

**WHITE PAPER**  
**RISK MANAGEMENT**



**INSIDE THE**  
**VOLATILITY**  
**ZONE**

**THE PLAN FOR SUCCESS**

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## EXECUTIVE SUMMARY

This paper is speaking to the Middle Office function, controlling Market Risk in an Investment Bank, particularly of the first tier. Analogously then It speaks to the similar function in Asset Management or Life Assurance, it is concerned with issues of compliance and transparency in particular Basel III, IFRS7 and Solvency 2.

Financial institutions are facing a new paradigm in terms of effective market risk management, compliant capital management and full regulatory compliance with the keystones of Basel III, IFRS and a range of new compliance norms from international regulatory authorities. In the context of what has been an unprecedented period of market volatility since 2008, institutional re-capitalisation, liquidity shortfalls, state interventions and punitive response proposals for increased taxation, Glass Steagall type separations and high capital reserve ratios to finance vast regional rescue fund safety nets; it is time to ask the question whether this approach to a solution is optimal for the forward prosperity and health of the Tier 1 investment banking & asset management sector.



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In a market risk legacy technology environment which has systematically failed to deliver information visibility levels capable of keeping pace with the new velocity, volume, volatility and complexity of international capital markets; this paper addresses viable alternate solutions available within reach of the latest generation of ultra fast tactical advanced risk modelling and reporting technologies and

presents a coherent alternative eliminating or significantly reducing the need for the drastic measures currently under discussion.

We consider that the full implementation of the current proposals would be vastly deleterious to the sector and the economies in which they generate employment, revenue and prestige. This paper reviews from a technological perspective how risk management, transparency, capital management and full regulatory compliance may be achieved on existing legacy technology environments in a cost efficient manner without core system renewal. Further we consider how the same technology may serve to reduce significantly augmented capital reserve demands to improve liquidity and reduce the need for the creation of such elevated safety nets of emergency capital to provide for potential systemic failure.

Siag as risk management consultants to leading Tier 1 asset management organisations believe strongly in a full and exhaustive modelling of VaR variants, Value at Earnings (VaE) and P&L vectors, with extensive what if scenarios, stress testing and back testing to full portfolio risk adjusted valuation with the highest degree of confidence over a given temporal horizon which it is currently possible to achieve. It is only possible to achieve this degree of accuracy and confidence by considering a full range of risk models taken in conjunction, as any one risk measure in itself cannot be considered to be a reliable indicator of risk exposure. New forms of VaR such as the stressed VaR required under Basel demand that any Tier 1 market risk management system must have the ability to incorporate new measures and metrics as may be required operationally or demanded by regulators for effective risk analysis.

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<sup>1</sup> <http://www.siaq-management.com/>

At a time when regulators under B3 are requiring a significant increase to core capital irrespective of the nature and volatility of the asset classes under management and their associated risk profiles, it becomes even more critical for a Tier 1 institution to have access to accurate risk adjusted asset valuations in a timely manner to efficiently manage capital. Unless asset valuations are correctly valued and adjusted for risk in the balance sheet, core capital reserves will be either insufficient, thus representing liquidity or solvency risk, or excessive thus debilitating the competitive position of the institution concerned. Clearly; neither of these positions are in any way desirable and the former may also be non compliant risking regulatory sanction under the stricter risk management, audit and capital provision regulations. These will be applied in Europe under the new pan European control agency which has been announced from January 2011 and is proposed to be the most rigorous control agency globally, and also in the USA from the SEC which both include compliance with the audit norms of the IASB with IFRS.



<sup>2</sup>

**Brussels & Madrid,  
October 2010**

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<sup>2</sup> <http://www.asymptotix.eu/>

### BACKGROUND

It is almost banal to state now that during the last two years, those of us who contribute to the international Investment Banking and Asset Management sectors; whether regulator, asset manager, consultant, thought leader, technology developer or indeed government or central bank have been living in quite unprecedented times. What is emerging as the dust settles on a renewed and strengthened regulatory and reporting panorama? Here is a summary sketch; restructuring of liquidity in many leading institutions, revised norms for risk adjusted asset valuations, balance sheet sanitisation, and increased reserve capital ratio requirements under Basel III. This scenario is causing a fundamental root and branch rethink about the management of this economically pivotal sector, in a standards compliant manner; going forward. The old guard, harrumphing from the sidelines in the old clichés about “good for banking” look more and more irrelevant. “The window is open” and a cold breeze of transparency is blowing in, upon the arcane world of asset valuations and risk pricing in our world. The new philosophies of ‘sustainability’, ‘do more with less’ and yes indeed, ‘fairness’ are no longer on a separate and parallel track to the world of banking and asset management.

