their estimation technique and to any other estimation technique like the ECM (Error correction modeling) or ARDL (Autoregressive dynamic lags) by Perasan and Shin (2001).

Hence, due to the fact that it still stands approximate it is not a very concise estimator of the market risk which is the Basel IV sensitivity-based instrument of the standardized approach based on sensitivities of market risk either linear or non-linear. One main additional drawback or the second critic to be asserted is that the risk measures are not balanced in their formulations meaning that a sensitivity in numeric differs widely from a default risk computation which creates a mismatch in descriptive statistics and might result in neglecting the effect of sensitivities computations in variation.

A sum of three items should ascertain they have the scope of providing the same functional form to ascertain a balance in their scope. The last critic is that no reference to risk moments is accounted in the Basel framework even though their effect on evolution of risk either ex-post for actual risk assessment or ex-ante for early warning assessment reveals of rudimental importance to better shape prudential intervention or supervision.

The Requirement of Unveiling Basel Framework Shortcomings

It is obviously pre-required in terms of resilience from the onslaught of financial crises to tackle the root items lying behind financial instability in each sector. Therefore, it is seemingly inaccurate to base resilience from financial instability on the Basel framework whose aim is specific to mitigating financial instability that affects the credit sector.

As a matter of fact, although financial instability pertaining to the credit sector is of commensurate importance and relevance, it still stands that a lot has to be achieved in terms of resilience from Stock market risk or financial instability coming from excess volatility of share prices as they might herald the onslaught of a Stock market crash for whom an adequate and specific prudential surveillance framework should be engineered and adopted for the sake of avoiding financial vulnerability that comes from excess volatility of share prices and might be exacerbated by a Stock crash or excess bullish slope of the stock index that might be due to excessive speculation.

Excessive speculation is in many instance is abrupt meaning it might erupt unexpectedly and in other cases it is predictable by the cross correlation of share prices that present a comparable pattern of evolution and might move in parallel which is a signal of a vulnerability that requires more scrutiny and to be covered in a section that will flow. As far as the use of ratios that are seemingly neglecting key features of economic functions allowing for structural and conjectural analyses and marginal effects calibration, there still stands that a PhD dissertation presented in (2022) by M Miras Marzouki still unpublished that discussed complementary instruments to Basel II and III framework and that used a sensitivity approach based on a macroeconomic perspective which presumably performs better in terms of estimation with high values of sensitivities that according to Banks (1997) provide estimators with more accuracy than the approximation commonly used in economics that would be a must as an estimator for the Basel IV standardized approach.

For this estimations the PhD dissertation entitled : « A theory of financial strategic foresight and prudential engineering : Case of Tunisia » used the estimation method ARDL autoregressive dynamic lags for time series regressions and BOUND tests for long run early warning systems. As far as the qualification of financial stability is concerned, it should be pointed out that this is a phenomenon that can be qualified rather than quantified, and which consequently requires qualifiers aimed at determining it, or phenomena closely related to it such as (MP efficiency, banking system efficiency, borrower solvency, crowding-out effect, etc.) rather than effects as enshrined in conventional instruments (capital buffers, reserve requirements, liquidity risk ratios, etc.).

The sensitivities to be proposed can be interpreted as phenomena, whereas the conventional Bale ratios are effects, which would be ill-suited to qualify a non-quantifiable phenomenon such as financial stability, if not by a qualitative response model of the PROBIT type, with two alternatives - one to confirm stability and one to deny it - which would be insufficient to qualify financial instability Basel IV framework is based on a sensitivity approach with a methodology based on market risk assessment extracted what is called uncertainty microeconomics.

In definitive, as much as this subject is concerned there is a lot of skepticism concerning functional forms and theoretical meanings of adopted prudential instruments that raises a debate on effectuality of making accurate use of them when dealing with resilience from onslaught of financial meltdowns. Still it stands that overall these are meant to exclusively deal with systemic exposure that emanates from the banking sector whereas prudential surveillance is meant for mitigation of financial instability root items.

Those are not necessarily originating from the banking sector but can eventually occur in the Stock market sector due to excess volatility of share prices that can exacerbate market risk far beyond tolerable to ensure stability of the financial system or what can emulate from the risk of onslaught of Stock market crashes eventually whose probability of occurrence increases with excess volatility of Stock share prices. Therefore, a lot of criticism should be conveyed to the Basel framework in general and there is a lot of doubt as to whether it is an effectual prudential framework that can ensure effective resilience of financial stability and mitigate systemic risk to the financial system.

An issue of prominent relevance for the subject matter is about investor risk appetite for whom a lot of concern should be expressed as to whether it is pro-cyclical with the business cycle counter-cyclical or a-cyclical because business cycle effects play a predominant role in terms of the effect of economic performance on financial stability at a first place and as long as monetary policy is intended primarily for price and output stability there is much concern about the effect of business cycle fluctuations on the interaction between prudential policy and monetary policy.

Risk Mitigation and Variance Of Risk Attenuation

Among the main shortcomings of the Basel frameworks stands the fact that its scope is exclusively to mitigate risk. But there should be room for consideration of variance of risk assessments and framing as risk is a random variable and the more it is dispersed in probability of occurrence the more it is unpredictable hence not subject to accurate consideration and not accounted for in a precise way. Thus a more appropriate goal for prudential surveillance should be risk variance framing alongside mitigation of expectation of risk as currently adopted and also it should consider targeting forecasting of future evolution of skew and kurtosis of risk tails as they reveal of rudimental relevance for the assessment of future evolution of risk.

