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THE NEXUS BETWEEN CONVENTIONAL BASEL FRAMEWORKS AND OVERALL FINANCIAL INSTABILITY MITIGATION PREREQUISITES

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Abstract

This article discusses theoretically the notion of risk stemming from the financial sector with a perspective closely linked to criteria involving various financial stability related aspects of risk. It reinvigorates the conventional Basel framework in its second third and fourth versions by attempting to elucidate their shortcomings afferent to their purview and scope and tries to complement them by enunciating the requirement of setting a prudential framework that tackles the issue of financial instability emanating from the stock market for the scope of going deeper inside the fundamentals of risk stemming from the Stock market and a thorough early warning approach dealing with the issue of the hindrance of time reaction mismatch of the prudential authority and hence the priority of setting a long run forwarded guided prudential surveillance methodology to avoid the surprise effect of unforecasted events that might erupt abruptly for the purview of the scope of predicting forthcoming risks in advance. The early warning purview unveils the requirement of ensuring in advance resilience from the onslaught of financial crises for the sake of annihilating threats to financial stability over the long run and reveals to be the best initiative to take in order to solve the contingency of having to deal with unexpected risks that might arise abruptly and should have been dealt with in advance as time reaction simultaneous to actual occurrence of hindrances is not affordable.

Keywords: Basel Framework Shortcomings, Financial Instability Mitigation, Early Warning Systems

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1. 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

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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 disinformativeness 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 curtosis 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.

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2. A NEW COMPOSITION OF RISK AND A BINDING CONDITION FOR RISK DISTRIBUTION IN COMPLIANCE WITH FINANCE THEORY

2.1 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 cyclicality 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 cyclicality nor to industry specificities and is distinguished by asymptotic un-correlation and asymptotic neglectibility 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 delt with within the framework of the Basel frameworks and stock market prudential regulation as documented in Basel II through IV as well as Marzouki and Mehri (2022) about prudential surveillance in the Stock market.

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.

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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.

2.2 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 disinformativeness 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.

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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 of 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 intermediaries, 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.

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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.

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

The 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(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.

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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.

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

And an extrapolation from the definition of Profitability Gap

Profitability Gap = Potential profitability – Actual profitability

= (Effectively likely risk)* (Measure of risk)

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 premiuns-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+α*μ* Exp (Risk))

Exp (R)= Var (R) + α*Exp (R)/(1+α*μ*Exp(R))

Var (R) = E (R) - α*E (R)/(1+α*μ*E(R)) (0)

Var (R) = $E(R)^2 – (E(R))^2$ (1)

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

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

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

Substituting into (1) gives

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

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

Setting expressions of Var R on the left handside yields

Var(R)* (1-1-Var (R)-2αE(R)/(1+αμE(R))=E^2(R)* (α^2-1- $\alpha^2\mu^2E^2$(R)- 2αμE(R)/(1+ α2μ2E2(R)+ αμE(R))

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

Therefore

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

Var (R) = E (R) - αE (R)/(1+αμE(R))= E(R)(1- α/(1+αμE(R)))

The second expression leads to

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

Therefore

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

Simplifying both sides by E(R) leads to

1+ α/ (1+αμE(R)) = (1/(1- α/ (1+αμE(R))) * (α^2-1- $\alpha^2\mu^2E^2$(R)- 2αμE(R))/(1+ $\alpha^2\mu^2E^2$(R)+ αμE(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 differenciation leads to

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

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

with introducting equation (0), Var(R) = E(R) – E(R)/(1+αμE(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

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

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

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

$d(y/x) =-2x$ because $Var(R) = E(R^2)\text{-}E^2(R)$ 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 $-4xy =1/(8\alpha^2\mu x^2)^*(x^4\ A+x^3\ B +x^2C +xD +E)\text{-}1/(4\ \alpha^2\mu x^2)^*(x^3\ 4A+x^2\ 3B+x\ 3C+D)$

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.

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3. THE BASEL FRAMEWORKS WEAKNESSES AND THE REQUIREMENT TO UNVEIL ITS SHORTCOMINGS

3.1. 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).