As a Doctor considers the needs of an ailing patient<sup>3</sup> prescribing the correct treatment by addressing properly the cause and not the symptoms; the initial international trauma response via massive state interventions has been an extraordinary coordinated management feat, certainly not perfect; but effective so far. However, as the patient remains on the table, in life support, in the post global shock aftermath, are we are now in danger of throwing the baby out with the

bathwater? Mixing a metaphor or two, I know but you get the picture.

**In the context of the massive macro ‘emergency room’ rescue activity, what is it at the micro level that the individual institution has to do; not only to achieve compliance, but also been seen to achieve compliance in order to assure that this rescue mission is sustainable?**

It is superfluous to revisit the well known causes of the patient’s condition; however it is most relevant to consider the surgical intervention and more relevantly the rehabilitation procedures that are suggested by the “crash team” to ensure a full recovery to health. The critical nature of the “victims” condition was amply demonstrated by 750 million USD in TARP funds, Hundreds of millions across Europe in government and central bank interventions, €500 billion in balance sheet asset write downs in 2009 alone in Europe as an interim account and a new emergency fund of €950 billion held in Europe at central level should any more cardiac massage be required in the future.

So; as we have agreed that the patient was very sick indeed, and that the initial intervention was correct from the consultant surgeons, we should now examine a little more closely, how it is proposed that forward care is delivered.

We start at an economic level with the premise that most developed economies have the conflicting drivers of low growth, low consumer demand making a consumer led recovery dubious, over leveraging of consumer credit levels, high unemployment with the relative costs and reduction in treasury income, and most importantly massive public sector deficits and growth / GDP leveraging at levels which have no historical precedent.

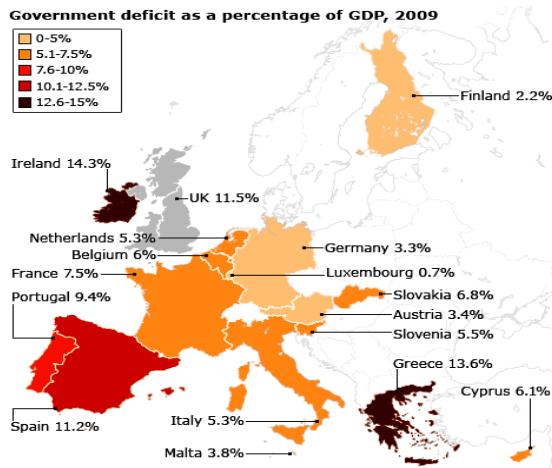
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<sup>3</sup> [Risk Management: A Differential Diagnosis](#)



## CONTEXT

These European fiscal deficits now risk economic contraction resultant from the necessary public expenditure reductions being implemented by most governments & are further applying pressure to growth, treasury reserves and liquidity. For these reasons, full implementation of the raised capital reserve requirements under Basel III have been phased to be fully completed by 2019 in order not to further shock a still fragile system.

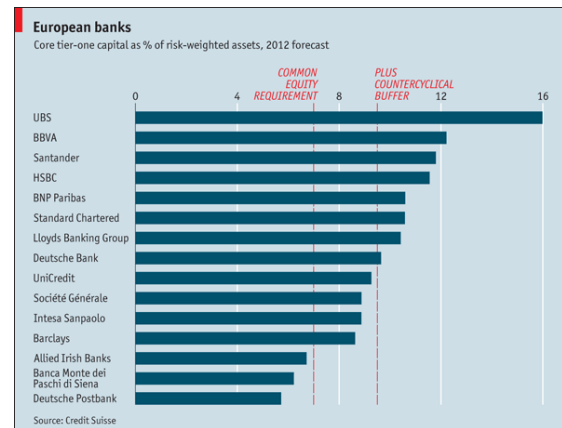


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Whilst the required ratios vary across the risk profile of asset classes, the average requirement for reserve capital under Basel III compliance will now be around 7%. In the view of the Economist, this will actually represent an impact of 10%, given the 2.5%

<sup>4</sup> SOURCE: BBC

counter cyclical buffer which may be applied when regulators consider it necessary. When taken in conjunction with a €950 billion safety net in a common EU pool; clearly the authorities consider that there is a significant risk of a repeat of this situation in the future, obliging both Tier 1 institutions and Central Banks to prepare for it in the manner indicated.



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Reading between the lines it becomes clear that it is potentially the inadequate management of risk and inadequate reserves to cover probable risk exposure, which underpins the belief that it will take until 2019 to adequately cover this risk exposure known to be present. It is this fact which requires the establishment of a €950 billion safety net rescue fund for when the inevitable occurs which is at the root of these belt and braces, wing and a prayer safety measures. One only requires such Draconian safety measures in order to provide for known risk if it is also known that one does not know what this risk is and cannot measure it, and even if one did, one does not have the reserves with which to cover the downside liability. Manifestly the underlying issue, the latent variable in this equation is transparency<sup>6</sup>.

