MSCI

10 October 2013

Submitted by email to baselcommittee@bis.org

Secretariat of the Basel Committee on Banking Supervision
Bank for International Settlements
CH-4002 Basel Switzerland

Re: MSCI comments on *The Regulatory Framework: Balancing Risk Sensitivity, Simplicity and Comparability*

To the Committee members:

We are pleased to offer these comments on the Basel Committee's recent Discussion Paper (DP), *The Regulatory Framework: Balancing Risk Sensitivity, Simplicity and Comparability*. The Discussion Paper is a reflection on the purposes of regulation generally and capital standards specifically, and on whether the multiple aims of current regulation are at odds with each other. The regulatory dialogue is often tense with implementation details, and a document such as this Discussion Paper is a refreshing and important opportunity to step away from the details and consider at a higher level what the future of regulation should be.

We have been an active participant in the dialogue between the industry and banking regulators, dating back to the initial discussions in 1994 on what became the 1996 Market Risk Amendment to the Basel Accord. At that time, JP Morgan had just released a public market risk methodology and dataset—known as RiskMetrics—in part to provide the industry and supervisors with a benchmark for internal market risk methodologies. This release was followed in 1997 by the CreditMetrics methodology to assess banking book capital, which in turn was an integral piece of the dialogue leading to the Basel II agreement. RiskMetrics Group spun off from JP Morgan in 1998, and was acquired by MSCI in 2010. The firm has continued to develop both risk methodologies and innovative services, both for internal risk management and for external risk disclosure and communication.

In our eyes, the most important step the Committee has taken with the Discussion Paper is to elevate the goal of comparability to the level of risk sensitivity and simplicity in the regulatory dialogue. By doing this, the Committee acknowledges that regulation and capital standards are not purely a micro-prudential exercise, a matter to get right on a bank-by-bank basis. Rather, the Committee is positioning its efforts on a macro-prudential level, toward getting things right for all banks and for the financial system as a whole.

On comparability, the Committee acknowledges in Paragraph 31 that "bank equity analysts have frequently remarked on the difficulty of understanding differences in risk-weighted assets across

firms and through time." We share this opinion. Since we know little about the specifics of either the risk models or the portfolios, it is difficult to use risk disclosures to even ascertain which banks took significant risk-reducing steps over a particular period.[1]

The lack of efficacy of risk disclosures is not just a missed opportunity for analysts, however; it is a missed opportunity for supervisors. Risk disclosures that do not inform analysts also do not encourage market discipline: it is possible that investors might reward banks with desirable risk profiles or efficient returns on risk, but only if they understand those risks. Moreover, risk models whose disclosures are scrutinized get challenged, improve and adapt to new conditions; risk models that simply fulfill a compliance demand to produce a risk number will only atrophy.

Working toward comparability, therefore, means working toward meaningful disclosure, which in turn means better models, which in turn means more effective risk sensitivity, another of the three main goals. Of the ideas proposed in Section 5 of the Discussion Paper, *Enhancing disclosure* has the greatest potential to encourage this positive feedback loop.

The Committee makes the useful distinction between comparability across firms and through time. While enhanced individual bank disclosure, as mentioned in Paragraph 50, may address the latter, it will not address the lack of comparability across banks, as long as risk-weighted assets are based on internal models. To achieve comparability across banks, there is a need for a degree of coordination that is not present today.

Coordination does not necessarily imply burdensome regulation, nor the abandonment of internal models. The Committee in fact raises one form of coordination in Paragraph 53: disclosure of model results on a set of standardized hypothetical portfolios. We see great potential in this idea, and have argued in the past that standardized portfolios for risk disclosure could have applications beyond risk-weighted assets.[2] Thus, we could imagine an enhanced disclosure regime wherein each bank discloses their internal model's estimate of risk on the bank's portfolio, as well as the same model's estimate on the set of hypothetical portfolios, or risk benchmarks.

Under this enhanced regime, analysts could compile the results on the risk benchmarks in order to calibrate the banks' assessments of their own portfolios. This would enable analysts to better judge the relative riskiness of bank portfolios as well as the effectiveness of risk-reducing actions or capital allocation decisions. And on a higher level, by transforming risk-weighted assets into a meaningful disclosure mechanism, the notion of risk benchmarks could be a large step toward restoring trust in the internal models regime as a risk sensitive and equitable means for setting capital levels.

Supervisorsstand to benefit from disclosure on risk benchmarks as well. In its study *Analysis of Risk-Weighted Assets for Market* Risk, released in February 2013, the Committee compared the

[1] Finger, C. (2013) Examining 2012 Bank Risk Disclosures: Making a Case for Risk Standards. MSCI Market Insight, July.
[2] Finger, C. (2013) Risk Models for Capital and Margin. MSCI Market Insight, March.

risk estimates of a number of large banks on a set of simple benchmark portfolios. The study was extremely valuable as an indicator of the dispersion in results across banks and of the model design elements that most influenced dispersion. But the study was limited in that it only represented a single point in time, a small number of banks, and a set of portfolios that were not designed to be representative of a large trading operation.[3] By formalizing a reporting process across a greater set of banks on a richer set of portfolios, supervisors would create an invaluable source of data to inform future policy decisions.

Moreover, with the risk benchmarks publically disclosed (as were the portfolios in the February 2013 study), third parties could also contribute to the dialogue by providing results based on standard, publically available model assumptions. And all model results, bank and third party, could be compared to ex-post returns in order to assess accuracy and bias in the forecasts.

While we do not feel that the computation of risk on the benchmark portfolios should represent an undue burden once the portfolios are established, we do recognize that defining a set of portfolios that are both representative and manageable will be difficult. In the interest of comparability, we encourage the Committee to promote the definition of risk benchmarks as a joint regulatory-industry objective.

The enhanced focus on risk disclosure raises issues related to another idea in Section 5, *Reconsidering the linkage between internal and regulatory models*. Of the distinctions between the two types of models, the risk horizon is the most important one. Distinct horizons derive from the distinct aims of the internal and regulatory risk management processes. The regulatory model, used to establish minimum capital levels, must anticipate a long risk horizon, one over which a bank can raise capital or significantly change its risk-taking activities. Internal models, on the other hand, are used to manage risks at a tactical level, and should reflect the shorter horizon over which trading and investment decisions are made.[4]

We do not see risk appetite as a plausible explanation for differences in banks' internal models. Two banks could indeed manage risks over different horizons, and therefore manage based on models with different degrees of responsiveness. But risk appetite should not drive model decisions. A larger risk appetite means a bank is willing to take on more risk, not to measure less of it.

But if we can argue that risk horizons vary across banks and differ between internal and regulatory purposes, what does this mean for the linkage between the two model types? The Committee points out in Paragraph 66 that the "use test" is a means to discourage banks from intentionally underestimating risk for regulatory purposes. The logic is that if a bank uses its internal model for management purposes, it will have an incentive not to underestimate risk. This incentive then balances the natural incentive to keep capital requirements low by not

[3] For further discussion, see the presentation *Analysis of Risk-Weighted Assets for Market Risk:* Complementing the Basel February Study, included as an appendix with this letter.
[4] Finger, C. (2009) VaR is from Mars, Capital is from Venus. RiskMetrics Research Monthly, April.

overestimating risk. Divorcing regulatory models from internal ones would appear to eliminate one side of this balance.

This brings us back to disclosure. We believe that risk disclosure, under the enhanced framework discussed earlier, would provide a similar set of incentives. The discipline of a public risk disclosure framework that has the attention of analysts and investors should more than compensate for a loss of incentives from a weakening of the use test.

In closing, we congratulate the Committee on its enlightening and provocative Discussion Paper, and hope that our comments prove useful in further deliberations. We would be pleased to provide further clarification or commentary should the Committee desire.

Sincerely,

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Market Insight

Examining 2012 Bank Risk Disclosures: Making a Case for Risk Standards

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Abstract:

It has been common practice for over a decade for banks to make public risk disclosures. The detail provided in these disclosures varies across banks, which makes comparison difficult. In this paper, we propose a set of standards in order to analyze these disclosures. In particular, we compare a sample of bank risk disclosures with our set of standards, identifying banks whose risk appears to have moved by enough to suggest a degree of active management.

Why This Matters:

- Bank risk disclosures are difficult to interpret.
- A set of risk standards can help explain changes in disclosed risks.

Introduction

> *"While some banks provide more detailed disclosures than others, in general public disclosures did not provide sufficiently granular information to establish conclusively what is driving the differences."*
>
> Basel Committee on Banking Supervision, February 2013

The quote above was the conclusion of the Basel Committee's recent investigation of bank risk disclosure practices. Far from shocking, and consistent with the experience of bank analysts and stakeholders, the only real surprise was that the Committee did not publish such an opinion sooner.

Banks have made public risk disclosures, using their own models, since bank portfolio risk models were popularized in the second half of the 1990s. Not coincidentally, risk-sensitive capital standards started

about the same time. While the debate on risk-based capital is quite visible, the response of the industry to less than useful disclosure has been mostly one of resignation. Only when there is a large, evident flaw in risk modeling—such as with JP Morgan in 2012—do questions of effective risk disclosure come forward. In the case of JP Morgan, the public attention has been mostly on the governance issues at that institution rather than on the broader question of how to make all risk disclosure more useful.

We wrote earlier this year[1] that to reestablish the trust between consumers and producers of risk information, the industry must produce a set of standard models and portfolios that provide a meaningful basis of comparison for risk disclosure. In this Market Insight, we offer an example of what a set of standards could look like.

We utilize our proposed standards to evaluate disclosed bank risks for 2012. Our focus is to attribute changes in risks: to the market, to active management on the part of the bank, or to a combination of the two. In this paper, we introduce a set of proposed standards, and use these to explain changes in bank risk profiles from 2011 to 2012. While the results are encouraging, the greater message is that more representative sets of positions are needed.

Bank Risk Disclosures

In this study, we analyze risk disclosures from the 2011 and 2012 annual reports of twelve global banks. Though the banks do not typically disclose details of their portfolios, limited information is given as to the model used and, in particular, the length of the historical data period. We therefore divide the banks into three categories based on the time period of data used in their risk models.

Short Term:

- Deutsche Bank (one year Monte Carlo)
- Goldman Sachs (weighted historical)
- ING (one year historical)
- JP Morgan (one year historical)

Medium Term

- Citigroup (max of one year and three year Monte Carlo)
- Credit Suisse (two year weighted)
- Barclays (two year historical)
- RBS (two year historical)

Long Term

- Bank of America (three years historical)
- Morgan Stanley (four years historical)
- UBS (five years historical)

[1] See Finger (2013), Risk Models for Capital and Margin, MSCI Market Insight, March.

All the banks in the sample disclose the average, maximum, and minimum Value-at-Risk (VaR) at either the 95 or 99 percent confidence level, for each calendar year. Some banks show more detail, but this is the common denominator across our sample. In Table 1, we summarize the average and range (maximum - minimum) for 99 percent[2] VaR for 2011 and 2012. The changes in average and range are of December 31, 2012 relative to December 31, 2011 disclosures. The highlights indicate increases in the average or range.

In general, disclosed risk fell from 2011 to 2012, in most cases by 25 percent or more. The one exception to this is JP Morgan, where the well-documented events surrounding the Chief Investment Office accounted for a significant increase.

Recalling the Basel Committee comments referenced earlier, it is desirable to analyze what drove the differences between the 2011 and 2012 disclosed risks. Can an analyst say with confidence that any of the banks took active portfolio management steps to reduce their risk, or was the relative calming in the markets in 2012 the primary driver? To address this question, we propose a number of standards for comparison.

Table 1: Banks 99 percent VaR disclosures 2012, compared with equivalent values in 2011, all in USDm.[3]

Model Type	Bank	2012		2011		Change in	Change in
		Average	Range	Average	Range	Average	Range
Short Term	Deutsche Bank	75.3	48.5	94.7	65.1	-20%	-26%
	Goldman Sachs	121.6	77.8	159.8	123.0	-24%	-37%
	ING	24.2	42.9	35.4	31.7	-32%	35%
	JP Morgan	215.0	227.7	142.8	113.1	50%	101%
Medium Term	Citi	115.0	53.0	153.0	101.0	-25%	-48%
	Credit Suisse	61.0	60.0	105.0	122.0	-42%	-51%
	Barclays	87.4	110.4	131.0	126.4	-33%	-13%
	RBS	158.2	114.6	171.5	197.7	-8%	-42%
Long Term	Bank of America	75.0	86.2	166.8	243.6	-55%	-65%
	Morgan Stanley	103.2	70.7	182.4	120.2	-43%	-41%
	UBS	51.0	230.2	117.4	295.1	-57%	-22%

[2] Where banks disclose 95 percent VaR we have converted this to 99 percent VaR (assuming a normal distribution) for the purposes of comparison.

[3] We convert the VaR disclosures not made in USD using the exchange rate as of December 31, 2012.

Risk Standards

To establish standards for comparing the bank disclosures—risk benchmarks of a sort—we produce risk estimates for three index portfolios:

- Barclays US Investment Grade Index
- iBoxx EUR Corporates Index
- MSCI World Index

For each of these indices, we use four risk models, aimed to resemble the models described by banks in their disclosures:

- *mc97* – Monte Carlo, decay factor 0.97 for volatility/correlation
- *hist1y* – historical simulations, one-year lookback, daily returns
- *hist3y* – historical simulations, three-year lookback, weekly returns, four-day overlap
- *hist5y* – historical simulations, five-year lookback, weekly returns, four-day overlap

The risk estimates for these indices and models for 2011 and 2012 are shown in Table 2, with increases in the average or range highlighted. As with the bank disclosures in Table 1, risk generally decreased for the index portfolios, though there is variation across models.

The greatest reduction in risk are evident with *mc97* (the most reactive model) and *hist3y* (for which the highly volatile data from early 2009 falls out of the model window). Risks under the *hist1y* model increase slightly for two of the three portfolios. Under the most stable model, *hist5y*, risks show little change. This is not surprising, since the data from the most volatile period (late 2008) is included for this model in both 2011 and 2012.

Table 2: The 99 percent VaR for fixed portfolios, comparing 2012 and 2011.

Model Type	Bank	2012		2011		Change in	Change in
		Average	Range	Average	Range	Average	Range
mc97	iBoxx EUR Corporates	40.5	42.9	46.2	50.8	-12%	-16%
	MSCI World	210.0	196.3	267.4	311.1	-21%	-37%
	Barclays US Inv Grade	54.0	33.8	77.4	61.3	-30%	-45%
hist1y	iBoxx EUR Corporates	59.0	31.4	50.3	35.3	17%	-11%
	MSCI World	360.9	242.7	332.3	225.7	9%	8%
	Barclays US Inv Grade	82.6	35.5	90.0	15.1	-8%	136%
hist3y	iBoxx EUR Corporates	55.0	21.8	62.5	31.2	-12%	-30%
	MSCI World	325.4	69.1	495.4	198.1	-34%	-65%
	Barclays US Inv Grade	70.9	25.2	90.4	8.3	-22%	205%
hist5y	iBoxx EUR Corporates	70.9	27.7	69.4	43.8	2%	-37%
	MSCI World	430.8	21.4	441.2	24.0	-2%	-11%
	Barclays US Inv Grade	90.9	12.2	85.4	18.9	6%	-35%

Comparison of Risk Standards and Bank Disclosures

In the previous sections, we presented regulatory disclosures and our risk standards for comparison. Overall, 2012 was a year of reduced risk in the markets relative to 2011, and this is reflected in both the bank disclosures and the standards.