Alongside risk mitigation of risk coming from liquidity and credit risk from the banking perspective and excess volatility and hedging deteriorating consequences coming from trading of securities, it is clear that a perspective directed towards economic and business projects where project risk is divided into equity relative risk and external borrowing relative risk grasps the credit risk pertaining to the banking sector and one part of volatility in the share prices coming from disinformativeness with respect to share prices and profitability outcomes pertaining to the stock market sector. As long as project risk should be conveyed more impetus adequate concern should be directed towards variance of risk as mainly expectations have dispersed probabilities depending on what performance really occurs. Hence it matters a lot how would realizations of earnings happen to be per se and compared to each other. Project risk should be considered rather from the perspective of variance of risk rather than risk in itself. In this respect the variance of risk matters far more than its expectation provided risk is taken for a random variable.

The Need for Backtesting and A General Appraisal of Basel Framework Shortcomings

Acerbi and Szchely (2015) stated that:

“ Back-testing is a test used to ensure that the model yields forecasts that are in line with the actual realities in other words it is used to check the validity and viability of the model in capturing risk”. This misconception of back-testing has become the root obstacle for the Basel committee to fully implement Expected shortfall as the standard regulatory risk measure. Indeed, they found out that “ES cannot be used to rank different point forecasts in a decision theoretically way” as stated in Ziegel (2014).

Summing up the above-mentioned analyses about the standard regulatory frameworks methodological approaches of risk capturing and prudential instruments setting in Basel II and III agreements, it is obvious that these regulatory frameworks should be subjected to partial reconsideration and up grading if not full reconsideration with an ulterior engineering methodology of newly set instruments paving the way for a full grasping of the pre-requirements for an adequate implementation of the must of risk mitigation and financial vulnerability attenuation as purported by the Basel committee but through an other perspective of instruments setting and modeling. The attempt made by the Basel IV framework about upgrading the expected shortfall about market risk has displayed many advantages drawing the wedge between the requirement of backtesting various point estimates through the mention of the key features of risk suggestible to three scenarios.

The three risk charge figures which are namely the Delta Vega and the incremental risk require an extrapolation based on three different scenarios on the specified values for the correlation parameter. These key risk factors are the key contribution of Basel IV and still represent a shortage in terms of complexity, inter-connectiveness and opacity like stated by Borio and Crockett (2000) Besides and most obviously there is an urgent call of complementing the entire prudential framework aimed at insulating the credit market from market risk summarized in credit and liquidity risk in brief to deal with a market risk emanating from another financial sector. These are under the purview of the scope of Stock market prudential engineering presented and discussed later in the paper in the following section.

Early Warning as A Prerequisite for Unveiling Future Threats to Financial Stability

Early warning in prudential surveillance is assumed to prompt forward guidance of key time dependent and financial instability related items in a way that dismays future exposure to financial meltdowns. Prudential as instruments as for Basel II and III and even those sensitivity based of Basel IV are bound to shortsightedness in that they target the short run. They do not display features that shields for expected futures exposure to financial meltdowns or sources of systemic exposure.

According to us there should be room for conducting co-integration or Bound tests for variables that are not stationary of the same order like in Perasan and Shin (2001) for Delta, Vega and the residual risk and the default risk at least if not as a minimum requirement to be conditional on further analyses such as Markov switching modeling and related jump effects tracing for Basel IV framework of additional instruments.

The Bound test should test for the long run relationship with a benchmark risk sensitivity which is the willingness of the banking system to bear excessive risk for the search for yield motivation which is the sensitivity of new production of credit to the private sector to money market rate or e(NCPS/MMR). Henceforth with an implicit testing for co-integration or Bound testing, we ensure that early warning is available in that the prudential regulator is alarmed in advance from future threats whenever over the long run the various types of risk ; Delta, Vega and the residual risk for market risk have long run relationships with the benchmark risk that expresses the Imprudence of the banking sector in terms of risk exposure for a search for yield motivation.

The rationale for the chosen benchmark for excessive risk is that private credit bears excessive risk exposure and is beneficial in terms of profitability for banks. Yet the reasoning that early warning should prevail is also valid for upgrading Basel II and III as even this framework is shortsighted in that it does not proceed to early warning for the sake of ensuring resilience from the onslaught of financial meltdowns stemming from financial instability with early warning or in advance what requires adopting long run relationship testing as available in co-integration and Bound testing.

The Balanced Scorecard Risk Related Instrument and Its Implication on the Integration of Financial Sectors

The Balanced Score Card is a key concept for the integration of financial sectors. According to Abdali (2013) « The integration between performance and risk management enables organizations to both monitor and evaluate the performance effectually through the balanced scorecard and to prevent further unfavorable consequences resulting from uncertain performance ». Gordona, Loeba and Tseng (2009) discussed the new trend in viewing the risk management. They noticed the new trend of holistic view of risk management which is commonly referred to as enterprise risk management (ERM). According to them : « Five factors have an impact on the ERM. These factors are ; the environmental uncertainty, the industry competition, the firm complexity, and its size and the Board of directors' monitoring » These factors fall into the scope of rational assessment of investment by traders in the secondary market. Their assessment is intended to depict expected beneficial investment opportunities and does affect fluctuations of the Stock market index with pikes and troughs.