<sup>5</sup> SOURCE: THE ECONOMIST

<sup>6</sup> [Solving for Basel II and IFRS7 with SIAG](#)

Nonetheless; we must now consider the second Draconian area of proposed institutional changes being considered at the macro level. The proposition to break up the financial institutions into Casinos and Utilities as the simple strap line has it. This again does seem to rather miss the point in terms of coherent forward steps to better prevent further devastation to global economic health, liquidity and resilience.

As has been seen by the movement of operational emphasis to the Asian markets by both Wall Street and City banks in preparation for the imposition of this damaging requirement, institutions will not remove themselves from this vital market; they will simply relocate. They will move shop to where they are welcome and allowed to conduct business operations with the corresponding devastating effects upon employment, taxation and revenue, and the loss of all international prestige of the centres affected by such disastrous and ill conceived legislation. It is entirely analogous to telling the patient to go to another hospital for care, rather than rehabilitating them in the same one where emergency treatment was delivered at huge public cost. Is the intention to regulate and control effectively, or compulsorily displace some of the world's leading institutions and fiscal contributors? If the real intention is the former then the solution is most definitely not the latter.

Glass Steagall would only be required as a desperate last ditch emergency measure where there is inadequate market risk management with poor compliance without the reserve capital to support market risk exposure and market volatility. This clearly does represent a serious systemic risk through aggregated portfolio risk exposure, amplified by counterparty liability exposure in volatile markets thus driving interbank lending. As we have seen the endgame occurs if there is not full risk transparency,

correct asset valuations adjusted for risk and therefore an accurate balance sheet. Capital reserve adequacy and regulatory compliance must stem from the starting point of a correct risk adjusted balance sheet. We are far from this position today in many institutions as seen by the raft of recapitalisations<sup>7</sup> when faced with Basel III<sup>8</sup> implementation under the "broadsword" of a new EU regulatory agency.

## RESPONSE

Both these ill advised and massively damaging corrective measures clearly illustrate both a failure to plan and a plan for failure. This is not a coherent strategic plan given the available options. What is required is proper dynamic active market risk management based upon risk adjusted sanitised balance sheets and asset valuations forming the basis of sensible proportional risk adjusted capital buffers which diligent management of market risk indicates are necessary for full compliance. This is to plan for success in a responsible and coherent manner which neither kills the wealth generator which is this vital sector, nor places it at a competitive disadvantage in a globalised market.

It removes the need for rescue funds, Glass Steagall and elevated levels of reserve capital as capital reserve ratios are based upon risk adjusted asset valuations and therefore market risk is measured, known and capital reserves proportional to actual risk. It is unrealistic to standardise a reserve capital ratio given that portfolio compositions in terms of both asset allocation and the risk related to the assets under management vary vastly dependant on the risk appetite of the institution and the volatility of the market. One size does not fit all clearly so it is by definition a sub optimal

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<sup>7</sup> [Why is Deutsche Bank Raising Capital Now?](#)

<sup>8</sup> [Minimum Capital Standards Basel III](#)

management solution. Capital reserve ratios must relate proportionally to actual risk in any portfolio, and this can only be calculated by risk adjusted valuations of the actual asset classes under management. There is no other sensible alternative.



Europe has decided upon centralised supervisory agencies from January next year in the Barnier<sup>9</sup> / Trichet initiative. The mandate is to coordinate the activities of regulation, supervision and control. Much has been spoken of “radars” and “control towers” to ensure that market risk is correctly managed and that compliance with all regulatory norms from Basel III to IFRS are respected and enforced. These new agencies will have the authority to overrule national supervisory agencies in a pan European super agency with local agencies reporting to it. Jean Claude Trichet, President of the European Central Bank, hailed the move as “a very important step forward” while Michel Barnier, the Commissioner in charge of the EU's regulatory overhaul, said the agencies could be a role model for the world. “Europe is the first region in the world to put in place top-notch supervision,” said Jose Manuel Barroso, the President of the European Commission or executive.

Experts hailed the creation of the super-watchdogs as historic. “Brussels is like a super tanker. Once it's on course, it will be firm,” said Karel

Lannoo of the Center for European Policy Studies.