For Goldman Sachs, Deutsche Bank and the majority of the banks in our sample that use medium-term models, changes in disclosed risk were in line with our risk standards. Our standards are of fixed portfolios and fixed models, and so this finding suggests that the main driver of the change in risk for these banks was due to the relative calming in the markets.

There were a few exceptions, however. In particular for ING, whose VaR model uses one year of historical data, the average risk decreased significantly more than for any of the indices under the *hist1y* model. In addition, though Barclays's average risk decreased in line with the fixed portfolios, the reduction in the range of risk was much smaller. Other than suggesting that these banks perhaps had more active management of their risk, the other possibility is that the standards used for these banks are perhaps not entirely representative of the banks' actual portfolios.

The greatest difference between the index portfolio results and the bank disclosures appeared for the banks with longer-term models. Using the five-year historical model, the average risks for the index portfolios were almost unchanged, and the ranges increased by 10-35 percent. All three of these banks reported average VaR declines well beyond any of the index results, with the average decreasing by over 40 percent. Additionally, the ranges for these banks decreased by more than our proposed risk standards.

The change in the range of VaR for UBS seems curious, as it did not fall by as much as the ranges for the other banks using long-term models. In fact, the range for 2012 was driven by a single day, related to the Facebook IPO. Had this outlier not existed, UBS would have shown a similar reduction in range to the other banks (and dissimilar to the risk standards). We were able to identify the cause of this range as, unlike some banks, UBS provided a time series history in its disclosures. Indeed, this additional information provided by UBS was referenced in "best practices" by the Financial Stability Board.[4]

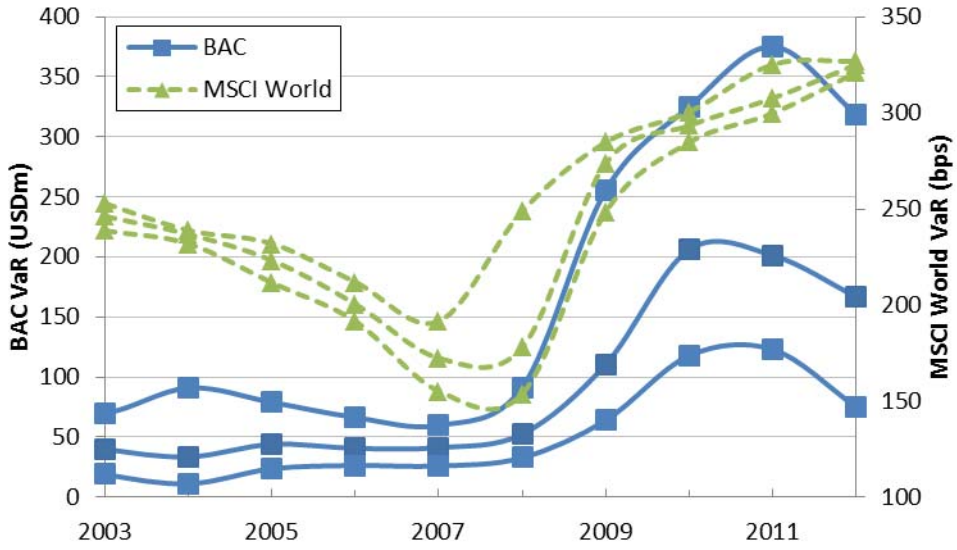
Morgan Stanley changed their VaR model in 2012 to one described in their annual report as a form of "volatility scaling." One might have, therefore, expected that the huge reduction in risk could be due to this model change. Morgan Stanley did provide risk disclosures for 2011 and 2012 using both their old (long-term) and new (shorter-term) models. These disclosures show that most of the drop in risk from 2011 to 2012 was due to the old model. A slight further reduction in risk occured due to the new model, but the majority of the change resulted from the model with a long lookback horizon. This is contrary to the results for our fixed portfolios, where little reduction in risk occurred for the portfolios using the longer lookback. This is another case where a risk standard based on a more representative portfolio would provide more clarity.

[4] See *Enhancing the Risk Disclosures of Banks*, Report of the Enhanced Disclosure Task Force, October 2012.

Risk Disclosures Across Time

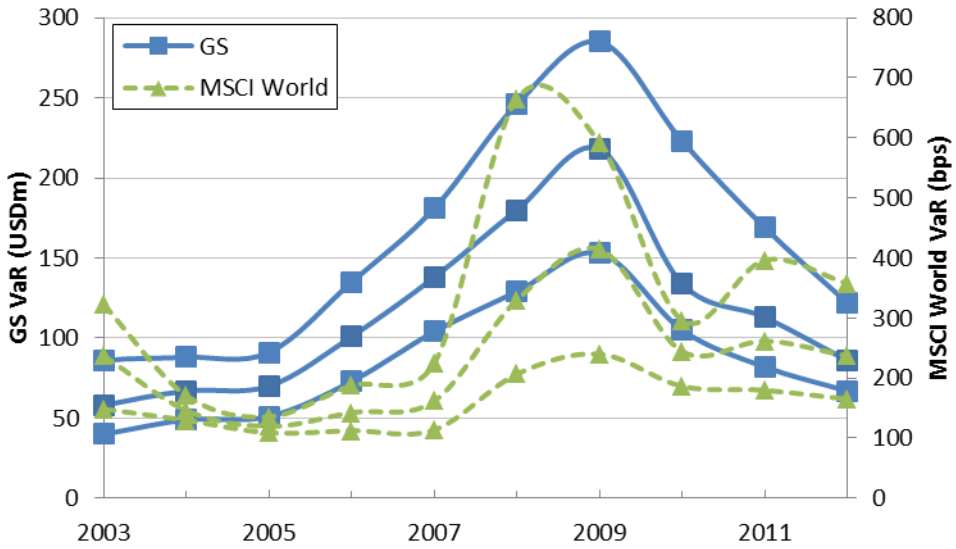
The first part of this paper compared bank risk disclosures with our standards for the period 2011 and 2012. We consider how risk disclosures have changed over time for two of the banks in our sample: Goldman Sachs and Bank of America. In Figure 1, we present the 99 percent VaR for Bank of America (BAC) and compare this to the 99 percent VaR for MSCI World (calculated using the five-year historical model).

Figure 1: Maximum, average and minimum 99 percent VaR for Bank of America (BAC) and MSCI World. BAC disclosures since 2003 and MSCI World VaR calculated using hist5y model.



The disclosed risk for Bank of America from 2003 to 2008 was very stable. The risk for the fixed portfolio on the other hand gradually decreased up to 2007. This suggests that for Bank of America to maintain stable risk, they actively managed their risk, either taking on larger positions or shifting into riskier positions. In the period of the Global Financial Crisis and beyond, the risk of the fixed portfolio soared and though the disclosed risk for Bank of America did increase, the magnitude was not as great, again hinting that they took active measures in this case to reduce risk. The risk of the fixed portfolio kept increasing into 2012, whereas Bank of America disclosed decreasing risk from a peak in 2010.

Figure 2: Maximum, average and minimum 99 percent VaR for Goldman Sachs (GS) and MSCI World. GS disclosures since 2003 and MSCI World VaR calculated using mc97 model.



In Figure 2, we present the risk disclosures of Goldman Sachs, alongside 99 percent VaR for MSCI World (calculated in this case using the mc97 model). Interestingly, though the disclosed risks behaved similarly to the index, the increase in risk for Goldman Sachs occurred before the risk increase for the fixed portfolio. Similarly, in the period after the crisis, the disclosed risk of Goldman Sachs declined more slowly than the risk of the fixed portfolio, possibly indicating the bank was taking advantage of opportunities as the market recovered.

Conclusion

Bank risk disclosures, while a common practice for more than a decade, have not been as useful to investors and analysts as they could be. We demonstrate that a set of risk standards (representative risk models applied to representative fixed portfolios) can shed light on some of the questions left unanswered by existing disclosures. In particular, we highlight banks whose disclosures, viewed alongside the risk standards, indicate a degree of active management and not simply a passive change in risk based on the market. Our analysis is limited, however, by the lack of truly representative portfolios for bank trading businesses. Risk standards based on sets of positions that more closely characterize banks' positions would be an important step forward.

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[1] *As of September 30, 2012, as published by eVestment, Lipper and Bloomberg on January 31, 2013*

Apr 2013

Market Insight

Risk Models for Capital and Margin – The Need for Public Standards

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March 2013

Abstract:

Recent regulatory publications display a need for risk sensitivity for both capital and margin requirements. Risk sensitivity calls for risk models, but the successful application of these for regulatory purposes has been a challenge for the industry. We suggest the adoption of a common framework of risk standards as a mechanism to help ensure the success of risk sensitive regulatory standards.

Why This Matters:

- Recent regulations for both capital and margin requirements point to risk models.
- Recent studies demonstrate great variability in proprietary risk model results.
- The industry is in need of a standard mechanism for comparison across risk models.

Regulatory Publications Spark a Debate

The controversy surrounding the use of risk models was stoked again recently with the publication of the Basel Committee's study of internal capital models,[1] which revealed large disparities in risk assessments on a standard set of trading portfolios. Though the Committee soberly recommends improving public disclosure of risk models for capital, their study raises doubts on the long-term dependence on risk models for capital.

In a related development, the Committee, together with the International Organization of Securities Commissions, just released its "near-final proposal" on margin requirements for non-centrally-cleared derivatives.[2] The proposal confirms a place for risk models in the risk-mitigation process for essentially all derivatives trades.

Regarding risk models then, the industry is at a crossroads, committing to greater reliance on models while revealing model shortcomings. It would be a step backward to abandon the notion of risk sensitivity for margin and capital, and yet the Basel Committee study undermines the trust that regulators and the public might have in the ability of models to adequately reflect risks. To regain this trust, we recommend that the industry collectively establish common framework of transparent risk standards.

Risk Model Standards for Capital

Capital is an obvious place to start. The original Capital Accord of 1988 (referred to now as Basel 1) was motivated by the single global principle of the level playing field. But the result of this level playing field was that capital standards came down to a simple ratio, with little distinction by risk. The clear regulatory arbitrage was to simply take more risk, leading the Basel Committee to adopt a second global principle, risk sensitivity, for the Market Risk Amendment of 1996.

To achieve risk-sensitive capital standards, global regulators authorized banks to use internal risk models, subject to some modeling standards, a model approval process, and ongoing model validation. And along with the use of internal models for capital came the practice of risk disclosure, where banks would communicate its risk according to the same internal models as part of their quarterly or annual public filings.

From a disclosure perspective, the trouble with internal models is that they are internal. With very little disclosure of actual modeling practices, risk disclosures at best seem to permit analysts to assess whether a bank's risk taking has increased or decreased between filings. But it is not clear whether an increase in risk is active (meaning the bank has shifted positions) or passive (meaning the markets in which the bank operates have heated up). Comparisons across banks are close to impossible.

While risk disclosures appear to have fallen short in informing shareholders or analysts, they seem to have given rise to insinuations that some banks, or even some jurisdictions, are lighter on the same risks than others. Strict model validation standards should have assured a common global standard of model prudence, but (as the Basel study points out in another policy recommendation), these have not been sufficient. The effort to apply the second global principle would seem to have undermined the first.

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[1] Basel Committee on Banking Supervision, *Regulatory Consistency Assessment Programme (RCAP) – Analysis of Risk-weighted Assets for Market Risk*, January 2013.

[2] Basel Committee on Banking Supervision and International Organization of Securities Commissions, *Second Consultative Document on Margin Requirements for Non-centrally Cleared Derivatives*, February 2013.

The principles of a level playing field and risk sensitivity are not incompatible, however, and the Committee's recent study points to a solution. As a condition of model approval, in addition to the processes that exist today, we suggest that regulators require banks to disclose their model's assessment of risks on a set of standardized, representative portfolios. These risk standards could help establish the Basel Committee's desired "variation benchmark"—the acceptable degree of variability due to differing modeling assumptions and appetites for risk. At the same time, systematic biases would be revealed, or suspicions of them refuted.

Margin—the New Role for Models

Whereas capital has been regulated internationally for decades, strict reform of how derivatives trade is largely a reaction to the financial crisis of 2008. The most visible piece of reform is the mandate for central clearing of the most standard derivatives. Under central clearing, a derivative that previously would have been a contract between two participants now becomes two offsetting contracts, each between one of the participants and a central counterparty (CCP). The participants no longer have direct credit exposure to each other, but only to the presumably well-capitalized CCP. As long as the CCP is safe, the default of a single derivatives participant cannot pose a threat to the remainder of the system.

Recent reforms are not limited to centrally cleared derivatives, however. Regulators internationally are working to establish principles and requirements for those derivatives that do not fall under the central clearing mandate. The regulatory principles are intended to ensure that the same barricades to systemic risk that central clearing affords are available for non-cleared derivatives as well.

The first barricade is variation margin, a mechanism by which counterparties in a derivative contract post margin to each other on a regular basis according to changes in the valuation of the derivative. Daily posting of variation margin is standard in centrally cleared derivatives, and its requirement for non-cleared derivatives is largely uncontroversial.

The second barricade, initial margin (or independent amount), is intended to protect the surviving counterparty (the CCP in a cleared derivative) from the undesired market exposure on a derivative that results from a counterparty default. Whereas variation margin covers market moves as they are realized, initial margin covers the potential losses incurred from the time of the last variation margin exchange to the time at which the contract is closed out, or replaced. The critical distinction between the two types of margin is between covering realized versus potential losses, and leads to the need for risk models. Initial margin is a standard requirement for cleared derivatives, and the recent "near-final proposal" is that initial margin be required, subject to some minimum threshold on most non-cleared contracts.

To calculate initial margin, derivative participants must consider the market volatility of the contract, its liquidity, how long it will take to close or replace the contract, and how the contract relates to others with which it might be eligible for netting. As with capital, it is clear that an effective initial margin mechanism must be risk sensitive: different contracts will have different potential losses, and the initial margin charged should reflect this.

Finally, where derivatives exposure falls under the minimum threshold, the counterparties bear each other's credit risk, and should reflect this in both the capital they hold against the risk and the pricing they demand for committing this capital. As with initial margin, the capital and pricing should reflect potential exposure that market fluctuations could produce. Risk sensitivity again is a requirement.

And risk sensitivity demands models. But the necessity of models for margin leads to many of the same issues as with models for capital. How can the industry ensure that the models are sound, and that the playing field is level?

One cause for optimism is that, unlike for capital, there is an incentive here for the industry to self-regulate. With capital, a bank has only the incentive to keep its capital levels low, and is never directly exposed to other institution's own capital models. There is no business incentive for a bank to complain that its capital requirements are too low, and thus regulation of the models falls squarely on the regulator.

With margin as well, there is an incentive for a bank to keep its requirements low, to reduce the liquidity need for trading derivatives. But at the same time, if a bank's counterparty demands margin that is insufficient to cover risks, or fails to adequately capitalize for un-margined exposure, and does this systematically, then the counterparty poses a risk to the system. It is in all participants' interests that other derivatives participants charge adequate margin. This is more than wishful thinking, as exemplified by the recent episode where a number of clearing members demanded that a CCP strengthen its risk-based margin standards. It is easy to imagine a comparable case where a group of banks raises questions about the margin model of a competitor, not simply as a sour grapes reaction to losing business, but out of a genuine concern for their own bottom line.

A Future for Risk Models

Finally, in the space of non-cleared derivatives, the potential for every participant to propose, Babel-like, its own initial margin model raises concerns about dispute resolution and fairness. The negotiation of a bilateral derivative contract should include a stipulation for whose risk model determines margin. If the choice is that each party demand margin according to their own model, how can the parties agree that the two models assess risk to the same standard? And if the choice is to have only one party's model drive margin, then how can the other party (who may in fact not even possess a model) get comfortable with the model's independence, let alone quality?