But, as far as financial stability pertaining to the stock market is concerned, it still stands that the key factor or criterion of prominent relevance for excess volatility of the Stock market index which is compromising for financial stability is the cross correlation between share prices which is not available in the BSC. Nonetheless the BSC can provide a clue about the patterns of the Stock market index and henceforth through the diversification of trading for the sake of disentangling the traders from the commonly followed behavior that binds the average trend of the stock index. This has the effect of dampening excess volatility up to a certain limit. Bu it is yet uncertain how far does the portfolio diversification of rational investors affect excess fluctuations and how far it affects excess volatility.

Anyway the BSC is expected to provide a clear assessment of expected risk and uncertainty about future corporations performance financially and non financially. As far as the BSC is concerned Beasley, Chen Nunez and Wright (2006) put an emphasis on the potential benefits of developing a set key risk indicator KRI. They stated that : « The potential value of KRI may be derived from different contributions such as risk appetite by determining an appropriate threshold for action at different organizations levels. Risk and opportunity identified by designing KRIs to alert management to trends that may affect the achievement of organizational objectives or may introduce new opportunities. Risk treatment by serving mechanisms for organizational units and Risk reporting by providing measurable data conclusive to aggregation » These features fall into the scope of annihilating the cross correlation among share prices as they display for the trader the required tools to diversify his trading strategy so that it gets disentangled from mass comparable trading strategies that not only motivate cross correlations among share prices but also minimize expected earnings as they are shared opportunities rather than innovations in depicting favorable opportunities most expected to be beneficial.

The BSC draws a wedge between unveiling the risk management root items and hence the creditworthiness of the corporation into consideration and its effect or contribution in credit risk or risk of non-performing loans for the credit sector which is a building block of financial instability from the standpoint of the credit sector and the rational information gathering sources for traders in the Stock market that involves efficiency and stability whereby as stated earlier efficiency of the stock market is related to its stability. Nevertheless it still stands that financial stability ffrom the stock market perspective is compromised by excess volatility of stock prices whose fluctuations are essentially due to cross correlated stocks i.e stocks that vary in the same direction once a perturbation occurs. Besides basically financial stability from the stock market standpoint is threatened by irrationally based trading or trading that is more likely to be beneficial and lead to a bandwagon effect of following up or what we might call a speculative attack that compromises tremendously stock market stability.

The balanced scorecard affects considerably the MBV and by of consequence Stock market efficiency. It is also obvious that it affects excess volatility of share prices even if there are claims that investor trading patterns are driven by sentiment and irrationally cast patterns of purchasing and selling of Stock. The BSC ensures that an adequate assessment of risk aspects pertaining to corporations can exhibit future patterns of profitability and by a way of consequence make information accessible to traders more adequate and less asymmetric fact that ensures least volatility in face of clear foresightedness of future profitability expectations. Thus, affordability of a reliable balanced scorecard in itself can help mitigate financial instability provided the irrationality of traders is rational up to a certain point which is not guaranteed.

As a matter of fact, disrespectfully of the fact that the risk assessment of an entrepreneurial activity of a quoted corporation is trivial for financial stability pertaining to the Stock market sector it still stands of commensurate relevance for financial stability

considerations pertaining to the credit sector. Indeed, borrowers' credit worthiness and credit scoring which are of prominent relevance for credit risk assessed by banks, the BSC provides key information of prominent relevance for unveiling uncertainty for risk assessment by the credit sector. By a way of consequence the assessment of borrowers' credit worthiness becomes more accurate and credit risk which is proportional to financial instability is attenuated.

The interaction between the stock market sector and the credit sector is better fathomed once we settle an accurate and precise BSC. This is essentially due to the fact that rational assessment of corporations by traders in the stock market goes in parallel with the corporations solvency and its credit worthiness vis-à-vis the bank or the loan supplier which affects financial instability of the credit sector and eventually borrowing costs subject to risk premiums assessments. Excess volatility of stock prices results from cross correlations between stock prices fluctuations and not excess risk entailed by the corporations operations. As long as risk is taken into consideration especially if it is clearly specified In the balance scorecard investor trading behavior becomes rational subject to objective assessment.

By a way of consequence earnings prospects are attenuated considerably except for those investment opportunities that surprise the market. Indeed these beneficial trading opportunities cannot be involving the concern of rationally guided investors that analyze objectively their investment opportunities based on available information including the balance scorecard. Nevertheless it still stands that the better shaped is the BSC the closer is the MBV (market to book value) to 1 and the more efficient is the stock market.

Early Warning Systems, Long Run Prudential Surveillance Convergence and Markov Switching Regimes

The process is as follows: Ensuring a stable income stream ias a priority for banks maintains resilience from the onslaught of liquidity risk that triggers credit risk. Indeed, as continuous profitability decreases liquidity behaves as well. This drives the bank motivated by the search for yield motivation to incurring more risk because risky assets bear more risk premiums that increase profitability and this exacerbates financial instability.