*“The new authorities are part of the EU machinery. This ultimately gives the European Commission direct control over financial supervisors.”<sup>10</sup>*

However referring to the need for European harmonisation with US changes in regulation in Dodds Frank initially, Jean-Claude Trichet, President of the European Central Bank, said “the agreements reached are a fundamental strengthening of global capital standards.” He added that “their contribution to long term financial stability and growth will be substantial. The transition arrangements will enable banks to meet the new standards while supporting the economic recovery.”

But there's a catch, the European Parliament's Economic Affairs Committee pointed out;

*“Recently-passed laws in the U.S. could lead to serious inequalities in the implementation of the current Basel standards and those agreed upon this week, due inter alia to limits on the recognition of external rating agencies and to the fact that the standards are to apply only to certain types of banks....The resolution calls on the Commission to look into this matter due to concerns about the lack of a global level playing field.”<sup>11</sup>*

This again returns to the earlier point of the sensible need for the harmonisation of standards and a coherent approach to the implementation of appropriate measures which will meet the core objective of stability, compliance, accurate reporting and core capital adequacy which are not achieved via emergency rescue funds, taxation or

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<sup>9</sup> [European Banking Authority Based In London](#)

<sup>10</sup> [EU to set up new financial watchdogs](#)

<sup>11</sup> [Capital requirements: much work still to be done on new Basel standards](#)

Glass Steagall. From January 2011 these new agencies and control measures will be implemented on a European wide basis. Compliance will therefore be required to the new standards and enforced by both central and national agencies which headline structure has now been formally ratified and announced. Full compliance must therefore by definition be an urgent 2011 priority for all European financial institutions.

### THE PLAN FOR SUCCESS

So this being the case is there really any better alternative to Glass Steagall, Taxation, Rescue Funds and highly leveraged capital reserve ratios?

Yes; as asymptotix and Siag have been pointing out for some considerable time. The definitive solution relates directly to the ultra fast ("on-demand") enterprise risk management appliance as a functional aspect of a validated data management environment. This appliance provides the ability to properly model and manage market risk, correctly value assets according to their fully stressed risk profile; properly analysed. It also facilitates the enterprise the ability to calculate and allocate reserve capital based upon correct aggregated portfolio risk and thus adjusted asset valuations on a daily basis. It is this precise topic that Siag have been working alongside asymptotix to resolve for the last 2 years.

There are 3 core issues that we must consider in order for this new paradigm to become a reality and permit the active and effective management of market risk in relation to core reserve capital in a Tier 1 financial institution;-

- Validated compliant base data.
- Full risk aggregated modelling and analysis, stress tested and back tested to full portfolio risk adjusted revaluation as at T-1 EOD closing positions prior to markets reopening T-0.
- The ability to analyse this risk information and allocate the reserve capital buffers accordingly and decide on position changes which reflect actual portfolio risk exposure T-1 before making further trading decisions T-0.

It is only through these measures that intraday risk is limited to T-0 activity from a secured base point T-1 at which point risk exposure was known and capital buffers allocated against this risk. The probability of a Lehman like slide into insolvency over a single weekend is thus eliminated as however volatile the markets may be, during T-0 trading activity capital reserves are adequate in accordance with the actual portfolio positions and the asset classes which comprise the portfolio; which as we have covered will be different in each case. It is unreasonable to demand of a portfolio manager largely trading in fixed income instruments, to cover the same degree of downside risk potential as one who may be trading predominantly in derivatives and other high risk investments such as ABS, CDS, Options and Futures, or weapons of mass destruction as they were described by Mr Warren Buffett. The only sensible method of calculating and allocating reserve ratios must be to base these directly upon the class of assets managed and traded, the risk appetite of the institution and the

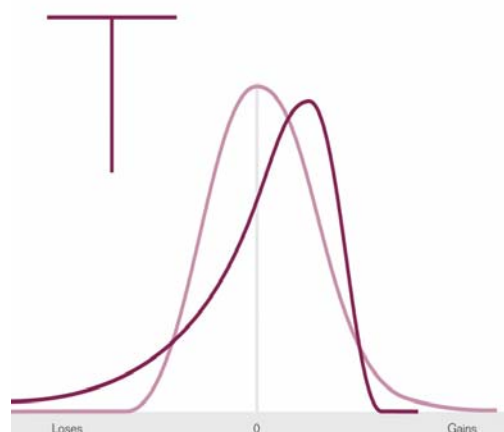
composition of the portfolio under management within established risk limits and protocols.

This avoids the catch all of all asset managers being pigeon holed into some generic stereotypical risk profile, which by their very nature does not reflect the situation in real life. The higher the risk and volatility in the classes of assets under management, the higher the reserve capital ratios need to be. The longer it is since this risk modelled information was updated to reflect actual positions; the higher the risk rises exponentially and therefore the higher the capital buffers must be in order to cover actual exposure to risk. This is another way of saying, that given market volatility it is impossible to establish what the correct limits and ratios should be and set them correctly.