There are three issues, then, with risk models as applied to margin: validation that models produce prudent standards, reconciliation of distinct models in the same transaction, and confirmation of the independence of a single party's proprietary model. For all three, as with capital, risk standards must be part of the solution. For more straightforward transaction types, there may be some evolution to independent standard models for the actual margin calculations, if only to make negotiations and operations simpler. But the power of risk standards extends further. An independent, industry-accepted framework would provide a baseline with which market participants of all levels of sophistication could evaluate counterparty models, and from which parties in a bilateral agreement could define tolerances for their own model results.

The need for risk sensitivity for both capital and margin is indisputable. But risk models for capital have had an uneven history, and models for margin are only now becoming mainstream. A common framework of risk standards is the industry's best hope to salvage risk models for capital, and to ensure their success for margin in the transformed market for derivatives.

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[1]As of March 31, 2012, as published by eVestment, Lipper and Bloomberg in September 2012.

Jan 2013

MSCI

A Clear View of Risk and Return

Analysis of Risk-Weighted Assets for Market Risk Complementing the Basel February 2013 Study

Christopher Finger

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Risk Models and Capital Requirements

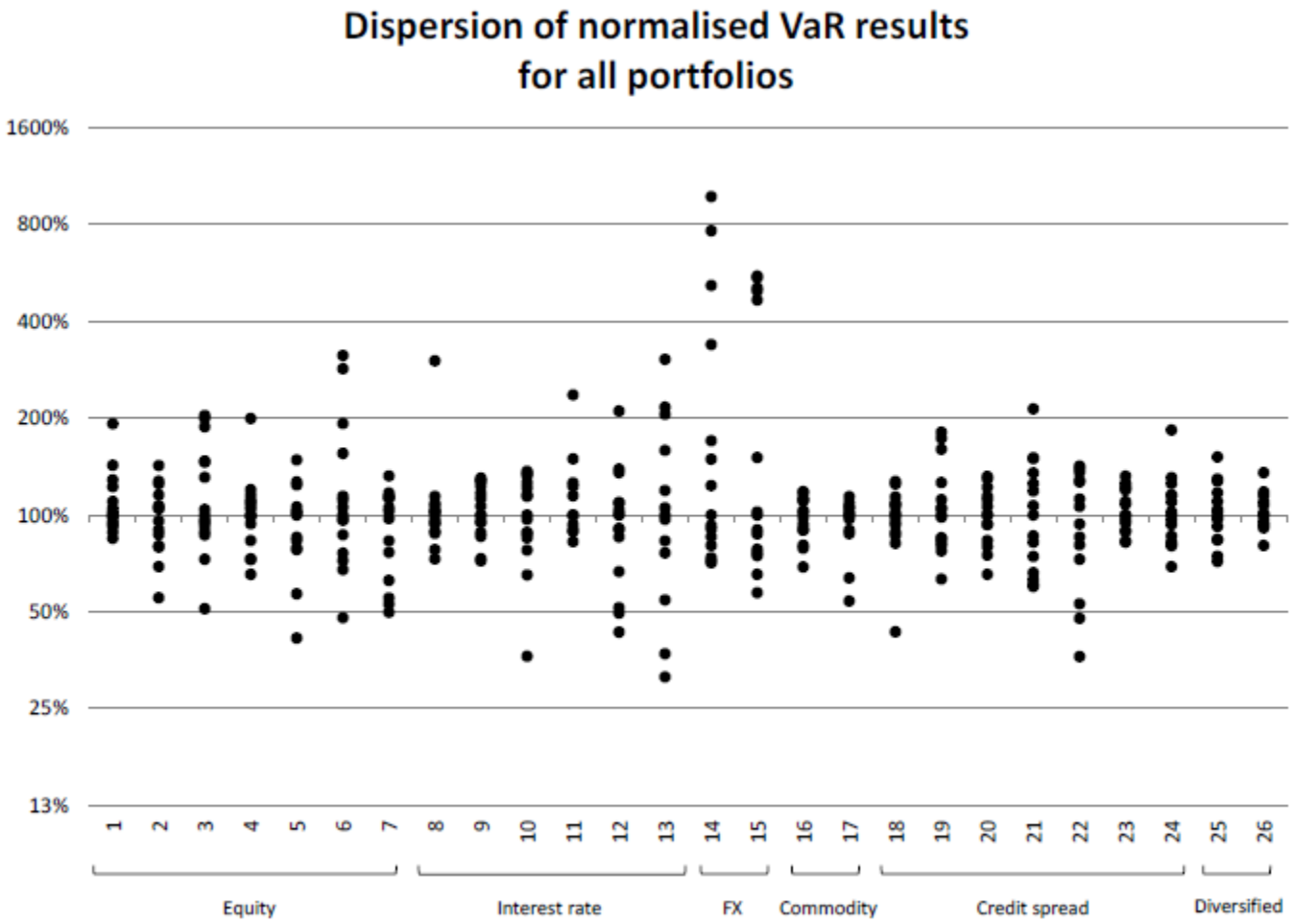
- Since the adoption of the Market Risk Amendment in 1996, banks have had the option to set minimum capital levels for their trading books based on internal risk models
- But questions have persisted:
  - Are the resulting capital requirements truly risk sensitive?
  - Are there systematic biases in model standards?
  - Do banks manage models to manage capital?
  - What degree of variation can be expected from plausible modeling differences?
  - Which model design elements have the greatest impact on results?
  - How should these issues impact capital policy?

Analysis of Risk-weighted Assets for Market Risk

- Study published as part of the Basel Committee's Regulatory Consistency Assessment Program, February 2013
- Regulators asked 16 global banks to submit internal risk assessments for 26 simple, standardized trading portfolios, as of June 2012
- Portfolios are grouped by asset class:
  - Equity (7) – long index future, volatility smile trade, exotic option, etc.
  - Interest rate (6) – IR swap, swaption, basis trade, etc.
  - Foreign exchange (2) – covered call, currency swap
  - Commodities (2) – curve trade, long only
  - Credit spread (7) – bond basket, CDS basket, name concentration, etc.
  - Diversified (2) – combinations of other portfolios
- Study includes, where applicable, three elements of market risk capital: VaR, Stress VaR, Incremental Risk Charge
- This presentation will focus on the VaR results

For VaR, Range is Factor of 2 for Diversified Portfolios, At Least Factor of 4 for Most Others

Figure 9: Scatter plots for all portfolios[33] (NB: for portfolios 25 and 26 the diversification benefit is plotted rather than individual model results)



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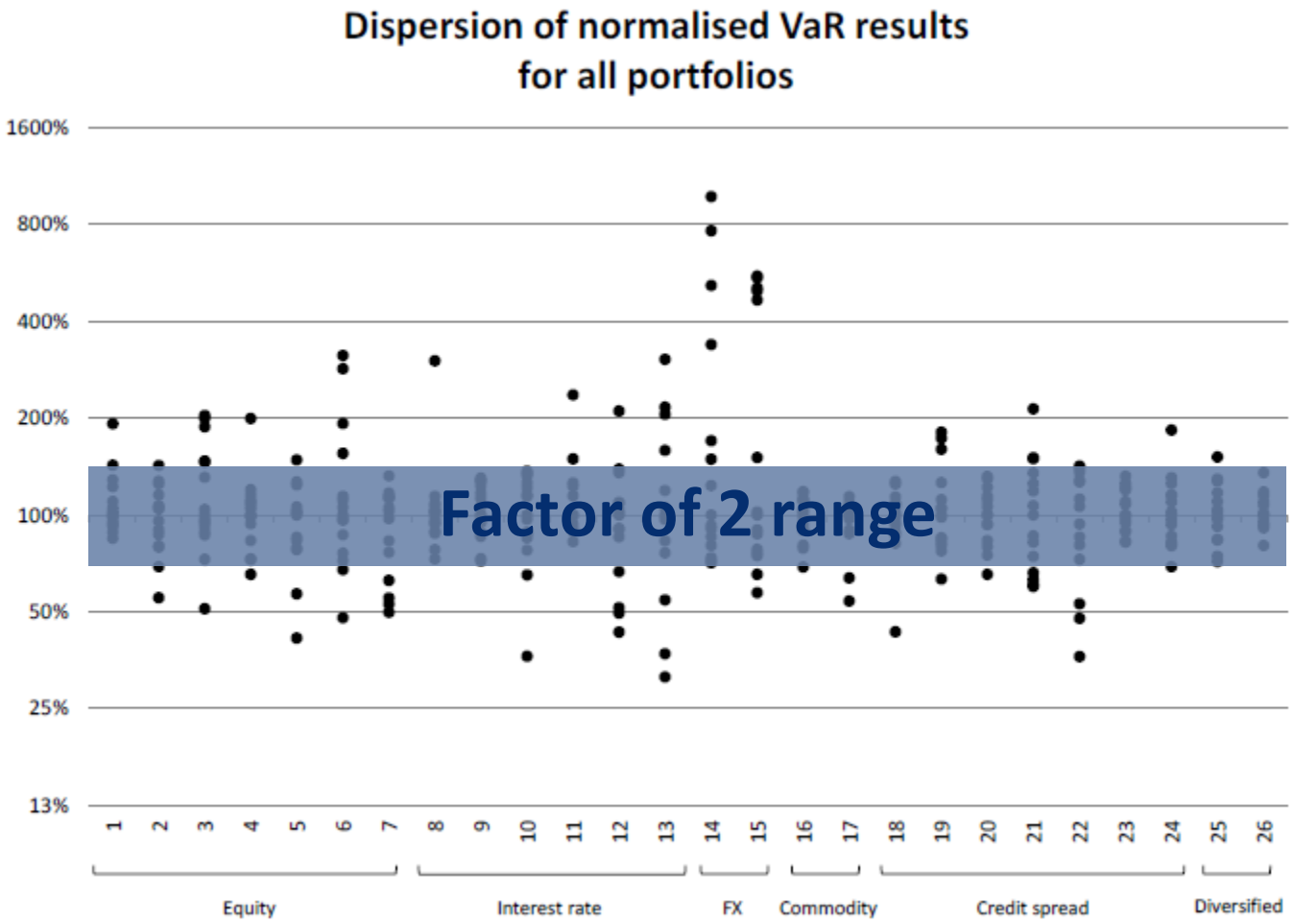

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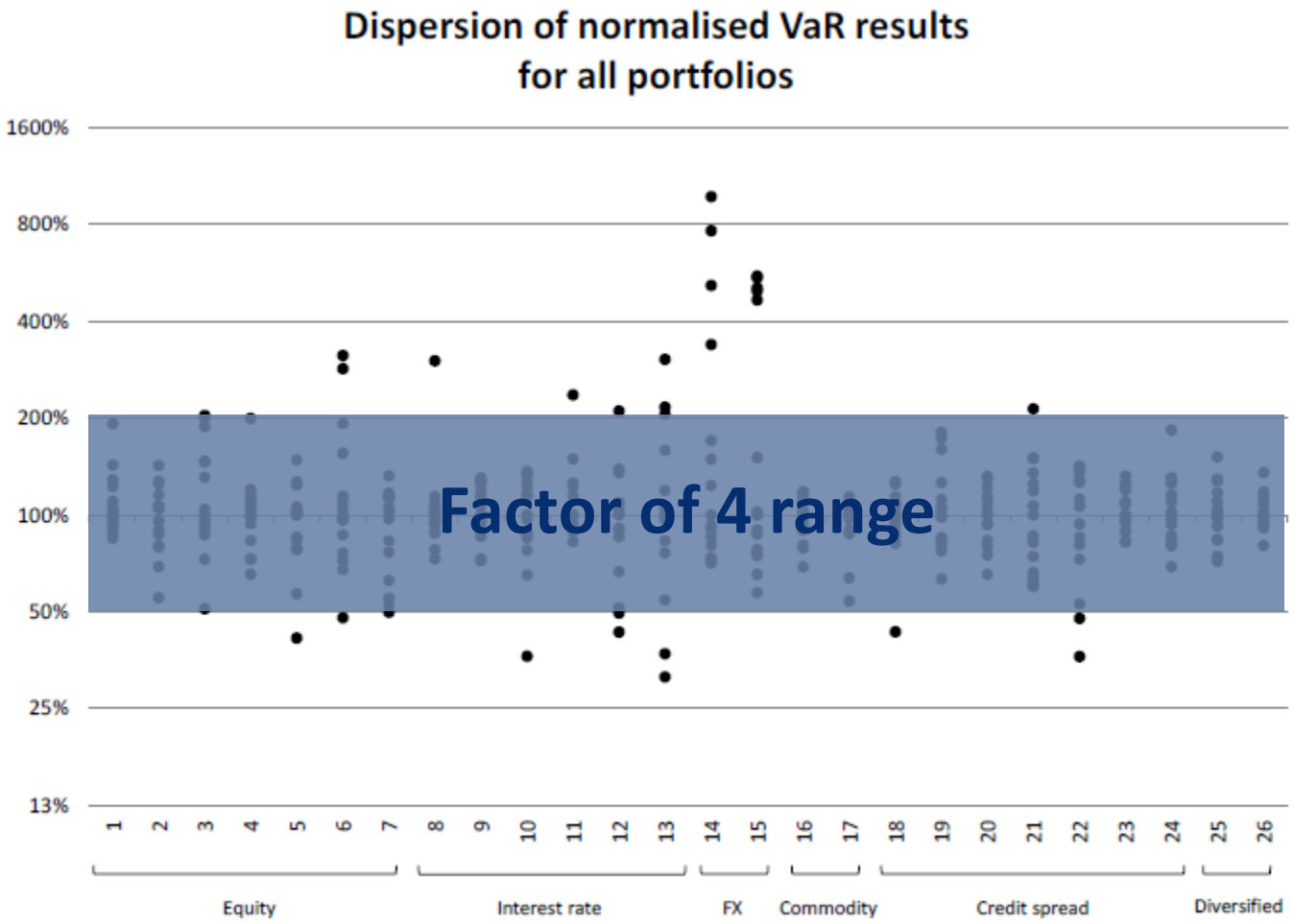

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Sensitivity to Model Assumptions Were Assessed By A "Field Test", Observing Variations Across Banks

Figure 7: Key model choice variability drivers, and their relative impact, for VaR and sVaR

The impact of modelling choices on variability of the VaR model result

Low impact	Moderate impact	Strong impact
Modelling approach (historical simulation versus Monte Carlo)	**Valuation approach (full revaluation or use of approximations)**	**Length of data period for calibration and the weighting scheme applied**
Calibration methodology (use of absolute versus relative returns)	**Risk factor granularity**	**Scaling approach to calculate 10-day measure / use of overlapping periods**
Data updating frequency		**Aggregation approach (aggregation across positions and aggregation of specific and general risk)**
Calculation of VaR percentile		

www.bis.org/publ/bcbs240.htm

But Other Questions Remain

- "Connect the dots." Do the same banks/models produce high/low capital across all portfolios?
- How robust are the model design conclusions?
- How much of the dispersion comes from risk model parameterization, versus pricing model or security description differences?
- Would similar dispersion exist under a different risk metric?