A rule of thumb in financial management consists in ensuring stable future income streams to diminish future liquidity or turnover risk. Therefore, maintaining continuous stable income streams through ensuring a ceiling on long term debt dissuades the bank in advance to incur the hindrance of supporting a risk return tradeoff later in what we call an early warning procedure to avoid future vulnerability and foresightedness about stable income streams.

Early warning in the stock market occurs by smoothing the super-multiplier effect. This can be eased through inciting long term placement either by following the Board of Governors of the Federal Reserve System (2023) that call the urge for ensuring long term debt obviously through decreasing the cost of long term debt and thus increasing the cost of long term equity financing which occurs through the financial accelerator effect or through adding favorable extra conditions for long term stakeholders through allowing them for benefiting from more governance and bargaining power on corporations management policy. The effect would be decreased share price volatility over the long run and henceforth mitigated financial instability.

Smoothing the super-multiplier effect requires capping the long term borrowing rate and in parallel ceiling the long term placement dividend rate So that share prices volatility is decreased in synchrony with ensured long run income streams for the credit sector. And hence stability of both financial sectors is ensured.

Currently Adopted Early Warning Systems

In parallel to early warning measures, federal agencies have provided lately supervision requirement for large banks to maintain long term debt to ensure resilience from losses and financial stability as stated by the Board of Governors of the Federal Reserve System (2023).

	Assessment of current financial condition	Forecasting future financial condition	Use of quantitative analysis and statistical procedures	Inclusion of qualitative assessments	Specific focus on risk categories	Link with formal supervisory action
Supervisory ratings						
- on-site	***	*	*	***	*	***
- off-site	***	*	**	**	**	*
Financial ratio and peer group analysis	***	*	***	*	**	*
Comprehensive bank risk assessment systems	***	**	**	**	***	***
Statistical models	**	***	***	*	**	*
* not significant						
** significant						
*** very significant						

Figure 2: Approaches to supervisory Risk and arly warning systems

In figure 2, the various approaches to supervisory risk assessment and early warning systems generic features show clearly forecasting future financial conditions, the use of quantitative analysis and statistical procedures as well as the inclusion of qualitative assessments as basic tools of early warning. These approaches fall under the scope of foresightedness and early warning as mainly most prudential measures of Basel II, III and IV target the short run and are intended to mitigate financial instability over the short

run. We will focus on the three columns; forecasting future financial conditions, the use of quantitative analysis and statistical procedures as well as the inclusion of qualitative assessments. Indeed, in the referred to literature as stated in Sahajwala and Bergh (2000) there are three main types of early warning systems:

- Scoring models of credit rating and awareness notation in instance
- Qualitative response models of the type logit with two outcomes. This type of early warning models although relying on strong theoretical assumptions lacks contribution in terms of interpretation of endogenous variables as they have two outcomes of the type pass or fail
- Artificial intelligence models currently used by several prudential authorities of the G10 countries

We propose with reference to the sensitivity based modeling discussed above a quantitative response models whereby the sensitivity expressing an impact effect is regressed in a time series regression for forecasting purposes. Once it is interpreted the values of the sensitivity explained provide a vast array of likely solutions to be interpreted accordingly to its interpretation. This method clearly outperforms the two first methods although Artificial intelligence models are claimed to be very effectual, but they remain essentially not statistical in nature or based on quantitative econometric analysis and forecasting which might be troublesome in terms of economic and financial interpretation.

For such contributive value the notion of sensitivity is a clue that annihilates disinformation about the quality of future key variables in that it displays the main feature through its merits of qualifying impact effects to show in quantitative response models qualitative information. For example, the sensitivity of new credit supply to the private sector to the money market rate is measurable as a quantitative variable and qualifies at the same time the notion of willingness of the banking system to bear excessive risk disrespectfully of the fact that it provides information on whether indeed the banking system would be willing to bear excessive risk or not.

Sensitivities should be modeled for the sake of setting early warning systems taking everything else equal about the method adopted for long run correlation or forecasting or whether Artificial intelligence should be adopted or not. Besides for early warning purposes a deep concern should be directed toward fathoming risk distribution and moments in order to permit to draw a certain pattern of future evolution of dispersion probability of risk expectation and to have better shaped clues about skew and Kurtosis that show where distribution is biased in the present and future if time series are adopted. The accurate fathoming of risk distribution permits to forecast in advance the interval of risk dispersion provided it is subjected to adjustment with respect to the variable items that are encompassed in its expression the uncertainty item the business cycle related item and the stable item.

Convergence and Gravity: An Appraisal of Dynamic Contagion Assessment

The concept of convergence involves the notion of catch up between financial development levels which is driven by the process of gravity across financial systems' development. The difference between gravity and convergence is that convergence is dynamic gravity which is assessed statistically across weighing of various point in time determinants and evolves to convergence when we add up the time dimension targeting the long run. The scope of convergence is an assessment of early warning about contagion. The law of gravitation stipulates that catch up celerity is inversely proportional to the financial stability discrepancies For high discrepancies of levels of financial development catch up is fast.

The convergence is a process that is intrincating because it assumes the prévalence of two effects that Work simultaneously contrariwise among levels of financial development and financial stability levels in a region. So either way catch up effect words through convergence between levels of financial development or levels of financial stability. When the discrepancies between financial stability levels are high convergence works through this channel and indeed discrepancies between financial system levels is low. When financial stability levels are close financial development are far away and convergence works through catch up of levels of development.