It is entirely analogous to motor insurance. The higher the performance of the vehicle, its speed, and the risks associated with both the vehicle and its driver, the higher the premia to cover the increased probability of a higher cost claim.

We do not average out the risk and charge the 25 year old who drives like Stig Blomqvist<sup>12</sup>, the same as we charge a 'little old lady' senior citizen who has been driving all their life in a micro-car. The actual risk, and therefore the required capital buffer to cover risk exposure must relate entirely to the circumstances of the portfolio and its exposure to market volatility and probability of loss or VaR.

## VALUE at RISK



Value @ Risk is the measure of risk exposure and this is contained within Basel Banking regulations rendering pointless debates about the effectiveness of VaR when faced with a Caleb Black Swan utterly irrelevant in terms of correct compliance. Can VaR protect against any extreme set of once in a lifetime circumstances which could hypothetically arise? No. Neither can anything else either as risk is inherent to asset management which is precisely why it must be measured, controlled and managed in compliance with the regulations in force. What Risk can do if fully modelled, analysed and interpreted correctly is provide through an analysis of historic data, actual data and forward modelling the probability of losses to a given degree of confidence over a given temporal horizon, you could argue that is what Risk actually is.

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<sup>12</sup> [http://en.wikipedia.org/wiki/Stig\\_Blomqvist](http://en.wikipedia.org/wiki/Stig_Blomqvist)

A comprehensive daily VaR analysis which is stress tested to a full revaluation is an extremely accurate form of measuring risk exposure (in trading portfolios). This is precisely why its use and analysis is compulsory in Basel International Banking Regulations.

So; why is this need causing so many asset managers and Middle Office executives so many complications in the correct calculation of VaR, and therefore their ability to model, stress test and analyse VaR and accordingly manage their risk exposure and the reserve capital necessary to cover the risk?

There are two factors which are impeding the effective management of this situation; both of which can be technologically addressed and fully corrected without core system renewal.

**1)** The dreadfully slow process of 10 – 30 hour overnight batch processes in order to calculate the T-1 risk adjusted asset valuations associated with all legacy system technology incapable of performing this modelling and analysis any faster.

**2)** The speed of market volatility and the risks of exposure in what we have defined and termed the “Volatility Zone” where the Middle Office is completely exposed to unprecedented market volatility and entirely blind to their risk exposure and therefore their capital requirements to cover this exposure.

To resolve these issues technologically is to significantly reduce intraday market risk volatility exposure, provide capital adequacy for intra day operations, and minimise the level of reserve capital which is actually required to be held.

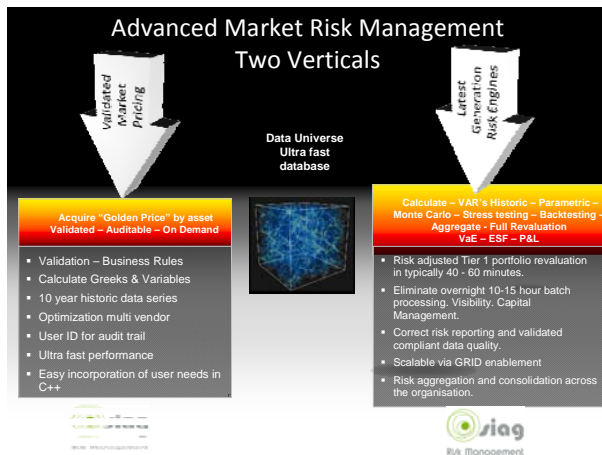
**Therefore this logical and compliant process permits the allocation of safe capital levels based upon actual T-1 portfolio exposure and not an unquantifiable provision of “should be enough – we hope”.**

This also reduces the need for so great a reserve emergency fund and would not cause banks to tie up required capital to cover risks at a level far in excess of their actual portfolio risk levels. Since risks and asset valuations have been properly calculated in relation to reserve capital this therefore also places more liquidity at the disposal of Middle Office management. At a macro level this is in fact what all governments and economies so affected are requesting. If all asset managers are complying with this technological standard, and measuring and covering risk on a daily basis then equally; the systemic risk within the interconnected symbiosis of the financial system is also significantly reduced. It is only blindness to risk and inadequate capital provision against modelled risk which is causing the authorities to introduce such Draconian measures.

Reduce the risk through swifter calculation and consequently increase transparency and you reduce the provision to cover risk. Risk is ‘idiosyncratic’ i.e. it is inherently different for each financial institution; a function of their risk appetite and portfolio composition.