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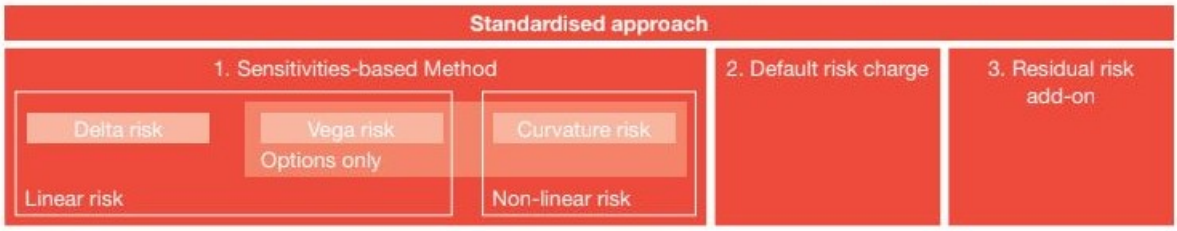
Fig. 5 Overview of the revised standardised approach



Delta: A risk measure based on sensitivities of a bank's trading book positions to regulatory delta risk factors.
Vega: A risk measure that is also based on sensitivities to regulatory vega risk factors to be used as inputs to a similar aggregation formula as for delta risks.

A risk measure which captures the **incremental risk** not captured by the delta risk of price changes in the value of an option.

A risk measure that captures the **jump-to-default risk** in three independent capital charge computations.

A risk measure to capture **residual risk**, i.e. risk which is not covered by the components 1. or 2.

- Calculation of three risk charge figures based on **three different scenarios** on the specified values for the correlation parameter.
- The bank must determine each delta and vega sensitivity based upon regulatory pre-defined shifts for the corresponding risk factors.
- Two stress scenarios per risk factor have to be calculated and the worst scenario loss is aggregated in order to determine curvature risk.

It is obvious that, 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 oter estimation technique like the ECM (Error correction modeling) or ARDL (Autoregressive dynamic lags) by Perasan and Shin (2001).

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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.

3.2 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 crush 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 crush 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.

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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 these 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.

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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 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.

3.3 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.

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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.

3.4 An Application of The Expected Shortfall Measure To Stock Market Risk

Weaknesses in Risk measurement and assessment: The concept of systemic shortfall:

Risk management tools that operate through measurement are aimed at enhancing financial stability and efficiency through computation of basic macro-prudential instruments, for instance.

In 1996, the Basel accord amendment introduced the Value at Risk risk measurement tool as the standard measure of risk as well as the fundamental risk metrics used to determine the regulatory capital requirement.

Hull (2012) defined the Value at Risk or VaR as:

“An attempt to provide a single number that summarizes total risk in a portfolio”.

But due to several weaknesses found in VaR measurement, such as its “incoherency” and its inability to capture “tail risk” the Basel committee has agrred to use an alternative measure to calibrate risk along the capital requirement. As a matter of fact, in 2012 it issued the notion of «expected shortfall”.

According to Acarbi and Szckely (2015) : « expected shortfall is the average of losses that are larger than VaR which implies it has the ability to capture tail risk and offers other advantages such as addictivity, mathematical tracability, uniqueness and uses the same risk models. »

Among its weaknesses that have been detected and still not resolved up to the present is that it cannot be “backtested”.

This feature is of paramount importance for the validity and viability of the model in capturing risk as it is closely linked to its abilityto provide forecasts.

Acerbi and Szchely (2015) stated that:

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"Backtesting 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 backtesting 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 need for Backtesting and a general appraisal of Basel framework shortcomings

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, interconnectiveness 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 summarised in credit and liquidity risk in brief to deal with a market risk emanating from an other financial sector.

These are under the purview of the scope of Stock market prudential engineering presented and discussed later in the paper in Section 4.

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3.5 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.

conditions.