The scenario of self-sustaining convergence is least likely indeed because there are two simultaneous processes that work in same time. The total effect of convergence is the sum of the gravitation effect and attraction effect. The attraction occurs because of discrepancies in financial system effectiveness levels whereas the gravitation occurs because of discrepancies in financial stability levels. If the first effect outweighs the second the final effect is convergence. If the second effect outweighs the effect is gravitation or less convergence. Contagion here works as an accelerator of convergence because it takes financial stability closer and hence financial efficacy farther away and by a way of consequence convergence faster.

By measuring accurately convergence of financial sectors financial instability through gravity index we can fathom the pattern of evolution of cross correlation between financial sectors likelihood of contagion through time. Hence contagion or propagation detection can be informative in terms one point in time propagation likelihood whereas convergence through gravity can be informative about how this propagation likelihood evolves through time and can provide tool for deploying early warning grasping the long run pattern of propagation of financial crises in one region. Hence contagion detection is a descriptive instrument of awareness whereas convergence is an analytical instrument of awareness.

Eventually the overall pattern of evolution of convergence can be countered by institutional adjustments insulating one local financial system from risk of contagion from overseas financial systems. Thought convergence concerns financial deepening it is obvious that as documented in the literature financial efficiency is positively correlated with financial deepening and as long as financial efficiency is inversely related to financial stability, the argument of convergence still holds in the opposite direction for financial instability considerations. Indeed as financial development path converge to each other for instance à financial certain level of country A convergence to a financial deepening level of country B it is obvious that financial stability of country A convergence to financial instability of country B where financial deepening is an indicator of efficiency of the financial system. By a way of consequence we

can proxy the convergence index of financial deepening by the convergence index of financial instability or the inverse of the index for financial stability.

$E=MC^2$ proxied from the Einstein law of energy

CONVERGENCE IS THE ENERGY OF GRAVITATION MEANING THAT
 $CONVERGENCE_{ij} = (FINANCIAL DEVELOPMENT_i - FINANCIAL DEVELOPMENT_j) * GRAVITY_{ij}^2$
 $GRAVITY_{ij} = \frac{FINANCIAL DEVELOPMENT_i * FINANCIAL DEVELOPMENT_j}{(FINANCIAL OPENESS_i - FINANCIAL OPENESS_j)^2}$
 $CONVERGENCE_{ij} = (FINANCIAL DEVELOPMENT_i - FINANCIAL DEVELOPMENT_j) * \frac{FINANCIAL DEVELOPMENT_i^2 * FINANCIAL DEVELOPMENT_j^2}{(FINANCIAL OPENESS_i - FINANCIAL OPENESS_j)^4}$

The prominent feature of this index is that it provides insights on the long run pattern of evolution of predisposition to incur cross country contagion. Hence, the convergence computation provides an upgraded prudential instrument providing a better assessment than the conventional contagion assessment risk. This instrument falls into the scope of early warning from likely risks in the long run. Here risks are quantitative as well as qualitative.

Markov Switching Regimes for Jump Effects

One main feature of key salient instruments is that they are subject to a Brownian motion process or a jump process like credit risk as stated in Tak Kuen Siu (2010) where he discussed a Markov Regime Switching Marked Point Process for short rate analysis with credit risk where he emphasized that it is of commensurate importance to take into account jumping processes such as Markov switching regime processes because their adverse implications herald unexpectedly.

Therefore, as long as we discuss early warning, alongside the conventional time varying long run relationship as imbedded in co-integration and Bound tests, there should be room for testing for Markov switching regimes or brownian processes to be forwarded guided with respect to jump effects that herald unexpectedly for Markovian switching regimes and Brownian motions that are probabilistic and statistical phenomena with continuous innovations through time.

According to Tak Kuen Siu (2010) « Some information items such as surprise information and extraordinary market events may have large economic impact on short rates and cause jumps ». He reiterated that: « Short rate models based on Brownian information flows may not be appropriate to describe large movements. Jump diffusion processes or related processes incorporate large jumps such as Markov switching regimes » Thus, it is obvious that the kind of Markov switching regimes for credit risk or liquidity risk or rather illiquidity risk are not forecast able by conventional short run instruments toolkits that are especially targeting financial instability mitigation for the sake of abiding contingencies of the onslaught of financial meltdowns that might erupt abruptly and unexpectedly.

The Requirement of Backtesting

The most important item in early warning is back-testing which is a type of retro diction and cross validation applied to previous time periods. This procedure aims at drawing patterns for risk items that overlap and reproduce in order to better shape early warning. Modeling should be quantitative to provide concise parameters and phase shifts more likely than qualitative log-odds to frame the interval of evolution of predictions of risk and its moments. Even risk moments should be subjected to back-testing because probability distribution shows likelihood in a certain time point whereas back-testing them might show a pattern of reproduction not depictable through probability distribution.