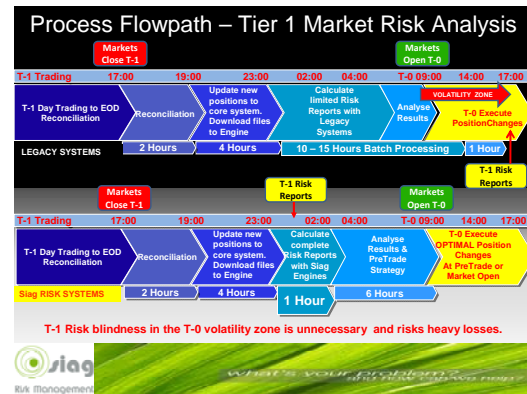
Adopting an approach which is asset and portfolio specific; allocating capital reserves to actual risk exposure in an “On Demand”<sup>13</sup> manner and not a catch all; generic & inflexible “one size fits all” blunt instrument is obviously the strategy which is the answer to current problems

Guesstimate provisioning frankly makes little sense and would be very difficult to enforce in Tier 2 & 3 – type portfolios, given the relative number of funds and total available resources. It is however the Tier 1 institutions which comprise the significant majority of systemic risk as the failure of any one small fund would not have catastrophic systemic implications.



## THE VOLATILITY ZONE<sup>14</sup>

As we see clearly defined in this graphic, the volatility zone exists T-0 for however long it may be until the T-1 position risk reports have been fully modelled and analysed in a multi hour/day batch process of typically 10 – 30 hours post reconciliation T-1.



To fully understand the precise nature of the technological challenge presented by the much needed elimination of batch processing for correct compliance and capital management it is necessary to first consider the actual process from the close of markets to the production of T-1 risk adjusted asset valuations and how this causes the volatility zone to be created. It is self evident that the primary factor causing volatility zone risk blindness, conservatively shown at 10-15 hours as it is frequently double this time, is the time taken for the batch processing element of this key process to update positing information to core systems and the downloading times for updated position data to risk modelling engines.

<sup>14</sup> Definition: The indefinite amount of time between the reconciliation of T-1 closing positions to the availability of the aggregated modelled and stressed risk adjusted consolidated asset positions and valuations prior to the re-commencement of trading T-0 or T+1, and the allocation of reserve capital sufficient to cover the VaR adjusted aggregated T-1 portfolio risk exposure of these positions to a given degree of confidence within a given temporal horizon.

<sup>13</sup> [The On Demand operating environment \(IBM\)](#)

This has nothing whatsoever to do with any form of data slicing and dicing and analytics post the receipt of the eventual batch report from the overnight calculation and modelling process. However thorough this analysis may be; it cannot commence until what ever risk engine may be “aboard”<sup>15</sup> the core legacy system has finally managed to crank out a portfolio level risk report and valuation from the T-1 reconciled positions. Until any asset manager has this information; they are most definitely at risk in the volatility zone, blind to their overall risk exposure and in no position to assess, allocate or make provision for the reserve capital which is required to cover the clear and present danger within the actual (latent, ‘unknown’) positions. This risk and corresponding capital requirement can only be made visible by a full modelling of all risk adjusted asset valuations and therefore the aggregated portfolio risk and therefore the reserve capital required to cover it.

Furthermore; neither can they assess their liquidity risk, nor advise investors correctly, nor manage their own asset portfolio compliantly nor correctly report the asset column of the balance sheet to regulators if they are unaware what their portfolio is actually worth adjusted for risk and therefore the capitalisation and reserve capital pertinent to their actual market positions.

Existing core legacy systems are unable to reduce this calculation and modelling time in such a way as to deliver Tier 1 portfolio T-1 risk visibility within a time period which would deliver portfolio revaluation and VaR reports at position and aggregated levels in time for risk positions and asset valuations to have been fully analysed and optimised trading decisions made before markets reopen T-0.

Therefore a different technology model is required which can within existing technology environments operate symbiotically with existing systems, yet deliver the performance enhancements which are urgently necessary. It is necessary to validate input data and ensure its quality, accuracy and compliance, it is necessary to have the ability to fully model risk within the portfolio and analyse fully modelled risk reports and individual and aggregated risk adjusted valuations for analysis and trading optimisation before the opening of markets T-0.

A semantic taxonomy of the causative factors of the Tier 1 volatility zone, (analogous to a vast black hole in T-0 Middle Office market risk visibility) and therefore diligent regulatory T-0 compliance, is entirely a function of the technological performance limitations of legacy systems architecture; speed capability when dealing with Tier 1 portfolio data volumes. This “blind spot” is almost now accepted as a given “worked around” operational norm and an inevitable “have to live with” technological shortcoming. This put simply is no longer the case.