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4. A PRIMER TO INTERACTION ACROSS FINANCIAL SECTORS; THE ISSUES OF FINANCIAL ACCELERATOR AND BORROWERS' CREDIT WORTHINESS OF CORPORATIONS

4.1. The Financial Accelerator

According to Fender Ingo (2000), "The concept of financial accelerator derives from informational asymmetries in the credit markets which drive a wedge between the costs of external and internal finance. In particular the higher cost of external finance reflects the agency costs of lending under asymmetric information. In such a situation internally generated funds enable firms to reduce their demand for costly external finance. Hence a fall in a borrower's net worth or cash flow raises the demand for external finance and subsequently reduces investment".

Given that negative shocks affect cash flows individually the effect of an initial shock to the economy is amplified. Small shocks might therefore create large cycles hence the term financial accelerator.

A restrictive monetary policy shock now reduces investment spending through the traditional cost of capital effect and given that changes in interest rates affect corporate cash flows lowers a firm's cash flow and its ability to borrow. Consequently, monetary policy impulses are reinforced by cash flow effects.

In the way literature the Modigliani Miller theorem (1958) states that financial structure is irrelevant to corporate investment decisions.

More recent research however has questioned the assumption of perfect substitutability of external and internal funds by pointing to the existence of capital market imperfections. The most common argument posits that asymmetric information and problems of contract enforcement lead to the emergence of agency costs thereby driving a wedge between the cost of external and internal finance. As outside investors require a premium for unobservable risks, external finance becomes more costly than internal finance.

The issues of NPLs and Borrowers' credit worthiness is closely linked to financial stability. They bind banking sector profitability and credit risk in a fashion that triggers financial meltdowns and exacerbates economic performance slowdown.

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According to Podpiera and Weil (2008) "from the 1990s up till the early 2000s a large number of banks in emerging economies collapsed owing to high non performing loans and worsened cost of efficiency.

This indeed was observed in balance sheets of banks in both emerging markets and advanced economies where NPLs were found to be major bottlenecks to their profitability".

According to Abiola and Olausi (2014) and Richard and Al (2008) "the failure of effectively monitor non performing loans or reduce high levels exceeding set thresholds may lead to insolvency."

Biabani and Al (2012) added "when a relatively large number of banks have NPLs surpassing their capital, banks crisis can follow which in the long run leads to a financial crisis".

Thus the root threats to financial stability are fathomed through a quantitative assessments of NPLs credit risk and borrowers credit worthiness at the banking sector level which lead us to adopt the perspective of the banking sector aggregates, and data to assess credit worthiness rather than at the individual bank or borrower.

The concept of information asymmetry was first posited in the seminal work of Akerlof (1970) in which the paper claimed that the existence of uneven dissemination of information between transacting parties resulted in an imperfect market.

According to Stiglitz (1981) "Information is imperfect and obtaining information can be costly. The extent of information asymmetry is affected by the actions of firms and individuals".

Kemei and Korengo (2014) attributed "high non performing loans in banks to lack of information".

Dell'aricca (2001) noted that "if the banks could effectively determine the Creditworthiness of borrowers deserving borrowers could get the credit facilities thereby reducing the high rate of loan default.

Conversely an adverse selection exposure whereby high risk borrowers displace Creditworthy borrowers could cause deterioration in overall bank loan portfolio leading to a buildup of NPLs".

Borrowers' credit worthiness is defined as e(NPL/Br) where NPL stands for Non Performing loans and Br for borrowing rates.

This measure which is e(NPL/Lr) is a sound proxy for borrowers credit worthiness because it is a signal of the extent of matching between the true risk entailed by borrowers and the computed risk encompassed in risk premiums accounted for in loan rates. It measures the matching between

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risk premiums accounting for the risk taken into consideration by banks and the actual risk as being implicit in the measure of non performing loans.

If this elasticity increases this means that as risk premiums increase, NPLs are more sensitive to borrowing rates which makes borrowers more credit worthy and most of borrowers credit worthiness accounted for in risk premiums. Banking rating is not random or is strongly correlated with project expected profitability. There is precise rating and risk notation.

If this elasticity decreases this means that as risk premiums increase, NPLs are less sensitive to borrowing rates which makes borrowers less credit worthy and most borrowers credit worthiness not accounted for in risk premiums. Banking rating is random or weakly correlated with project expected profitability. There is a bad rating and risk notation.