Non-Performing Loans, Information Assymetries and Borrowers Credit Worthiness Effects on Prudentiality and Risk

NPLs Effects on Stock Market Volatility

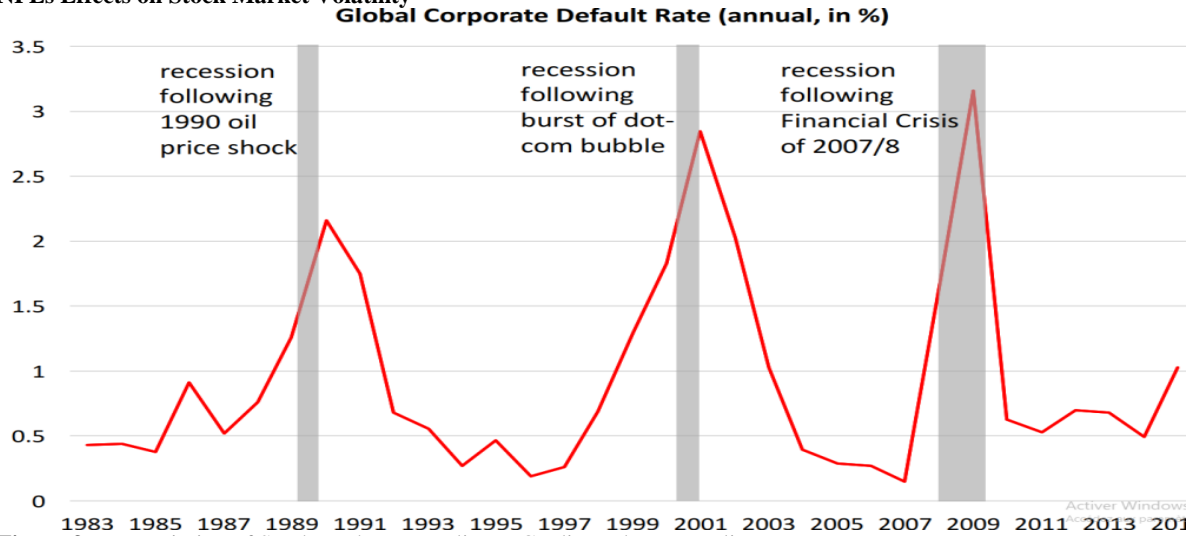


Figure 3: Transmission of Stock market anomalies to Credit market anomalies

Source: Book chapter on Risk management

In figure 3, Global corporate default rate have been showing pikes during recessions for the last three decades providing a clear proof that As NPLs increase the collaterals lose value MBV. Volatility of equity increases drastically. Stock market efficiency decreases accordingly because of mismatch in market to book value far beyond the prerequisites of investor sentiment and speculation in the stock market. Therefore non performing loans affect stock market volatility and efficiency and might herald explicitly the issue of super multiplier effect whereby volatility in stock markets translate after amplification into macroeconomic negative shocks as shown by the chart where pikes in NPLs correspond to periods of sharp recessions in the global economy after a short lag during which the transmission process of the super-multiplier occurs.

Effects of Information Assymetries and Cost of Agency on Stock Prices Volatility

The effects of agency costs and information asymmetries such as free riding and moral hazard are transmitted to bank profitability through the credit risk channel. The effects of leverage and the super-multiplier amplify uncertainty about risk rating and ultimately affect banking efficiency and private investment. Credit scoring and the assessment of borrowers' creditworthiness are subject to asymmetries, which significantly affect credit production and hence bank profitability, since most asset profitability is derived from credit production.

The more agency costs and information asymmetries prevail, the more bank profitability is deteriorated through unrecovered credits. Thus there is a negative relationship between agency costs and information asymmetries and bank profitability. In order to stop the circumvention of prudential measures of banking supervision, bank profitability should increase to dissuade bank management from resorting to malicious practices such as retargeting of bank customers and unfairness such as setting higher risk premiums for households than for firms in order to generate excess profit margins and to persuade shareholders to introduce more equity capital in order to favor the reduction of liquidity risk and to be able to generate excess profits by bearing a higher credit risk.

In order to increase ex-ante bank profitability, arrangement costs and information asymmetries would have to be reduced, and for these banks would have to rely less on the client histories provided by the scoring agencies and carry out more rigorous, albeit more costly, feasibility studies of projects. This is in order to reduce the costs of arrangement by learning effect and to reduce the information asymmetries by the reliability of the evaluation of the solvency of borrowers a priori and thus to be able to increase the banking profitability and to attenuate the systemic risk and the financial instability and perhaps even to attenuate the negative macroeconomic shocks such as well stated by the phenomenon of the super-multiplier according to which shocks perceived by the volatility of equity prices and therefore automatically of the profitability of assets are transmitted to the macroeconomic arena in an amplified manner.

Indeed, one can simultaneously act on the cost of agency and information asymmetries such as free riding, although this is contradictory. In fact, by lowering the agency cost, one would think that banks would save on the collection and analysis of data on the creditworthiness of borrowers and credit ratings. But it is necessary to say that by allocating a team specialized in the study of the feasibility of the projects, with the passing of time they acquire by phenomenon of learning of the aptitudes to well detect the profitable projects of those whose financing risks to reveal a not covered credit. In this way, both the cost of development and free riding are considerably reduced.