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<sup>15</sup> ‘connected to’ / ‘applied to’ (metaphor)

This pandemic across a significant majority of the Tier 1 sector has been primarily perpetuated resultant from two factors:

**1)** Client operational dependence upon very expensive (in terms of acquisition and on-going costs) legacy data and technology environments which are mission critical. These systems require between 10 and 30 hours of costly overnight batch processing to model and stress a portfolio, perform in some cases limited portfolio risk modelling, and produce a report of the risk adjusted asset valuations from T-1 closing positions (@ t-0)<sup>16</sup>.

**2)** The disruption and costs associated with the replacement of core systems at a time of budget restriction and a focus on cost reduction and operational efficiency at a time of regulatory change and increased capital reserve ratio requirements for compliance with Basel III.

Tier 1 10 – 30 hour long batch processing dependence for risk data transparency in a technological and market environment where according to MIT when describing current electronic trading systems “3 milliseconds is an eternity”, is not only technologically incongruous, it is clearly causing significant risk blindness and an inability to ensure that capital reserves are adequate and directly proportional to actual risk. T-0 reserve capital must be adequate to cover the loss exposure which may be present in the T-1 EOD positions and this may only be assessed by having the fully modelled asset and portfolio risk adjusted valuations prior to trading T-0.

Two non compliant states exist directly resultant from this sub optimal inefficiency:

**1)** Risk adjusted asset valuations and therefore position and portfolio risk exposure are unknown when trading T-0 or T+1 in some cases thus rendering capital reserve management compliance absolutely impossible as the level of risk exposure and the probability of loss is unknown.

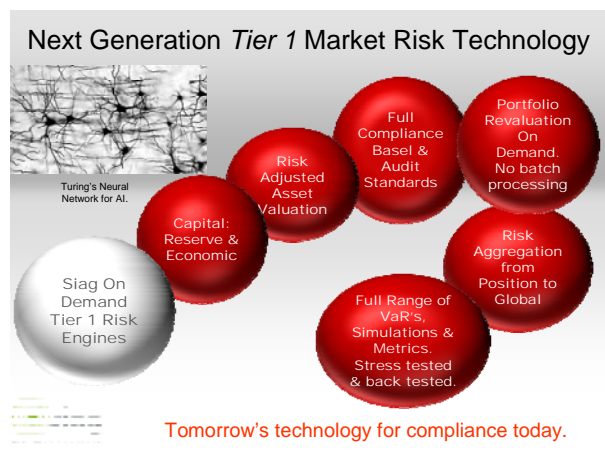
**2)** There is no time given this lengthy process to analyse the output data from risk engines and make tactical portfolio management (optimisation) decisions based upon modelled risk exposure; responding both to the probability of loss within the T-1 positions which are then exposed to further market volatility T-0 without the required risk visibility for both portfolio and capital management and therefore compliance.

It is therefore logical to conclude that full compliance with regard to Basel capital, risk management and audit compliance requires the elimination of unnecessary multi day batch processing thus producing the correct balance sheet declaration of accurate risk adjusted asset values and the correct management of capital provision to cover the probability of loss exposure as indicated by portfolio VaR modelling and stress testing as at T-1 positions. This information must be available for analysis prior to the commencement of T-0 trading and forms the basis of compliant and efficient regulatory capital management.

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<sup>16</sup> For simplicity of exposition – Ed.

It is our experience that this concerning reality is impacting on many clients in their strenuous efforts to achieve accurate reliable quality base data, efficient technology environments and full regulatory compliance.



## SOLUTION

A solution Architecture is, as SIAG and Asymptotix have been advising determinedly and coherently, now fully technologically possible to solve the "Volatility Zone" conundrum without the disruption of core system renewal which we understand is not an option for Tier 1 clients.



The effective solution to these challenges has been developed working in legacy environments with a correspondent understanding of the issues to be addressed and the technical complexities associated with any implementation of a coherent and effective solution. A viable solution must not demand total core system renewal and yet must satisfactorily resolve all of these risks and deficiencies in a technologically advanced and comprehensive manner within the existing client system landscape.

The solution to these issues has been developed combining a "golden"<sup>17</sup> data management layer predicated on defined business rules and audit trailed. This solution is harnessed to enterprise tactical risk management platforms. The solution principally consists of ultra fast Tier 1 volume risk modelling calculation engines which are scalable via GRID implementation to any required data volume. This produces on demand output performance.