- Address these questions by working with a controlled set of standard model settings

The Complementary Analysis

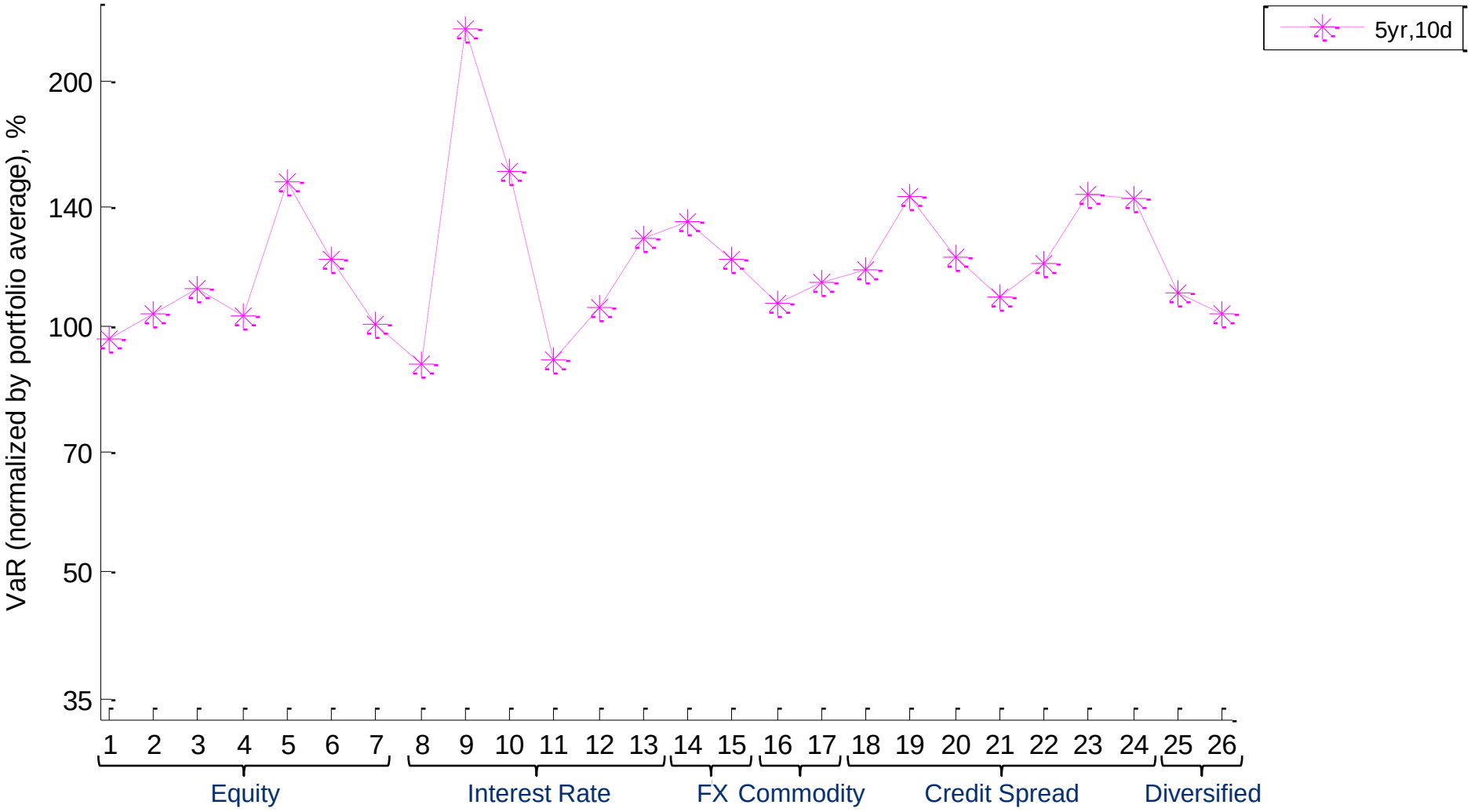
Constant Across Portfolios

- All portfolios modeled in RiskManager
- Specific curves for bonds, CDS
- Standard choice of risk factors
- Standard model assumptions
  - Lognormal price factors
  - Normal interest rates

Varied Across Portfolios

- Range of lookback periods
  - 5 years, equally weighted
  - 3 years, equally weighted
  - 1 year, equally weighted
  - Exponential weighting (0.97)
- Risk methodology
  - Monte Carlo
  - Historical Simulations
- Sampling
  - One-day with scaling
  - Ten-day with overlap

Value at Risk Across All Portfolios



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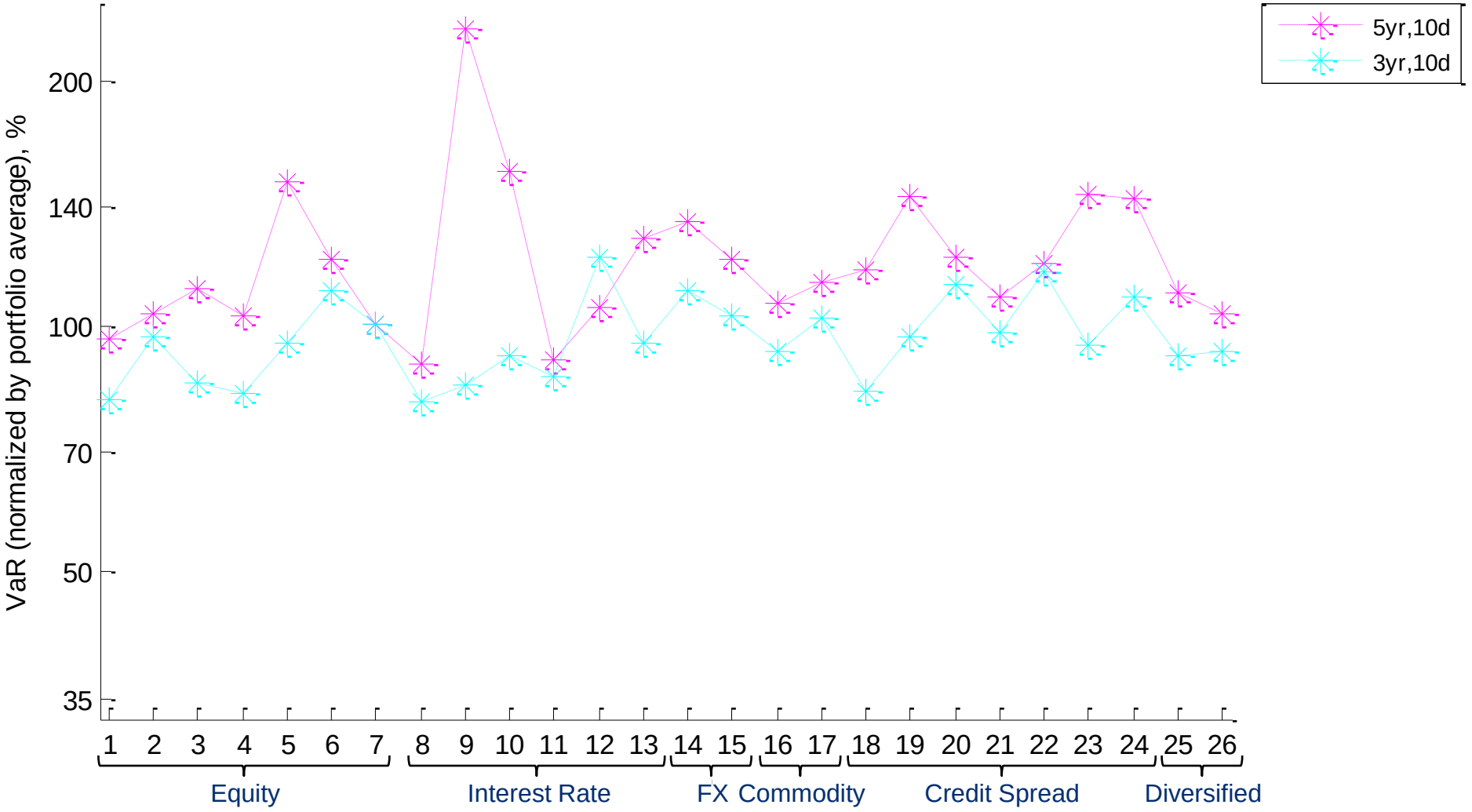

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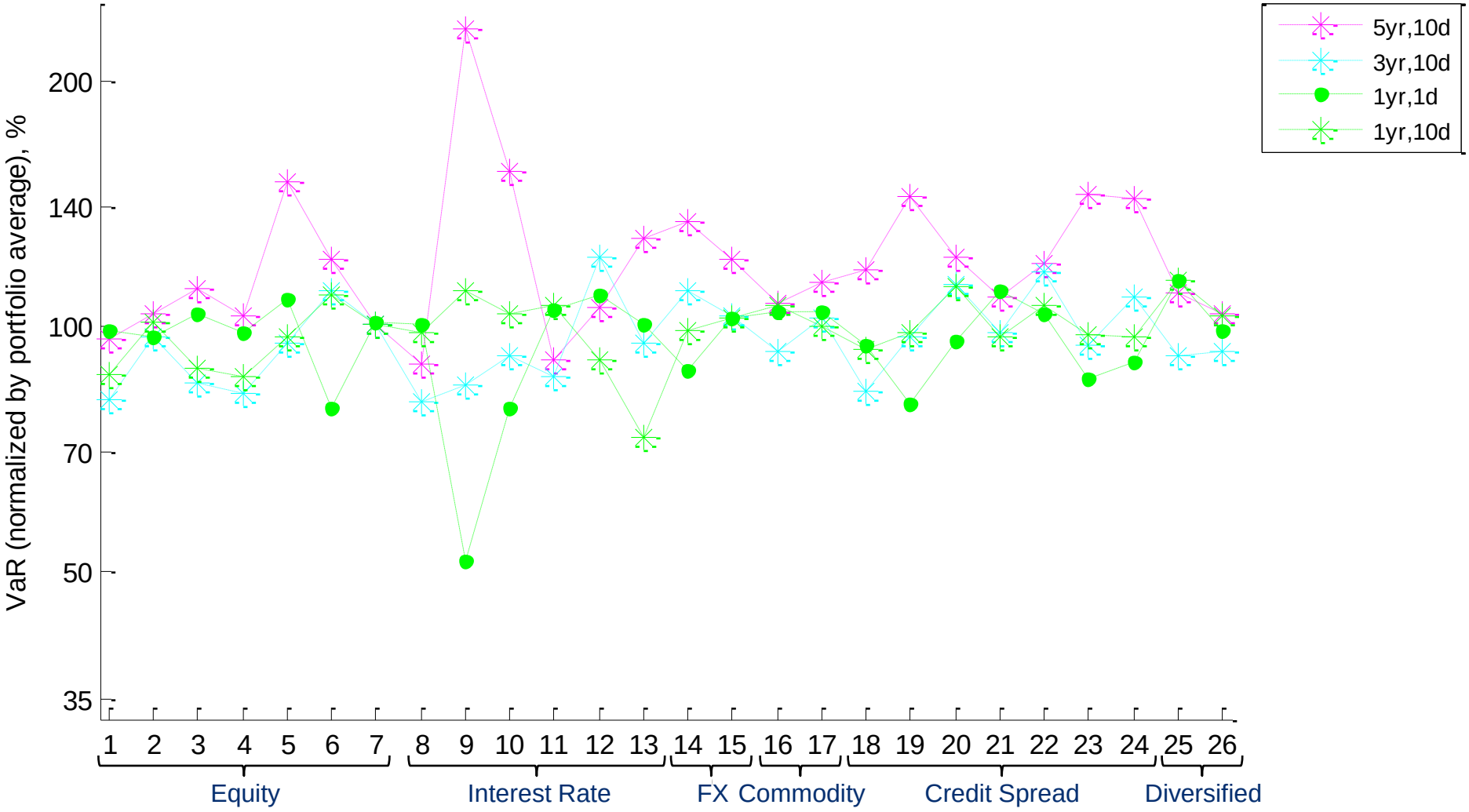

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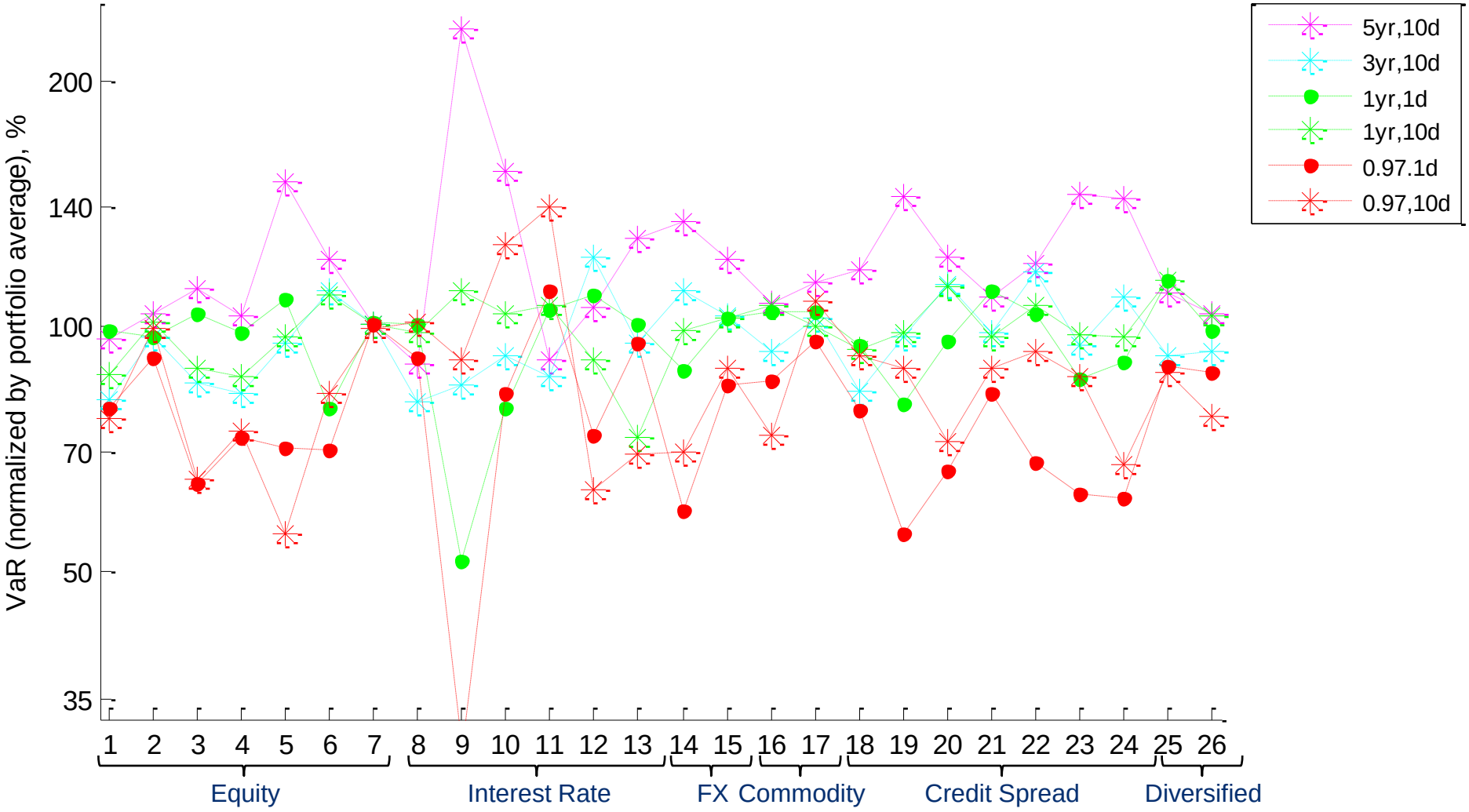