Importance of Effects of Borrowers Credit Worthiness on Stock Market Stability

As borrowers' credit worthiness improves external borrowing becomes less expensive there is a demand pull from stakeholders because of the financial acceleration corporations are better off Dividends decrease and share prices increase contrariwise to volatility which is dampened because of the bargaining power that is reduced for stakeholders and more bargaining power for corporations management which makes stability improve and stock market more resilient to the onslaught of financial distress like a stock market crash. Contrariwise when borrowers' Creditworthiness deteriorates stock market sector is less stable in terms of financial stability.

Implications on Stability and Prudentiality

Borrowers credit worthiness affects tremendously the cost of external borrowing for corporations that are priced at the stock exchange. An improvement in borrowers credit worthiness affects the leverage effect or the financial accelerator effect. An improvement in the net worth of corporations is generally associated with an improvement in Borrowers credit worthiness which relaxes the cost of external borrowing in such a way that there exists a demand pull from corporations management with respect to equity thereby improving the bargaining power of the management with respect to stakeholders that react by decreasing fluctuations of the cost push on dividends.

The capital asset pricing model states that dividends are inversely proportional to share prices. This in turn makes fluctuations of share prices deteriorate. Therefore, an improvement in borrowers credit worthiness deteriorates excess volatility of share prices thereby exacerbating stock market sector financial stability through the bargaining power channel whereby a lack of dependency on equity decreases volatility of dividends and by a way of consequence increases volatility of share prices deteriorating thereby the market risk in the stock market sector.

Hedging Risk and Prudentiality: An Appraisal

It is considered that derivatives increase the efficiency of the financial system. By a way of consequence they deteriorate stability. Here surges a conundrum whereby from one side derivatives hedge from losses and by a way of consequence market risk and from the other side by deteriorating stability they call the urge for further Prudential intervening. But as long as the most prominent role of prudential intervention is ensuring more stability. It is consented that prudential instruments are mainly purporting at mitigating the very source of market risk which is excess volatility. But given the nature of hedging of derivatives, excess volatility does not necessarily compromise market risk for investors in the sense of presenting a source of loss.

So where does the threat from derivatives to stability really come from? Corporate hedging affects directly Stock market stability through the risk management related issue affecting equity and henceforth valuation either book or market one and indirectly through its effect on the credit transmission mechanism of credit that by affecting monetary policy stance exerts an impact on overall financial stability and in special stock market stability.

The Prudential Role Played by Hedging and The Transmission of Qualitative Risk Across Financial Sectors

The issue of prudential surveillance is especially concerned by the use of derivatives. As a matter of fact; on the one hand by improving efficiency and stability the use of hedging instruments alleviate burdens on the task of prudential surveillance by making it easier to promote financial stability and efficiency; but on the other hand by helping create crises and increasing systemic risk in the case of speculation and speculative attacks on exchange positions the use of derivatives worsens the situation and urges the call for contagion targeting prudential instruments.

Hedging does play a macro prudential role by capping the riskiness of expected returns that are fundamental in increasing volatility of stock returns. As a matter of fact volatility of stock returns is the core source of systemic risk in stock market as it is pro cyclical with its own industry average behavior of returns and the business cycle and determines the pattern of systemic exposure of the stock market because stock returns determine stock prices. So, by hedging we break the pattern of volatility and covariance between stock prices whenever hedging in itself is not systemic or does not hold for all similar stock securities. Certainly, hedging plays a macro prudential role but cannot be taken for a macro prudential instrument as it is not intended at mitigating financial vulnerability but at ensuring minimizing losses on returns.

As long as the objectives of hedging and prudential surveillance are different they cannot be taken for holding as fulfilling the same task. A qualitative assessment of Risk is transmitted through financial sectors through hedging. As long as hedging conveys a bias in the assessment of the MBV of corporation, it follows that it generates a tradeoff between Risk in the credit sector and risk in the Stock market sector. Indeed, Shielding the Stock market from quantitative Risk of losses will exacerbate the qualitative exposure of the banking sector prominently.

Hedging and Borrowers' Credit Worthiness

Hedging is about a financial strategy of derivatives that derives from conventional financial instruments that uses financial instruments or market strategies to offset the risk of any adverse price movements. Investors hedge one investment by making a trade in another. In pure economic terms this introduces frictions that display merits in terms of expectations and probabilities of earnings for investors as it works as a warranty for shielding from losses. But these frictions will essentially lead through contagion to a bad quality of assets whereby corporations hedging for the outcome of acquisitions and transactions that are quoted in the stock market are likely not to care about a criterion that affects tremendously the cost of borrowing which is the analogous source of financing for equity. Henceforth this will introduce of bias of selection and exacerbate the financial stability of the credit market.

Indeed, as long as the corporation assets are hedged against future losses it will matter least for the corporation management if the cost of external borrowing is minimized. This will affect negatively borrowers' credit worthiness as the corporation management will no longer care about the way the financial intermediary which is the bank will shed the light on their probability of default or what could be called their borrowers' credit worthiness. This will introduce an information asymmetry which is adverse selection and will lead the corporation to have a misconduct about expansion projects appraisal and risk of default which will exacerbate financial stability from the credit sector side. The pervasiveness of information draws a wedge between stock market valuation and assets quality.