This revolutionary advanced technology permits full modelling of risk adjusted asset valuations across an entire global portfolio at Tier 1 data volumes to fully stressed and tested revaluation within typically just an hour. Not only does this ensure the production of the required T-1 risk adjusted portfolio revaluation many hours or even days before batch processing would deliver only a part of this comprehensive modelling, it provides many hours of analysis time and strategic portfolio decision planning based upon the risk output reports prior to the recommencement of trading @ T-0.

This solution is available for international implementation, is cost effective against any comparable Tier 1 solution, is able to fully model a Tier 1 portfolio to fully modelled and stressed risk adjusted revaluation, and ensures validated input data to ensure the accuracy of output reports.

It is fully compliant with even the toughest of the new regulatory standards, sits alongside existing core systems as an enterprise appliance, and is programmed in full C++ with an open API, multiplatform SOA architecture and is fully scalable via GRID implementation to any portfolio.

<sup>17</sup> Super-validated

Any client valuation methodology may be applied to any asset class via a dynamic library mapping system allowing formulae to be changed and reassigned to asset classes, and via its complement Price Manager not only validates golden input data to full audit and business rules compliance, can even generate a synthetic historical data series for new assets requiring a synthesized historic VaR report.

Greeks and unobservable variables are calculated again to client preferred methodology standardising risk sensitive calculations to validated input market data, again with Tier 1 portfolio performance standards.

Siag operates through its partnership network in Europe, Asia and the USA. The Siag leadership team is aware that however advanced the Siag Risk Engine and Data Management environment, what really makes the difference to you our client is its people. Siag's partners are an extension of that. Only the most advanced technology delivered by the most experienced competent people can make the difference to your requirements in the 'Volatility Zone' and it is here that asymptotix stand alongside Siag – able to help. Asymptotix has deep domain expertise in this space and has assisted Siag in the shaping of the Solution Design of the product set described here. This partnership is available to assist you in the challenges addressed in the paper.



## CONCLUSION



Change is ultimately inevitable. It is driven in this case by technology such as electronic trading in millisecond arbitrage transactions, ever accelerating market complexity and diversification, the need for a competitive edge in a globalised and interconnected financial system and markets, as well as the need for regulatory compliance in an emergent consolidated landscape across global capital markets.

Hanging by the Balance Sheet – In The Tier 1 Volatility Zone

The diagram illustrates the relationship between market volatility and capital adequacy. It features a central circular flow with "INTRADAY" at the top, "Loss Exposure" with a downward arrow in the middle, and "Capital Reserves" with a downward arrow at the bottom. To the left, a diver is shown in a turbulent sea with a jagged line representing market volatility. To the right, a cityscape is shown with a clock indicating "Time Phased Risk Blindness T-0 24 hour Legacy Batch Processes".

Valuation Adjusted For Loss Probability	Risk Proportional Capital Adequacy
<ul style="list-style-type: none"><li>• Interday T-1 per asset and aggregated portfolio full VaR modelling based validated market and EOD position data.</li><li>• Minimum VaR analysis; Parametric, Historic 4 years series, Stressed (Basel), Monte Carlo (Derivs) – As at previous date (Audit)</li><li>• Stress testing to varied scenarios, Back testing, full aggregated T-1 risk adjusted asset &amp; portfolio valuation. COMPLIANCE.</li></ul>	<ul style="list-style-type: none"><li>• Proportional ratio to aggregated portfolio by composition mix &amp; asset class risk profile. Fixed Income, Equities, FX, Derivatives, Illiquid etc.</li><li>• Based Value at Risk (probability of losses to given probability over given time per asset).</li><li>• Measured daily T-1. Reserve capital based proportional intraday loss probability allocated before T-0 Volatility Zone exposure to further potential market losses.</li></ul>

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If ever definitive proof were required of the validity of the need for technology such as we present here, a brief analysis of the developments of the last three years and the current phasing of the implementation of Basel III capital requirements until 2019 another 9 years away, clearly indicate the overwhelming need for adequate risk management systems, the ability to correctly value assets adjusted for risk, the correct management of core capital within risk exposure and full regulatory compliance which is not an option; it is an obligation which will now be both enforced and audited with the corresponding sanctions for non compliance.

## REFERENCES

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David is the Director responsible for the international management of Siag Risk Management, the advanced ultra high performance Tier 1 risk technology development and risk management consulting organisation headquartered in Madrid. David's responsibilities include the management of Siag's international network of alliance partners, including Asymptotix, with whom he works closely alongside John Morrison on next generation system and methodology development.

#### John A Morrison

John is part of the asymptotix team and is committed to working with his fellow Directors; he is particularly focused on developing the 'trail blazing' thinking going on in partnership with asymptotix key partners. A Solution Architecture predicated upon the thinking of asymptotix and its partners will come sufficiently close to assuring that a crisis will never happen again as to be asymptotically perfect!