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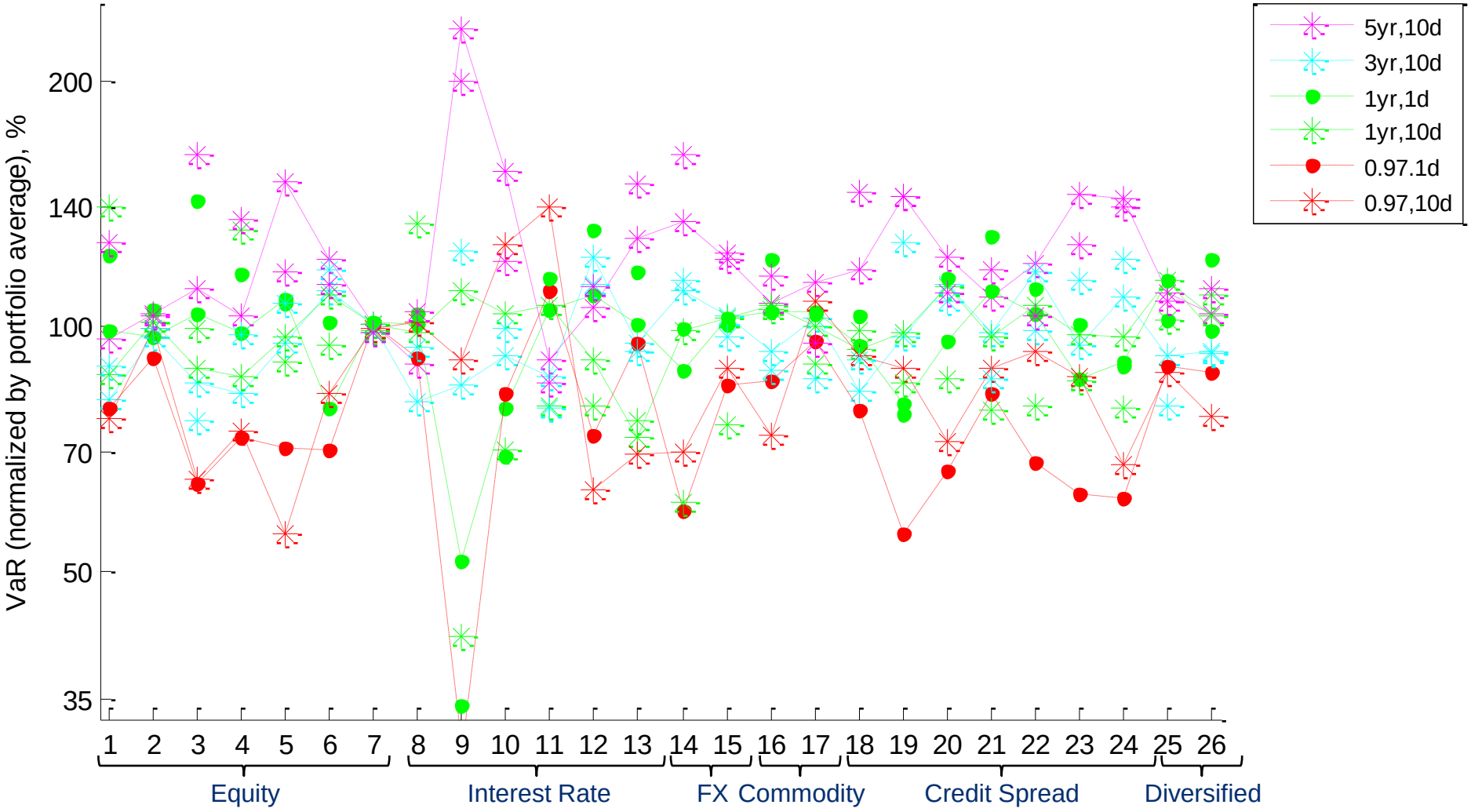
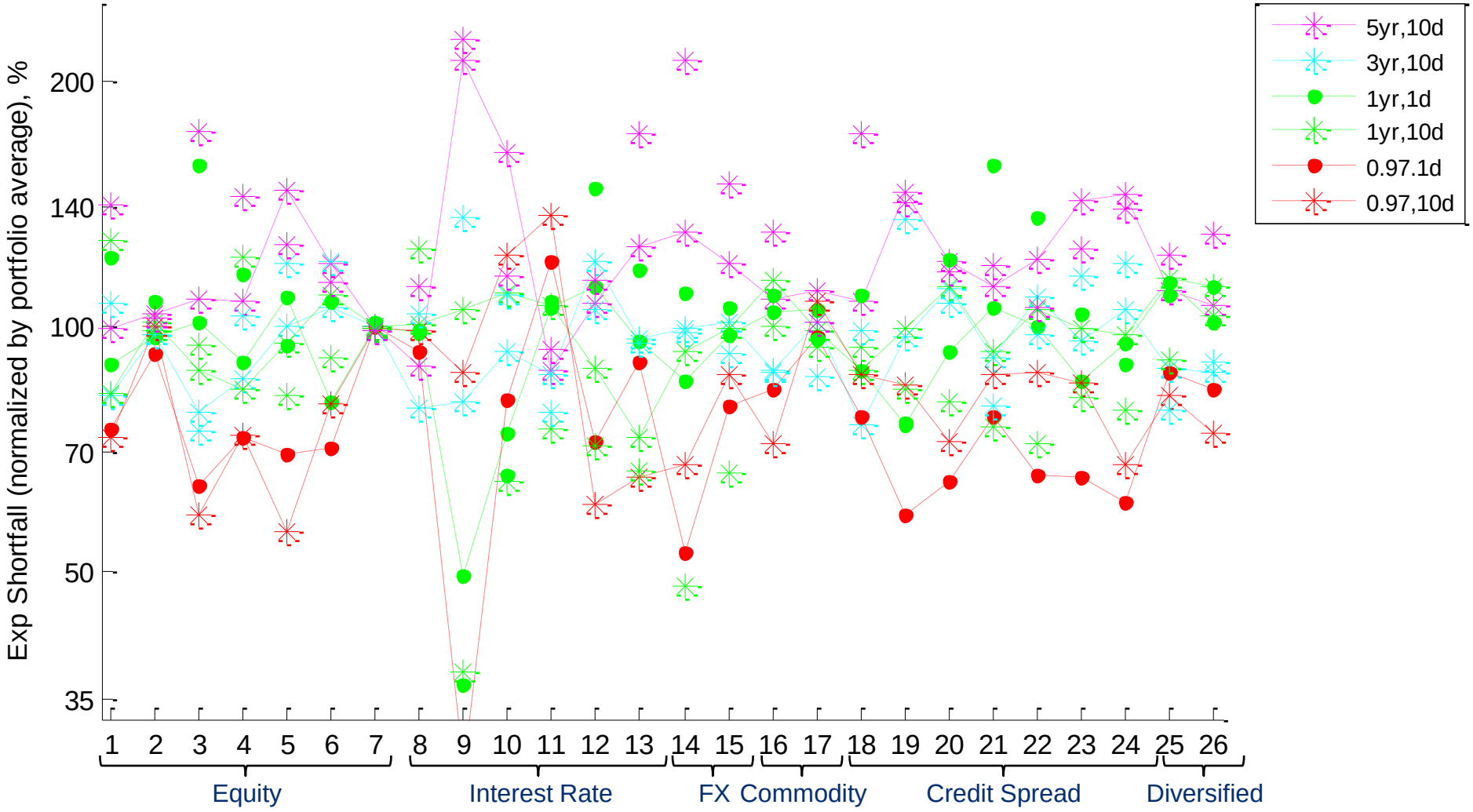
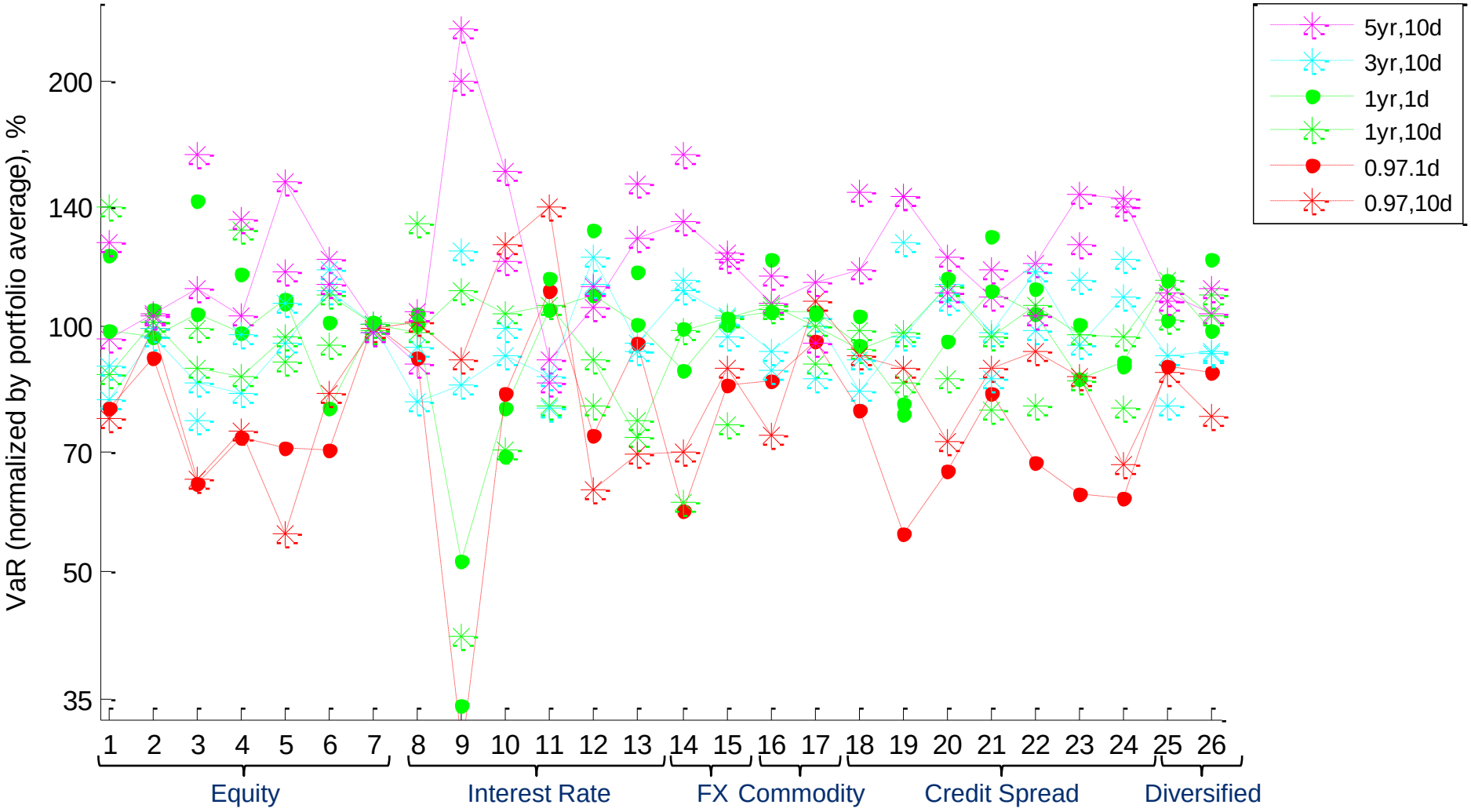