Usually, stock that performs well is backed by a good quality assets which informs on a sound management of the corporation from which the asset derives from. This means that stock that performs well enough and that does not need hedging is that which corresponds to a sound management and therefore a fairly good borrowers' credit worthiness. The rule of thumb is that if the corporation does not default with the bank it is more likely to make its shares stand for a good asset and therefore perform well and not require hedging to ensure a benefit for investors. So, in definitive although hedging exerts a positive effect on Stock market financial stability it does exert a negative effect on credit market financial stability. There is a skepticism about its overall effect as it is tough to weigh the effect of warranting expected future losses in the stock market with the effect of a deterioration in borrowers' credit worthiness and the probability of default on loans which is very harmful in terms of financial stability.

Hedging and the Balanced Score Card based Risk Cross Financial Sector Assessment

Hedging is about a financial strategy of derivatives that derives from conventional financial instruments that uses financial instruments or market strategies to offset the risk of any adverse price movements. Investors hedge one investment by making a trade in another. In pure economic terms, this introduces frictions that display merits in terms of expectations and probabilities of earnings for investors as it works as a warranty for shielding from losses. But these frictions will essentially lead through contagion to a bad quality of assets whereby corporations hedging for the outcome of acquisitions and transactions that are quoted in the stock market are likely not to care about a criterion that affects tremendously the cost of borrowing which is the analogous source of financing for equity.

At this stage it is noteworthy that by making recourse to hedging we neglect the balanced scorecard suggestions about risk management as earnings are guaranteed disrespectfully of the assessment of risk and the organizational hindrances to performance improvements that might exacerbate borrowers' credit worthiness and the probability of non-performing loans. Henceforth this will introduce of bias of selection and exacerbate the financial stability of the credit market.

Indeed, as long as the corporation assets are hedged against future losses it will matter least for the corporation management if the cost of external borrowing is minimized. This will affect negatively borrowers' credit worthiness as the corporation management will no longer care about the way the financial intermediary which is the bank will shed the light on their probability of default or what could be called their borrowers' credit worthiness. Besides they will neglect the balanced scorecard supervision advices about risk management and organizational implications on performance.

This will introduce an information asymmetry which is adverse selection and will lead the corporation to have a misconduct about expansion projects appraisal and risk of default which will exacerbate financial stability from the credit sector side. The pervasiveness of information draws a wedge between stock market valuation and assets quality. Usually stock that performs well is backed by a good quality assets which informs on a sound management of the corporation from which the asset derives from. This means that stock that performs well enough and that does not need hedging is that which corresponds to a sound management and therefore a fairly good borrowers' credit worthiness.

The rule of thumb is that if the corporation does not default with the bank it is more likely to make its shares stand for a good asset and therefore perform well and not require hedging to ensure a benefit for investors. So in definitive although hedging exerts a positive effect on Stock market financial stability it does exert a negative effect on credit market financial stability. There is skepticism about its overall effect as it is tough to weigh the effect of warranting expected future losses in the stock market with the effect of a deterioration in borrowers' credit worthiness and the probability of default on loans which is very harmful in terms of financial stability.

Conclusions

The fundamental added value of this research is about setting a new structure of formulation of Risk and the resulting distribution of risk that reveals complying to finance theoretical predilections of a polynomial structure. Alongside key drawbacks of the currently adopted prudential framework and the alternative solutions to annihilate its drawbacks the risk formulation drags the wedge of conventional framing of risk and one key issue which is early warning deployed either through sensitivity forecasting models with long run co-integration or jump effects models like the regime switching models. There is an outstanding pervasiveness of prudential instruments displaying the major drawbacks of interconnectedness, complexity and opacity along with the inability of back-testing and other drawbacks such as inaccurate estimation ability of the risk charge figures Delta, Vega and the incremental risk for market risk pertaining to the credit sector as displayed in Basel IV and that should be dealt with accurately.

Financial vulnerability is more complex to mitigate in the framework related to the stock market because of the prevalence of excess volatility of stock as a key threat to Stock market stability and require engineering of the adequate instruments aiming at mitigating excess volatility of share prices. Main features characterizing the credit market such as the prevalence of information asymmetries the relevance of taking into account borrowers' credit worthiness which are the corporations securitized in the stock exchange and

the importance of Non-performing loans should be accounted for with deep concern whenever the financial accelerator effect and the super-multiplier effect are framed in perspective with the requirement of mitigating financial instability heralding in the stock market. The conventional prudential surveillance frameworks are displaying a shortsightedness and are valid exclusively for the short run disrespectfully of the requirement of proceeding to early warning and long run forecasting for the sake of annihilating the likelihood of unexpected outbursts of financial distress.

This is mainly due to the fact that the features that render financial crises and bank runs very harmful is the fact that they hit unexpectedly without allowing for a time span for the regulator to react in a curative manner and should therefore be maneuvered in advance following a certain scrutinizing of risk dispersion and moments which are the skew and Kurtosis. Therefore, the adopted preventive approaches that help upgrade the short run prudential frameworks and the early warning approach are the best fit for mitigating the likelihood of outburst of financial meltdowns. Based on the theoretical underpinnings according to which financial instability is a tradeoff between stock market excess volatility and credit market risk and eventually insurance market risk in another instance of analysis, it is shown that the systemic character of risk forbids containing risk exposure simultaneously to the credit and stock market sectors and hence leads few room to synchronized risk mitigation through the entire financial system.

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