Our method consists in taking borrowers credit worthiness into account from a banking sector perspective for the scope of enhancing credit sector resilience to systemic risk and financial instability.

In doing this, based on a sensitivity analysis approach, we try to interpret the sensitivity of Non performing loans to the average cost of borrowing and find out it is a fairly performing benchmark on the seriousness of the borrowers in terms of predisposition to refund the loan.

It is based on the reference in the literature about the qualification of the sensitivity of borrowers to high borrowing rates according to which borrowers should not accept high borrowing rates if not they are not willing to refund the loan.

The elasticity of non performing loans to loan rates represents an expression of the sensitivity of NPLs to loan rate increases.

It is an expression of the quality of investors selection with respect to the average cost of borrowing.

As a matter of fact, If investors are more sensitive in NPLs to increases in loan rates they are good quality investors meaning that they are not likely to incur higher borrowing costs and neglect the likelihood of non repaying their loans.

The stake of risk entailed by their financed project is accurately taken into account by the risk premium.

If investors are less sensitive in NPLs to increases in loan rates they are deemed to be bad quality investors meaning that they are likely to incur higher borrowing costs and neglect the likelihood of non repaying their loans.

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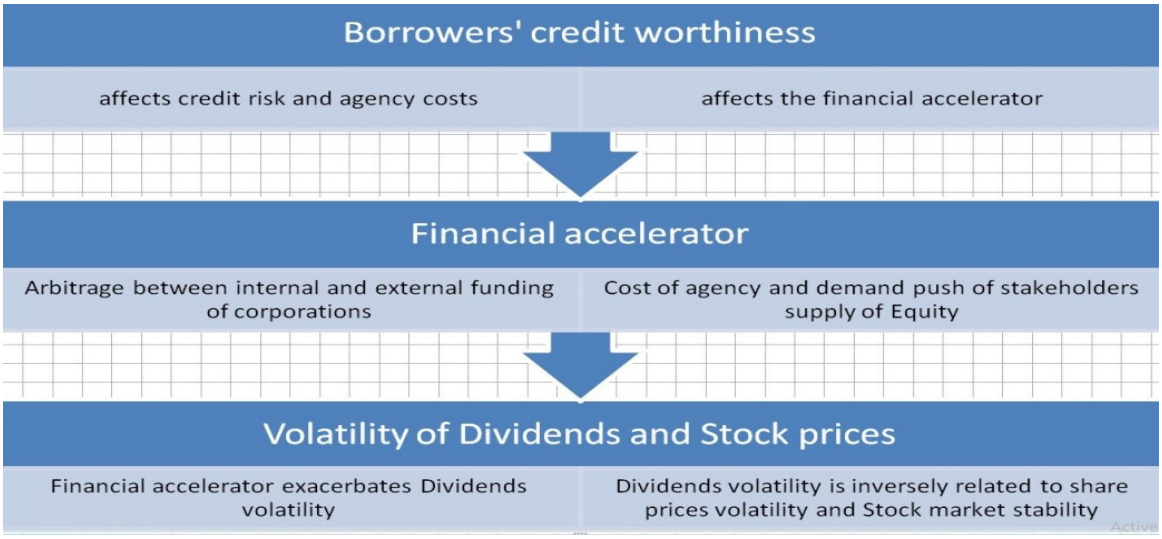
The stake of risk entailed by their financed project is not accurately taken into account by the risk premium. Because of adverse selection borrowers have the tendency not repay their loans whenever borrowing rates increases do not affect their expected ability to repay the loans.

The more NPLs are elastic to borrowing rates or risk premiums the more investors are good quality investors.

This method is prospective in that it is geared toward future assessment to be valid for expectations about the impact on financial stability in the future. It is not based on historical assessments bearing information assymetries such as free riding by taking future qualifications based on past assessments although it is based on time series regressions forecasts take actual and future determinants into account in the equations.

Chart 1 : Volatility of Dividends and stock prices and the financial accelerator :



INTERPRETATION

This graphic representation shows the linkages between credit sector key items of prominent relevance for credit market financial stability and key factors of prominent relevance for the Stock market financial stability which is volatility of dividends of Stock prices that according to the CAPM is inversely proportional to the volatility of share prices.