With Expected Shortfall, Very Little Difference In Dispersion



Value at Risk Across All Portfolios



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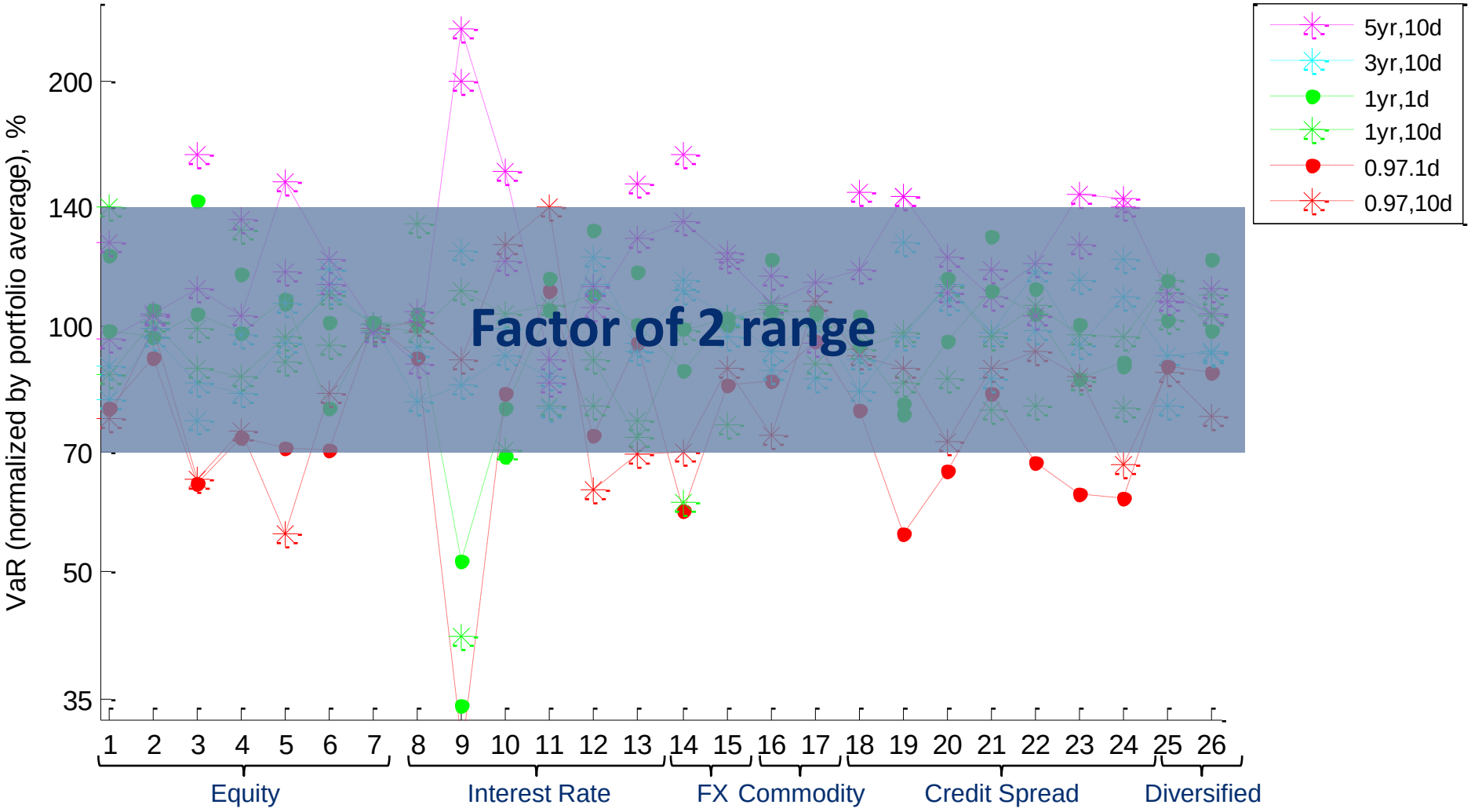
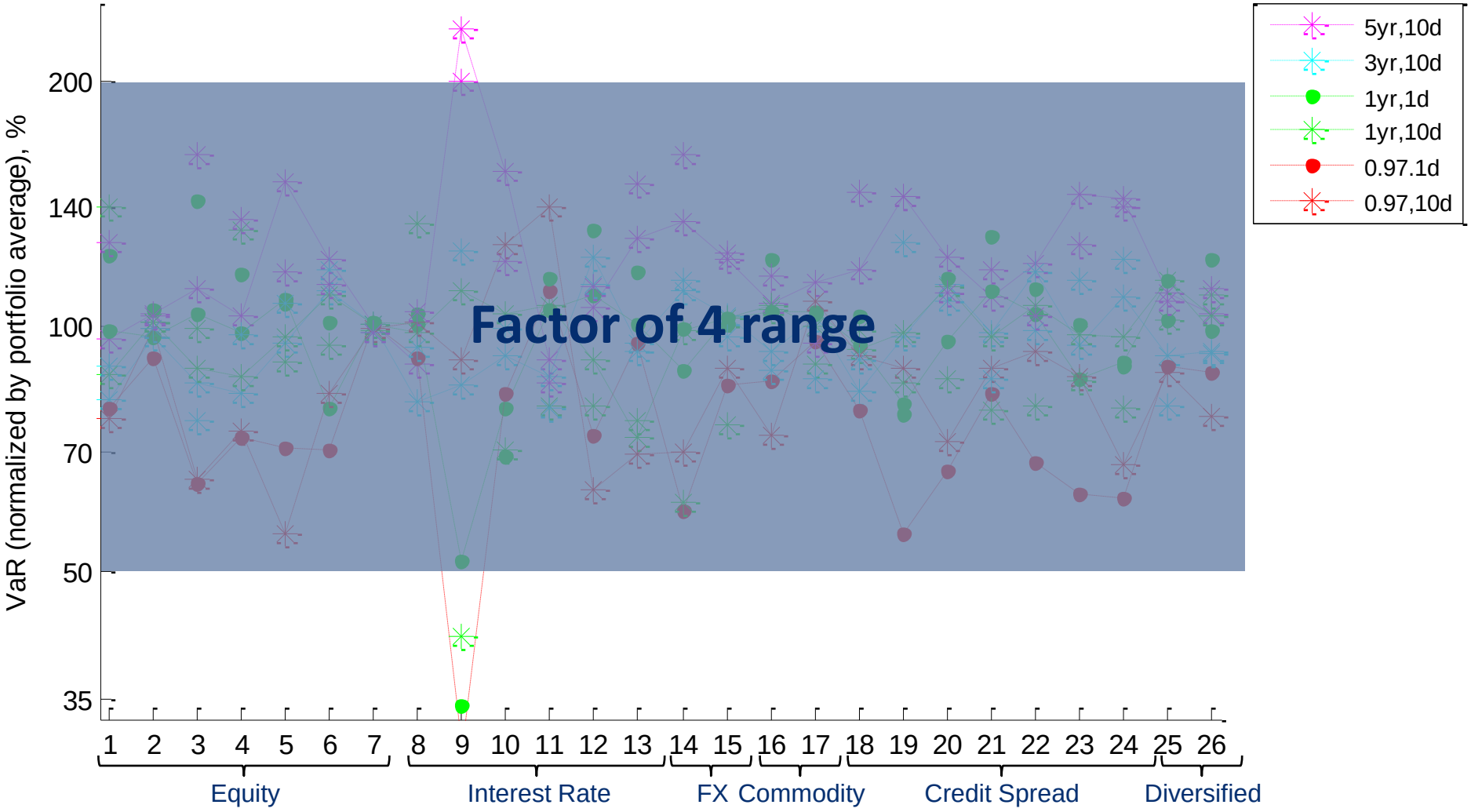
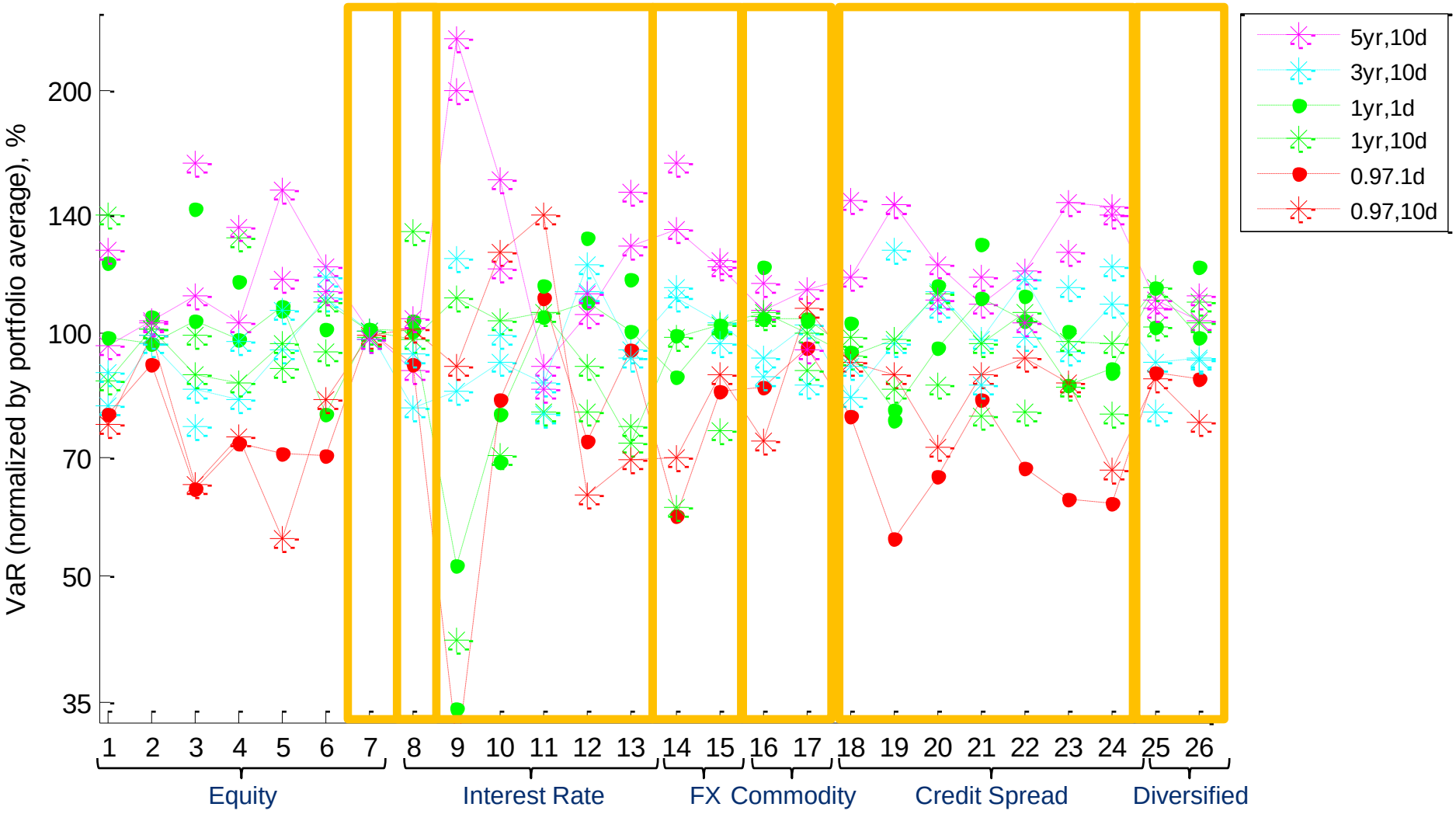