4.2 The Super-Multiplier:

J R Hicks (1950) has interacted both the multiplier effect of Keynes and the accelerator effect of Aftalian with a view of measuring the total effect of induced investment on income.

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The combined effect of multiplier that works converse to crowding out and accelerator is the so-called leverage effect or the super-multiplier effect.

P A Samuelson (1939) in his article about the interaction between the multiplier and the principal of acceleration and J R Hicks later in (1950) have made successful attempts to integrate the two concepts of financial acceleration and Keynesian multiplier which works converse to our crowding out effect matter and thus introduced remarkable improvements in the theory of economic growth.

They stated it is important to analyze the combined effects or leverage effect or super-multiplier effect on national income propagation.

The combination of autonomous and induced investment is a better expression of this super-multiplier as stated by Hansen.

The relevance of the super-multiplier to prudential matters stems from the fact that it draws a wedge between financial instability as portrayed by excess volatility of stock prices and macroeconomic performance that affects companies net worth and reverses back to the matter of prudentiality through the leverage effect and the tradeoff of equity financing and external borrowing.

As far as this arbitrage between various sources of financing for corporations is concerned the banking sector liquidity and credit risk features are quite intricating with respect to the setting of the cost of borrowing for corporations.

Thus all these aspects of financial accelerator super-multiplier and market risk are commingled to feed back into excess stock prices volatility and fuel financial instability and the requirement of limiting it through prudential intervention either in the credit sector or the Stock market sector .

4.3. The Balanced Scorecard 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).

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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.

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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.

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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 corporation’s 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.

beyond.

5. EARLY WARNING SYSTEMS, LONG RUN PRUDENTIAL SURVEILLANCE AND MARKOV SWITCHING REGIMES

The process is as follows:

Ensuring a stable income stream is a priority for banks maintains resilience from the onslaught of liquidity risk that triggers credit risk.

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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

5.1 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).

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Table 2: Approaches to supervisory risk assessment and early warning systems – generic features

	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

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.

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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.

5.2 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 ».

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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 is 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.

5.3 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.

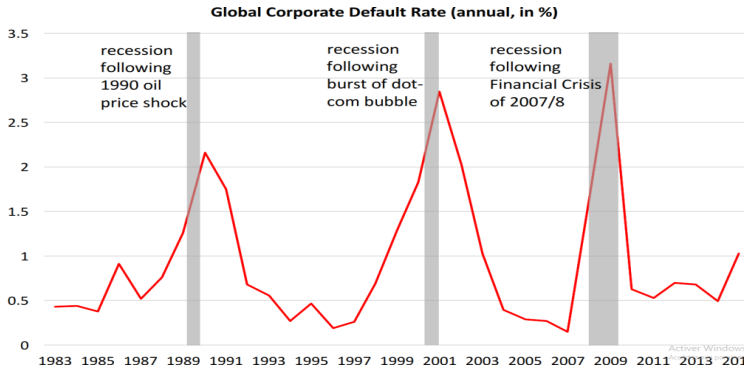
This procedure aims at drawing patterns for risk items that overlap and reproduce in order to better shape early warning.

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.

6. NON-PERFORMING LOANS, INFORMATION ASSYMETRIES AND BORROWERS CREDIT WORTHINESS EFFECTS ON PRUDENTIALITY AND RISK

6.1-NPLs EFFECTS ON STOCK MARKET VOLATILITY:



Transmission of credit market anomalies to stock market anomalies

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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.

6.2 Effects of Information Asymmetries 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 this 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.

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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.

6.3-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.

6.4-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

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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 exacerbationg 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.

7. HEDGING AND PRUDENTIALITY: AN APPRAISAL

7.1. The Importance of Hedging

In terms of integration must of portraying a prudential scheme and rendering interaction across financial sectors permissible, the stock market sector presents the specificity of encompassing a stock options feature that compromises the purview of the true scope of the key market risk fundamental which is volatility on which we based our fundamental justification of market risk and that does not hold in this instance.