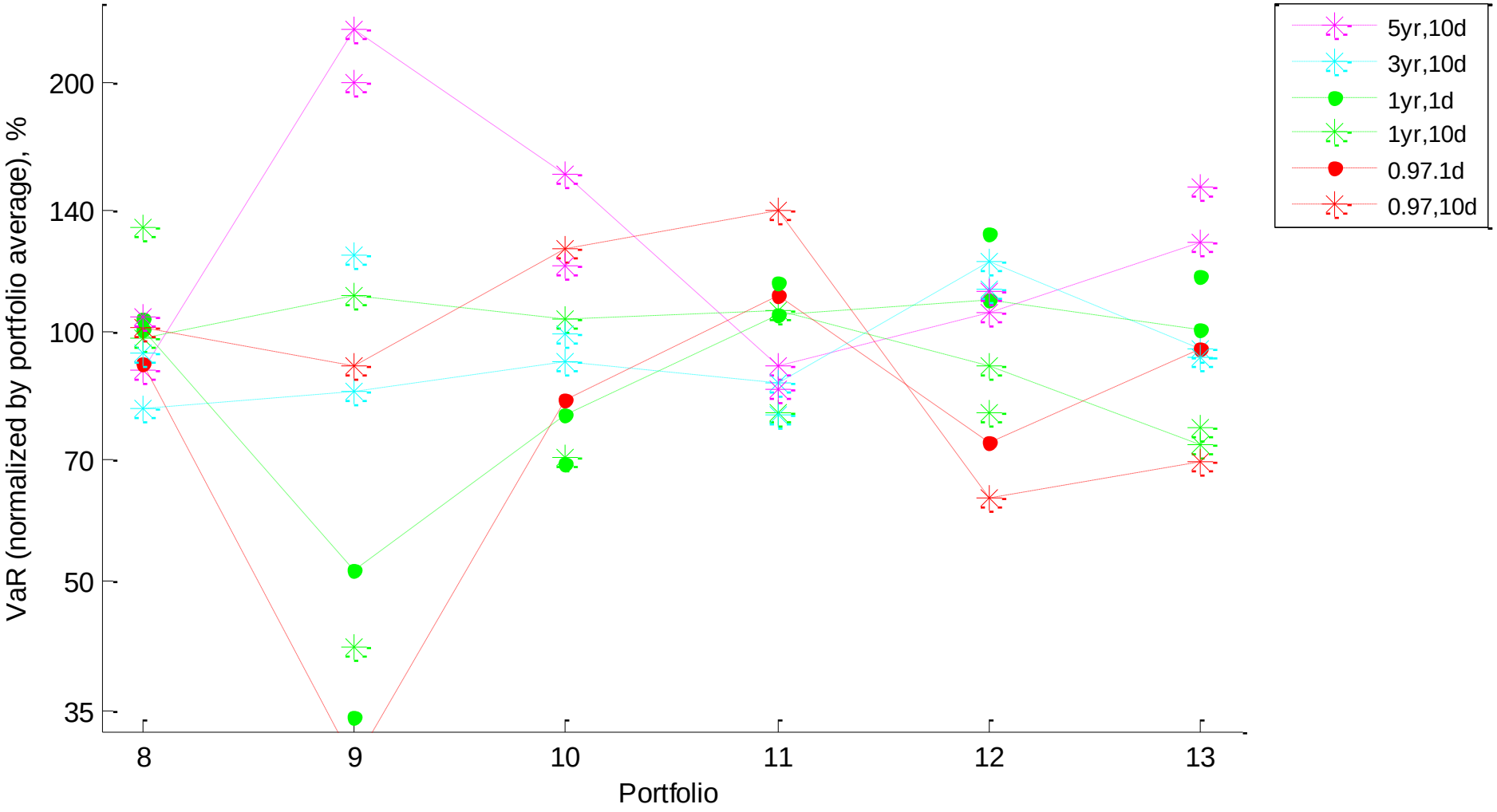
Value at Risk Across All Portfolios



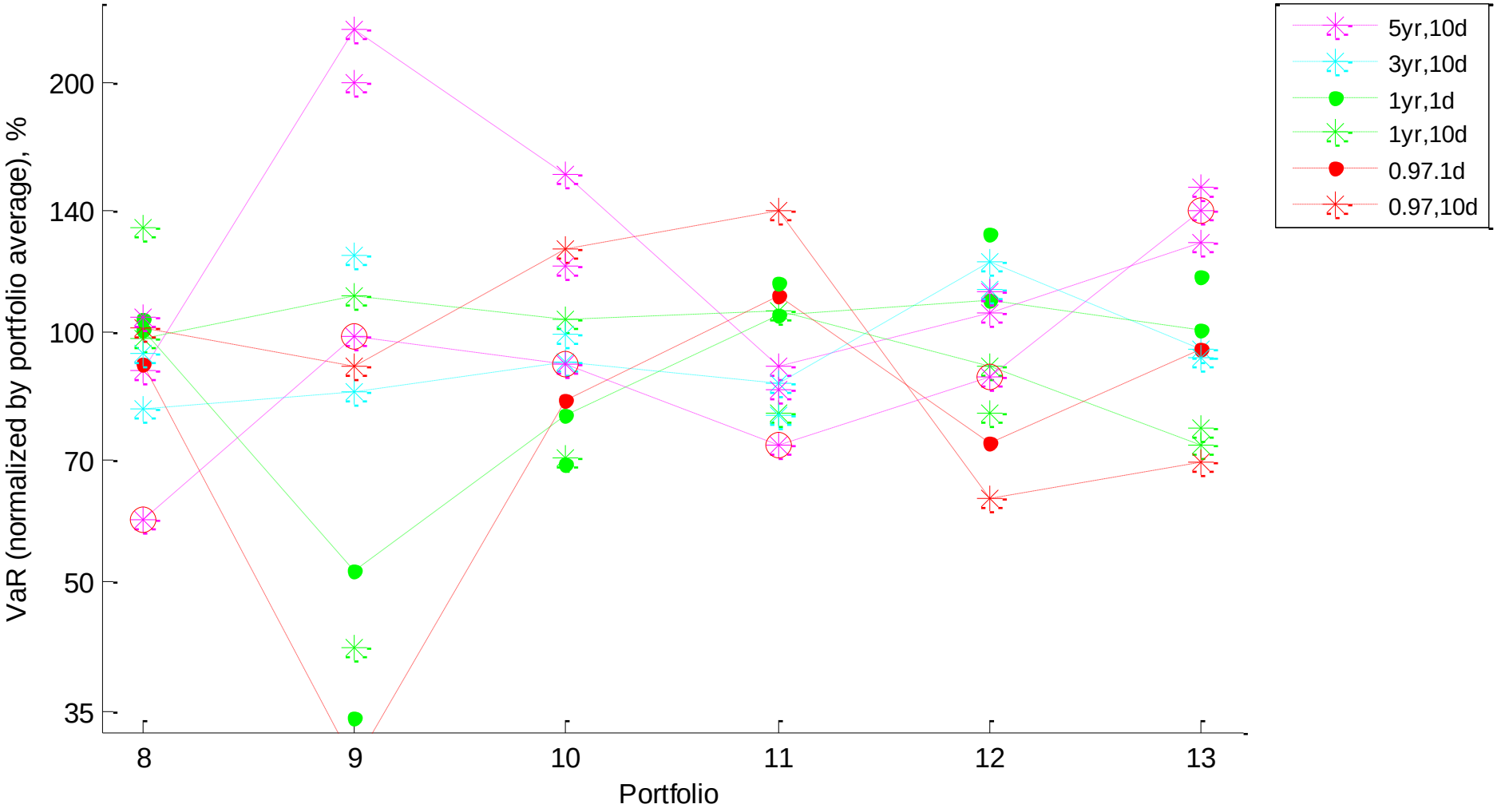
Value at Risk Across All Portfolios



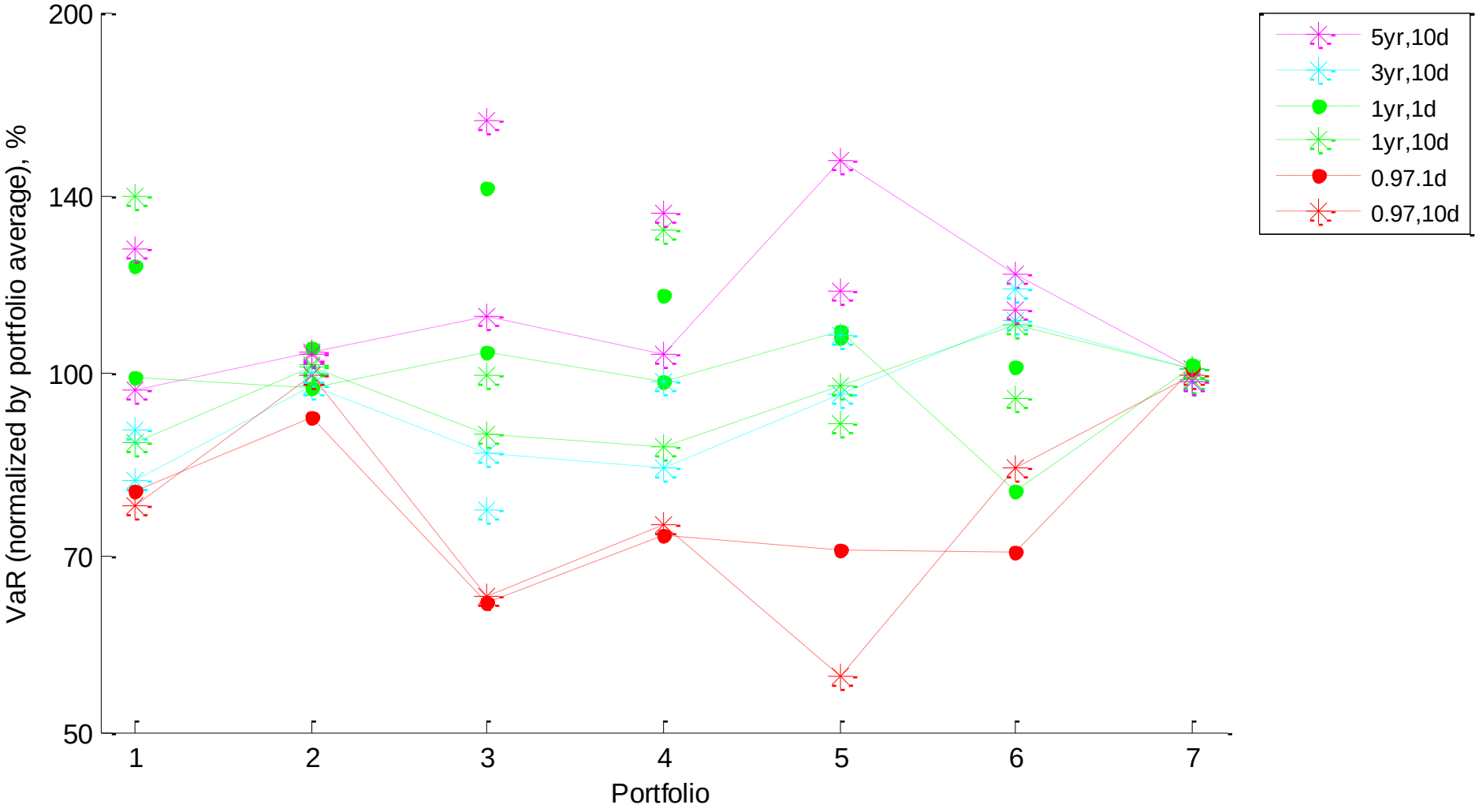
Interest Rates
Large Dispersion for Portfolio 9 (10yr Euribor Swap)



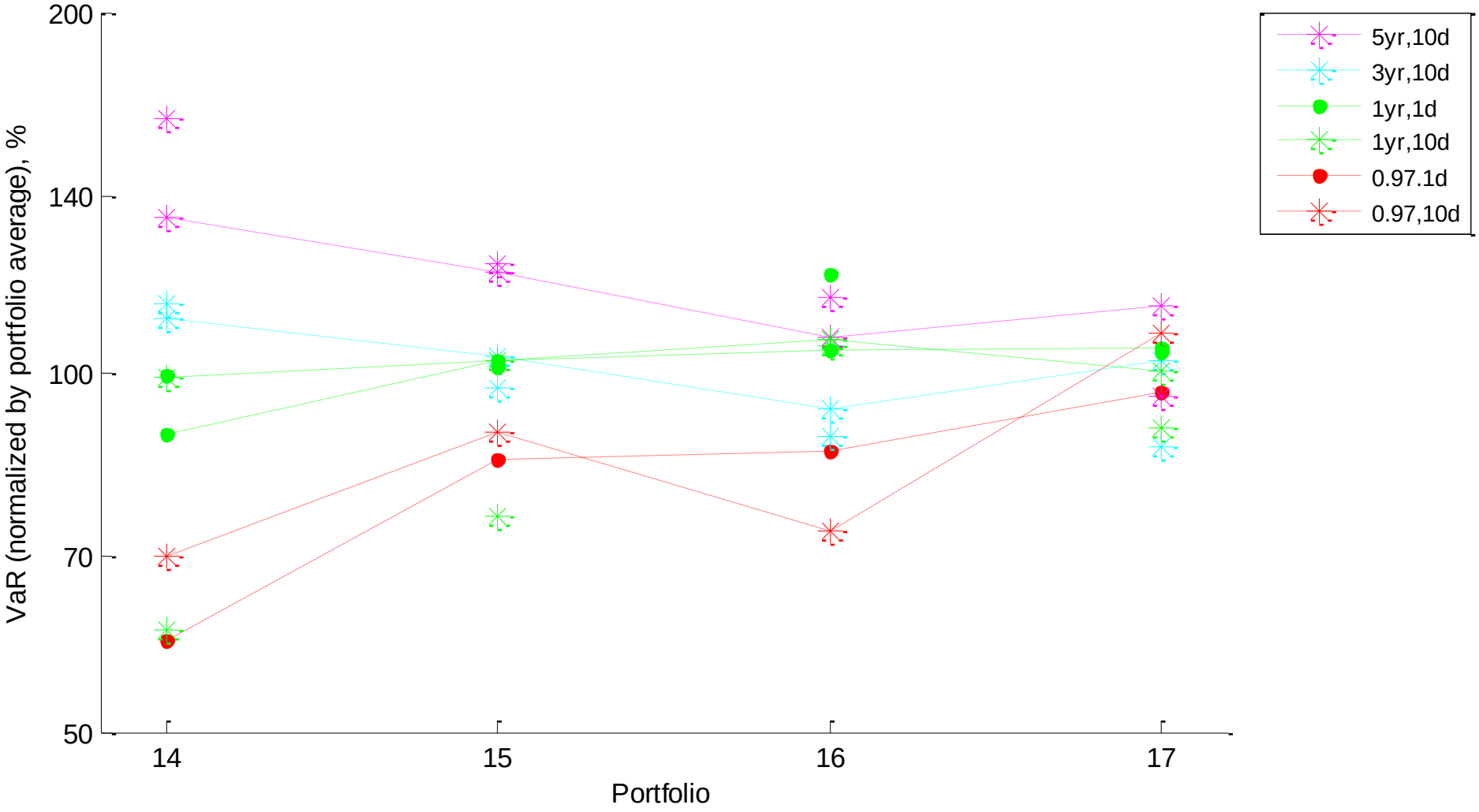
For Long Lookback, Switching to Lognormal Rates Has a Significant Impact



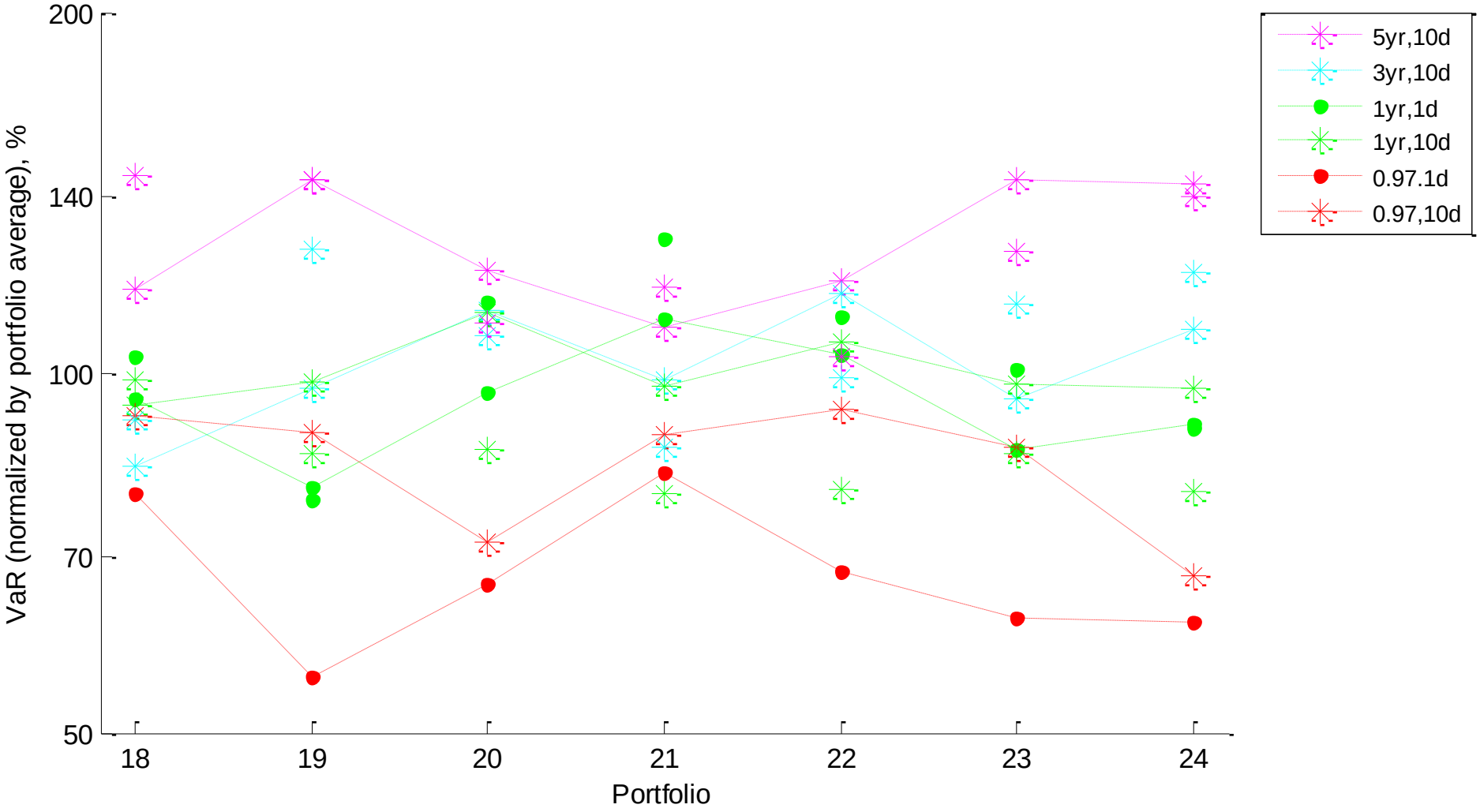
Equity



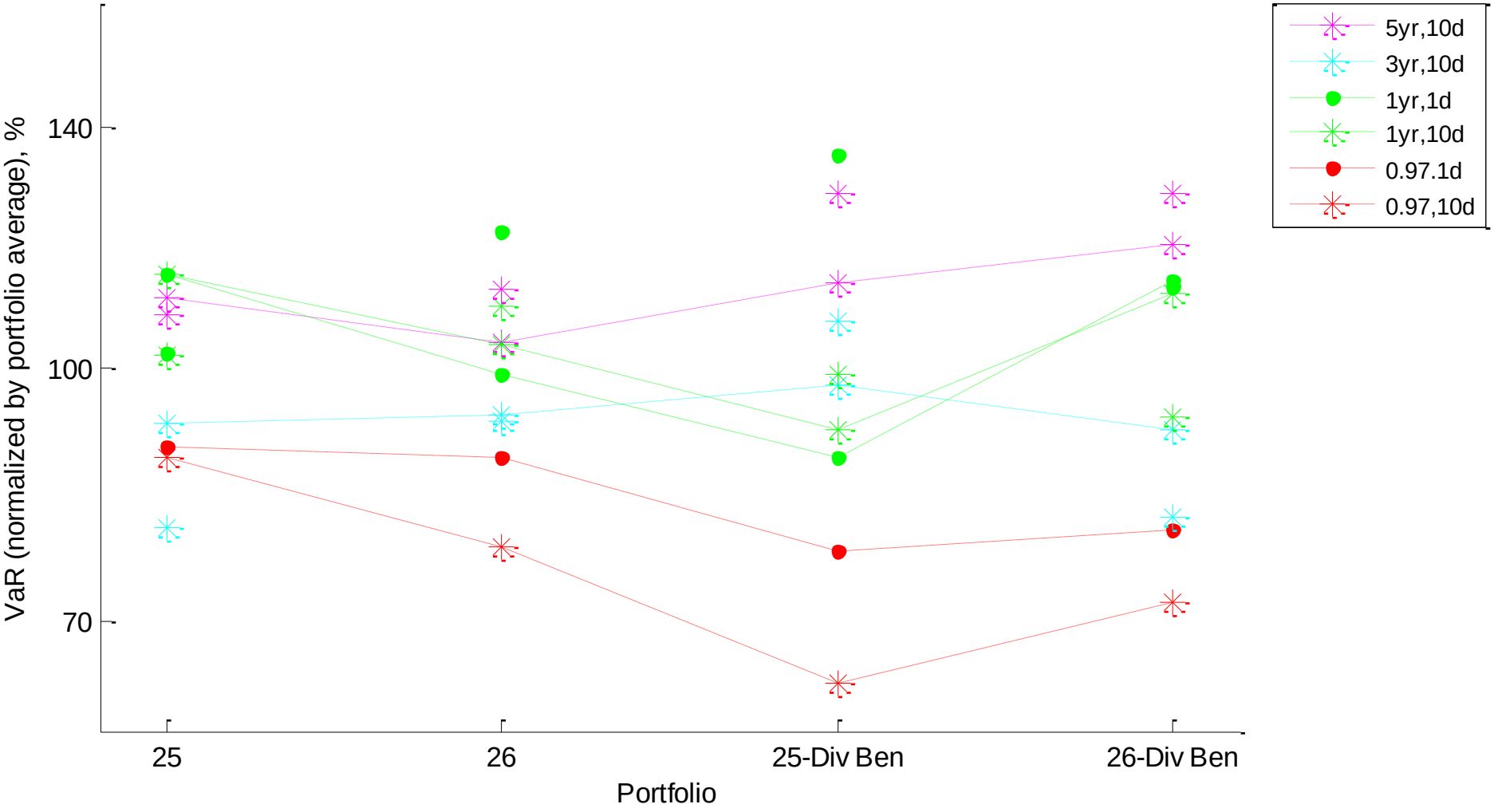
Foreign Exchange, Commodities



Credit Spreads



Surprisingly, Large Diversification Benefit Tends to Go With Large Portfolio Risk



Observations From the Complementary Study

- Overall …
  - The dispersion in results across risk models is less than the dispersion across banks
  - Risk rankings are persistent across risk models, evidence of a systematic bias
  - A switch to Expected Shortfall has very little impact
- Specific portfolios …
  - Portfolios 7 (barrier option) and 8 (curve flattener) – lower dispersion across models than across banks; dependence on pricing model and risk factor choice
  - Portfolio 9 (IR swap) – greater dispersion across models than across banks
  - Large, consistent dispersion for FX portfolios
  - Consistent dispersion across credit spread portfolios
- Importance of model assumptions …
  - Agree with Basel study that lookback period is crucial
  - Choice of return definition can play a large role, depending on lookback period
  - Choice of risk methodology plays a greater role than the bank study suggests
  - Choice of scaling methodology plays a smaller role than the bank study suggests

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Jan 2013

RiskMetrics Group

Research Monthly

VaR Is From Mars, Capital Is From Venus

April 2009

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In February, we commented on a Basel Committee proposal to implement a capital charge (the Incremental Risk Charge, or IRC) to cover default and migration losses in the trading book. Last month, the Financial Services Authority (FSA) of the UK released the Turner Review, an analysis of the origins of our financial crisis and recommendations for the future of financial services regulation, along with a discussion paper stating a more official FSA policy stance. Unlike the detailed proposal for the IRC, the FSA documents represent a broader review of regulation and capital generally.

Neither FSA document is guarded in its assessment of financial supervisors in the runup to the crisis. The discussion paper summarizes:

> . . . prudential regulation was too weak at a micro-prudential level, and almost completely lacking at a macro-prudential level. (Paragraph 4.2)

Central to the calls for macro-prudential regulation is the reaffirmation of the supervisors' role in ensuring the stability of the financial system. The papers propose that regulators take an active role in identifying systemic risks—easing of credit standards, rising systemic leverage, falling risk premia—through both macroeconomic analysis and knowledge of the actions of specific institutions. This is an ambitious step, broadening the mandate for regulation generally, but also requiring cooperation between the different agencies that today perform macroeconomic and institution specific analyses.

For the micro-prudential level—the supervision of individual institutions—the strongest call is for a "fundamental review" of the existing minimum capital rules. The tone of the papers make clear that the FSA holds strong views on where this review should take us. As for Value-at-Risk (VaR) models, the FSA states that the burden of proof lies with the industry to show that VaR is appropriate for capital rules.

But such a challenge sets up the review as a (potentially one-sided) discussion focused on the merits (or demerits) of VaR. This is far less productive than starting with a review of what trading book capital should be, with the notion that if a short-term measure of risk is appropriate, then VaR should prove its place. Our aim in this note, then, is to address some of the wrong reasons the FSA has put forth to cast VaR aside, offer some good reasons of our own, and comment on where short-term risk measures could contribute in a future trading book capital framework.

What went wrong?

Both FSA documents begin with the same chapter entitled "What went wrong?" The chapter reviews

the macroeconomic environment and the growth of the securitized credit model, and then moves to the now obligatory section on "Misplaced reliance on sophisticated maths". Central to this section is an exhibit (Box 1A in the Turner Review) summarizing in three main points the FSA views on the deficiencies of VaR-based estimates of risk.

One of the three VaR deficiencies is the "failure to capture fat-tail risks", which is further elaborated:

> Short-term observation periods plus assumption of normal distribution can lead to large underestimation of probability of extreme loss events.

While the symptom here (extreme loss events were underestimated) is uncontroversial, both aspects of the diagnosis are misguided.

To be clear, VaR models are intended to forecast (in a statistical sense) the possible loss on today's portfolio, based on today's market, over a short (one day to one month, for instance) risk horizon. Almost always, these models rely on historical price moves and some statistical inference to perform forecasting. In regulatory language, VaR by definition is a point-in-time measure.

One implication is that VaR models are verifiable: we can track both our forecasts of possible loss and the actual loss experience over time, and validate whether these two have the statistical relationship that they should. Banks perform this backtesting as part of their regulatory and disclosure requirements. Among the standard metrics is the number of VaR exceptions, that is, the number of days on which actual trading losses exceeded the VaR forecast.

Campbell (2009) recently surveyed bank VaR disclosure for 2008. Even in such an eventful year, there was a wide range of model performance. One of the better performers, Bank of America, reported two VaR exceptions at 99% confidence, almost precisely what one would expect. This was an improvement on the bank model's performance in 2007, which the bank attributed to their move to more frequent data updates in an effort to react more rapidly to higher volatility. In fact, this move to more reactive volatility measures was one of the best practices cited by the Senior Supervisors Group (SSG) in March 2008. This example also shows that good backtesting results do not guarantee that a bank had a peaceful year.

At the other end of the spectrum was UBS, which recorded 50 exceptions at 99% confidence. In other words, UBS observed what they thought was a one-in-a-hundred event on average once per week, a spectacular failure in risk forecasting. One of the bank's comments on this poor performance was to assert that their results "highlight the limitations of VaR". Such a broad dismissal of risk forecasting based is especially feeble in light of other banks' success.

A closer look at the UBS disclosure is illuminating. In its annual report, the bank discloses that it utilizes five years of historical returns, with equal weighting, to produce its VaR forecasts. It warns that this method "does not respond quickly to periods of heightened volatility". Indeed.

Thus, consistent with the SSG's recommendations, but at odds with the FSA evaluation, it was *long* observation periods that led to underestimation of risks. In the short term, risk changes, and risk models must react. The use of short[1] observation periods for VaR

[1] Or effectively short, in the case that past data is weighted unequally

forecasting is necessary to make good forecasts, and not just a convenient choice that lets us save money on data storage.

False relics

This brings us to the second part of the diagnosis—the use of the infamous normal distribution—which has been fodder for a thousand popular press vilifications of risk models. While it is true that the normal distribution is an oversimplification of empirical loss experience, the continued burning in effigy of Karl Friedrich Gauss has distracted the dialogue from numerous other points. And while we can ignore the counterproductive dialogue in the tabloid press or chat forums, the regulatory dialogue is more important. Unfortunately, to be heard above the din, a bit of yelling is in order.

First, any discussion of probability distribution (the description of our ignorance) must come only after using the available information to forecast what we can, in this case volatility. If asked to propose a distribution of the heights of a group of school children, it would be absurd to start deriving tail exponents before asking how old the children were.

Second, criticisms of the normal distribution are not new, and there exist numerous VaR model implementations that use alternatives. Not all of these are improvements, however. Those that use non-normal distributions but do not forecast changes in volatility perform categorically worse than those that stick with the beleaguered normal distribution but react appropriately to changing market conditions.

Third, the search for the right fat-tailed distribution at best gives us a more accurate view of the static part of our risks. As such, it is in some ways equivalent to shrugging our shoulders and saying "Shit happens". Maybe we recognize that market moves of ten times our volatility forecast are significantly more likely than we thought, not one-in-a-billion events but one-in-a-thousand events. But this teaches us nothing about the dynamics of the market we are trading, and gives us no warning signals of when those events are becoming even more plausible. The plea for the right fat-tailed distribution is the medieval response to the Plague, not to understand hygiene, germs or contagion, but to blame misfortune on the unknowable and immeasurable. This reaction is dangerous, as it presupposes not only that we don't know, but that we can't know. Our only hope is to trust in someone endowed with divine knowledge of the unknowably improbable.

Bigger distractions

The most dangerous distraction then is from an Enlightenment response to the Plague—a real analysis of what could have made underestimations of risk better, not just by making them larger, but by making them more timely. There are two crucial areas which have been all too often ignored. To their credit, the FSA does focus on one of these.

The second of the VaR deficiencies is "Failure to capture systemic risk", in which the FSA cites the assumption that "each institution is an individual agent whose actions do not themselves affect the market", and asserts that "interconnected market events can produce self-reinforcing cycles which models do not capture". This is potentially a much more productive

discussion than that of fat-tailed distributions, as it leads us away from a view purely based on historical returns data, and holds the promise of more than just larger risk estimates overall, but more timely signals of when risk has increased.

In fact, the language here lets us resolve one of the damaging rhetorical corners that the risk community has painted itself into. It is common to state that VaR models work in "normal markets", but without ever defining what "normal markets" are. The lack of a good definition turns what could be a useful guidepost into a useless circular statement: models work in normal markets, and normal markets are defined as those within which models work.

A better definition of a normal market is one in which the assumption mentioned above holds: institutions' actions do not themselves affect the market, and all market participants are purely victims of a set of exogenous price processes. In this regime, it is reasonable to expect that the historical data is sufficient as a basis for forecasting, and that VaR models will provide timely and accurate indicators of risk.[2]

To illustrate what we would call a non-normal market, consider the dislocation in tranched credit derivatives in 2005. The first two tranches of the North American credit derivatives index (CDX) typically exhibit a very tight relationship, with correlations in the 80-90% range. There is a fundamental reason for this, as the two tranches represent protection on the same underlying portfolio, albeit against different levels of loss. In the first two weeks of May 2005, however, the tranches moved significantly against each other, without the price of the underlying index moving much, causing heavy losses for investors with (seemingly) hedged positions across the two tranches.

This was a case where no model based on historical data would have foreseen the losses to come. Though a savvy risk manager would have known that the relationship between the two tranches was not perfect, and that such a dislocation was possible in theory, no historical precedent existed for the magnitude of the losses. This is not, however, a case where we shrug our shoulders and mumble about fat tails.

In the aftermath, it became clear that there had been a large buildup in positions that were short protection on the first tranche and long protection on the second. In such a position, a trader would reap a net quarterly premium and be hedged against moves in the underlying portfolio, or so it seemed. But with many investors in the same trade, the inevitable happened. Sparked by an event external to the tranche market (likely the earlier downgrades of Ford and GM), an initial set of investors closed their positions, pushing the prices of the two tranches apart and causing mark-to-market losses for those still holding the position; this sparked more position closing, which led to greater losses, and so on. In the end, this was a classic example of a crowded trade.[3]

But with no historical precedent, was there anything risk managers could do? Possibly. Market makers in these derivatives, themselves advocates for the "hedged" trade, could see the market flows leading to the crowded trade, prompting perhaps an investi-

[2] To be clear, we use the word normal here in its generic sense, meaning typical or regular. Market returns could well be non-normally distributed; all we are claiming is that useful statistical inference from historical data is possible.

[3] See Finger (2005) for more detailed analysis.

gation of their own positioning and susceptibility to a rush-to-the-exits scenario. Outside of flow desks, in 2005, there may have been nothing but market rumors to provide such insight. Today, however, the situation has improved.

The Depository Trust Clearing Corporation (DTCC) began in the fall of 2008 to provide weekly snapshots of the market exposures in credit default swaps, credit indices and tranches. For some of these products, the reports are granular enough to note changes in exposure on individual contracts. For tranches, this is not yet the case, but it is not far fetched to believe the members of the DTCC will agree to make this level of detail available in the future. Notably, this is true for an over-the-counter market which does not (yet) operate with a central counterparty.

In short, the FSA is correct to criticize the current generation of VaR models for their inability to uncover systemic risk or contagion effects. The data and tools to uncover such effects are closer than we might think, and should be the subject of significant attention in any regulatory review.

A new backtest

One year ago, we wrote in praise of the SSG for recognizing the description of positions in a risk model as just as crucial as the volatility model or distributional assumption. Neither FSA document makes enough mention of this point. This is the second casualty of the fat-tailed distraction.

The most overlooked source of bad VaR forecasts is the failure to adequately describe trading positions. This can take the form of a missing risk factor—assuming the basis between two similar instruments or the spread on a risky bond is constant—or a poor proxy choice—utilizing corporate bond yields to describe the risk of a securitization with comparable rating. As the SSG pointed out in early 2008, and as continued to be the case, it was modeling the wrong (or no) risk factors that was the root of the worst understatements of risk, not the choice of the wrong statistical distribution. The lack of coverage of credit risk in the trading book—what the IRC proposes to address—is a version of this same problem.

There are statistical arguments to tell us how many exceptions we should see in theory, assuming VaR models work as advertised. And there is a history of disclosure on simple, standard backtesting measures. We have a sense for how many exceptions the industry experiences, and know for instance that at 99% confidence, two VaR exceptions in a year is expected, eight is fair but slightly concerning and fifty is outrageous.

We propose that the description of instruments for risk purposes be backtested in their own right, independently of the statistical models used to forecast changes, and that the risk community establish a set of simple benchmarks for these tests. One candidate for such a benchmark is to compare over time the actual market price changes on an instrument to the price changes that would appear in the risk model, with whatever assumptions (proxy factors, constant spreads, linear price relationships) that might be entailed. Simple correlations of these changes, averaged across asset classes, would provide a first indicator of the quality of instrument representation.

Of course, this sort of backtesting is only possible if

we have actual market prices to compare. The absence of such prices, and the inability to perform the proposed backtesting, could be used as criteria to exclude instruments from a model-based capital framework, or from regulatory trading book consideration.

This is essentially the argument used (lack of prices, unclear pricing models and risk factors) for excluding securitizations from trading book consideration, both in the FSA's proposed capital review and the Basel Committee's IRC proposal. We are in agreement with this specific decision at the present time, but recommend that regulators and industry formalize what is expected for securitizations, or any instrument, to earn trading book treatment in the future.

Moving to procylicality

The last of the VaR deficiencies is that the procyclicality of VaR contributed to excessive risk taking in the period prior to the crisis. A procyclical capital framework is one that reinforces business cycles, requiring less capital when times appear good—encouraging greater risk taking—and more capital as the economy contracts—constraining banks' ability to lend and working against economic growth. Alongside this point, there is a demonstration that VaR based on short histories will produce such procyclical capital requirements. The solution is to use longer historical periods, exactly as UBS did. Once again, the symptom is correct, but not the diagnosis.

The conflict between the needs of capital and the output of VaR has existed since VaR first became part of the capital regime. The regulators have responded to this by placing restrictions on VaR models, in an effort to embed into VaR the properties that are desirable of regulatory capital. The call for longer observation periods in order to eliminate procyclicality is a continuation of this mindset. So is the recent proposal of the Basel Committee to apply risk forecasts from a turbulent period to the positions of today, in order to calculate a so-called stressed VaR.

The restrictions on VaR have not worked in the past—trading book capital under the current regime is still flawed—and further restrictions are unlikely to make it work in the future. At the same time, the UBS example demonstrates that VaR models that hew closely to regulatory desires perform poorly as risk forecasters. The effort to make a desirable capital rule out of a good risk forecasting model has resulted in something that is neither.

Looking to the horizon

The bottom line is that short-horizon risk forecasts should be procyclical, and efforts to dampen this produce worse forecasts. But two weeks is too short a horizon over which to set prudential capital. The horizons over which procyclicality matters are measured in quarters or years, not days or weeks. For an institution or a system to build up risks over this type of horizon, it is not enough for a portfolio at a specific point in time to go bad (something VaR might warn against); rather, the systemic risks are a result of institutions' reactions to an evolving market.

So the fundamental question for the fundamental review is how to define minimum capital for trading books such that the regime is risk sensitive, is countercyclical (or at least, not procyclical) and protects

not just a fixed portfolio, but rather an institution as a going concern. While VaR on its own satisfies the first of these requirements, it is incompatible with the second, and by construction inappropriate for the third. There is a strong argument, then, for moving away from a capital requirement defined as a multiple of VaR, not because VaR fails to perform as advertised, but because it succeeds.

If we accept VaR for what it is, there may be a role for the measure in a new capital regime, even if not the central role it plays today. And if not, the regulators should still emphasize that institutions should measure, manage and disclose the short-term risks in their trading portfolios. In either case, regulators should allow banks the freedom to build models that best forecast short-term risk. In return, banks should not only demonstrate adequate statistical performance of their risk forecasts, but also an acceptable link between any position's representation in the risk model and its actual market prices.

Finally, some short-term events can in fact produce systemic risks: crowded trades, contagion, liquidity shocks, the transition to non-normal markets. Signals for these should become part of the supervisory arsenal. But far from giving up and bucketing all of these as unknowable fat tails, we should be seeking indicators of when market imbalances have made these dynamics more likely. Regulators, banks and the rest of the financial community should share in this task.

Further reading

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