According to Sajjad and Zamman: “Derivatives enable firms to hedge against systemic risks”.

As long as prudential surveillance is related to systemic risk mitigation, it follows that hedging does play a prudential role of hedging against systemic risks and financial instability as much as prudential instru-ments like the ones displayed in the framework of the engineering we proceeded to in this article.

Indeed, as long as stock options cancel any possibility of loss, excess volatility does no longer imply necessarily as a main cause for market risk and instability.

The basic framework set so far does no longer hold and requires further extensions concerning either the concepts of efficiency or stability which reveal a compromising further purview in terms of prudential surveillance instruments engineering.

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

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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.

According to Ingo Fender (2000), « Derivatives enable their users to separate value and transfer market risks. Risks are securitized and thus gain fungibility which in turn allows the unbundling and repackaging of market risks embodied in underlying assets. The use of derivatives therefore enhances the possibilities for active corporate risk management which is likely to have an impact on macroeconomic and monetary issues ».

The threat from derivatives to stock market stability comes from the financial accelerator. Indeed, by hedging interest rates, the wedge between internal and external financing for corporations vanishes. Therefore, equity becomes less necessary. Hence, stakeholders exert less power and become by a way of consequence less sensitive to projects outcomes. Therefore, dividends are less volatile and so are stock prices, what proves that derivatives are a main cause for stock market stability.

By ensuring more stability they compromise efficiency.

Therefore, there are two opponent views on the way derivatives affect stock market stability.

Information asymmetries and the skepticism about Modigliani's theory raises a concern about how far the credit channel of transmission of monetary policy does affects stock prices volatility.

7.2. The Prudential Role Played By Hedging

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

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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.

7.3 Hedging and Borrowers Credit Worthiness

Hedging is about a financial stategy 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 i twill 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

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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.

7.4 Hedging and the Balanced Score Card

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.

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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.

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8. CONCLUSION

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 fra;ework and the alternative solutions to annihilate its drawbacks the risk formulation dras 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

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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.

REFERENCES

Frei Cristoph (2017), Modeling credit risk and loan portfolio in the presence of autocorrelation UBS University of Alberta

Yue Yu and Pavel Loskot (2022), Polynomial distributions and transformations ZJU-UIUC Institute Haining China

Yuhong Sheng and Kai Yoo (2014), Some formulas of variance of uncertain random variables, Journal of uncertainty analysis and applications

Adrian T and Rosenberg J (2008), Stock returns and volatility: pricing the short run and long run components of market risk, The journal of Finance V 63

Agrawal Shreya, Sangeetha R, (2019), The impact of macroeconomic determinants on the performance of the Indian Stock Market, International Journal of Business and Management invention, Volume 8 Issue 3 Series V pp 16-23

Stiglitz E. Joseph (1982) The inefficiency of the Stock Market Equili-brium, Review of Economic Studies (1982) XLIX, pp 241-261 Princeton University

Alla Chalova, Elena Gromova and Elena Voronkova (2019), Integration of the financial market sectors: Factors, Risks and management approach, International journal of mechanical engineering and technology pp 1243-1250

Ray Ball (2000) What do we know about stock market efficiency? Ma-nagerial economics research letters at the university of Rochester USA

Tak Kuen Siu (2010) A Markov regime-switching marked point process for short rate analysis with credit risk Department of actuarial studies, Faculty of business and economics, Macquire University Sydney NSW 2190 australia International journal of Stockastic analysis Volume 2010 Article ID 870516

Kim Tae Yun, Do Kyong and Son suh (2009) Stock market stability index: An intelligent approach,

Received: 06.01.2024 *Accepted: 07.08.2025* *Published:29.08.2025*

Intelligent data analysis, DOI 10-3235 pp 983-993

Sajjad F, Noreen V and Zaman K (2013), Imapct of derivatives on financial services sector and risk management, Middle east journal of scientific research ISSN 1990-9233

Rolf J Daxhammer and Jonathan Kappler (2016), The examination of a profitabilitybased four factor model to explain stock returns: Empirical evidence from the German Stock market, ESB Business School Reutlinger University

Goerge Akerlof (1970), the market of lemons, the quarterly journal of economics vol 84 pp 488-500

Stiglitz J and Weiss A (1981) Credit rationing in markets with imperfect information, The american economic review V 71 pp 393-410

Dell'Aricca G (2001) Asymmetric information and the structure of the banking industry, European economic review, V 45 pp 1957-1980

Lynn Aylward and Rupert Thorne (1998) Countries' repayment performance vis-à-vis the IMF, IMF staff papers a quarterly journal of the IMF V 45

Mishkin FS (1998) The economics of money Banking and financial markets, Editor : Addison Wesley Boston

Dell'Arricia (1998) Assymetric information and the structure of the banking industry, IMF working paper International Monetary Fund WP/98/92

Agrawal Shreya, Sangeetha R, March (2019), The impact of macroeconomic determi-nants on the performance of the Indian Stock Market, International Journal of Business and Management invention, Volume 8 Issue 3 Series V pp 16-23

Baker M and Wungler J (2006), Investor sentiment and the cross-section of stock re-turns, The journal of finance volume 6 Issue 4 Pages 1645 to 1680

Ball Ray What do we know about stock market efficiency ? Managerial economics re-search center at the university of Rockester and the John M Olin foundation

Dimson Elroy, Mussavian Massoud, March (1998), A brief history of market efficiency, European financial management, Vol 4, N 01 pp 91-193

Fei Wu, Dayong Zhang and Zhiwei Zhang (2018) Systemic risks and spillovers in the stock market of China : a sectoral analysis, Research institute of economics and management Southern universtity of finance and economics China.

Fortin Michel, Khoury Nabil T (1988), Effectiveness of hedging interest rates risks and stock

Received: 06.01.2024 Accepted: 07.08.2025 Published:29.08.2025

market risks with financial fultures, The journal of futures markets Vol 8 N 3 pp 319-334

Gurcharan Singh and Salony Kansal (2010), Impact of derivatives trading on stock market volatility during pre and post Fand O period : A case study of NSE, School of management studies Punjabi university Patiala Volue 1 No 1

Joseph Stiglitz (1982), the inefficiency of the stock market equilibrium, Review of economic studies XLIX, pp 241-261

Malcolm Baker and Jeffery Wurgler (2007), Investor sentiment in the stock market, Journal of economic perspectives, Volume 21, Number 2 pages 129-151.

Peter Haiss and Bernhard Sammer (2010), The impact of derivatives markets on financial integratuion risk and economic growth, Institute of international business Vienna University of economics and business presented at the Athenian policy fo-rum 10th biennial conference on regulatory responses to the financial crisis Frankfurt 28-31 july 2010

Roberto Casarin and Carmine Trecroci (2007), Business cycle and stock market vola-tilities are they related?, CEREMADE and department of economics Paris Dauphine Septemner 2007

Sahel Benjamin, Vesala Jukka (1999), Financial stability analysis using aggregated data, European Central Bank BIS papar N 01

Stiglitz E. Joseph (1982) The inefficiency of the Stock Market Equilibrium, Review of Economic Studies (1982) XLIX, pp 241-261 Princeton University

Genc (2012) Empirical estimation of elasticities and their use, Department of Economics University of Otago New Zealand

Banks J, R Bundell and A Lewbel (1997) Quadratic engel curves and consumer demand, Review of Economics and Statistics 79, 527-539

Board of Governers of the Federal Reserve System (2023) The FEDERAL RESERVE BANK

Abdali Seja (2013), Toward a conceptual framework for integrating enterprises performance and risk management, Journal of Management research ISSN 1941-899x 2013 vol1 N 04

Beasley, Chen Nunez and Wright (2006), Working hand in hand : Balanced scorecard and enterprise rsk management Annual conference topic: Strategic finance and Risk management

Gordon, Loeba and Tseng (2009), Enterprise risk management and firm performance : a contingency perspective, Journal of accounting and public policy Elsevier vol 28 p 301-327

Sahajwala and Bergh (2000), Supervisory risk assessment and early warning systems, Basel committee on banking supervision working papers

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DISCLOSURE OF CONFLICT

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