

Chief Risk Officer Forum



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Liquidity Risk Management Best Risk Management Practices



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The Chief Risk Officer Forum (CRO Forum) comprises risk officers of the major European insurance companies and financial conglomerates. It is a professional group that was formed to develop and promote industry best practices by working jointly to address key risk-related issues facing the industry. The membership is shown below.

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1. Executive Summary

Liquidity risk has been a major contributor to insolvency in the financial services industry in the past and as a result remains a key risk to manage for the future. This paper recommends best liquidity risk management practices for the (re)insurance industry.

Liquidity Risk can be generically defined as the risk that cash sources are insufficient to meet cash needs under either current conditions or possible future environments. At the heart of effective liquidity measurement is a clear understanding of a company's cash sources and cash needs.

The CRO Forum believes that liquidity risk is a risk that must be managed closely both in normal operating environments as well as under the occurrence of extreme liquidity risk circumstances. We believe that liquidity risk is unique to every company and any liquidity risk management program must take into account the characteristics of the specific (re)insurers' assets and liabilities in addition to other internal factors such as policyholder servicing and distribution and external factors such as the insurance and capital markets in which the company operates.

We believe that adequate liquidity (whether from internal or external sources) must be maintained at all times to manage through even extreme liquidity risk events and that it is inappropriate to expect any amount of required capital to protect against insolvency arising from this risk. The best line of defence is a strong liquidity policy and management framework where liquidity risk is robustly measured, monitored, and managed. This framework should include an operational plan to help the company manage through liquidity stress conditions.

The CRO Forum is pleased to offer this paper on our view on best risk management practices. It is our hope that this contribution will strengthen the risk management practices in the (re)insurance industry and improve the knowledge of risk professionals globally.



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2. Introduction

This paper is part of a series of work by the CRO Forum under their Best Risk Management Practices initiative. The paper outlines important principles and considerations that should be part of best risk management practice for the management of liquidity risk within an insurance company. The primary focus of this paper is the management of liquidity risk where the company bears the risk, as opposed to the policyholder.

More specifically, this paper:

- Set the principles guiding the development of this paper
- Defines liquidity risk
- Describes effective liquidity risk management, covering
- The importance of product design
- Implications for portfolio construction
- Measurement of liquidity risk
- Liquidity risk in policyholder funds
- Development of a liquidity policy
- Preparedness for a liquidity crisis
- How to think about liquidity risk in the context of required capital

Lastly, examples of liquidity testing and liquidity risk reporting are provided in appendices.

The details of companies' liquidity risk management efforts will vary in their specifics from one company to another. Practices will depend on each company's insurance product portfolio, company organisation, cash management practices, and management's risk tolerance, among other factors. Importantly, however, there are common principles and guidelines that should be considered when establishing best liquidity risk management practices within each company, and it is these on which this paper is focused.



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3. Principles of Liquidity Risk Management

The CRO Forum believes the following principles underlie the establishment of best practices for the management of liquidity risk within insurance companies. Each of the principles is developed more fully in the remainder of this paper.

Principle 1

Liquidity risk is an asset / liability concern; it is neither solely an asset risk nor a liability risk. Effective liquidity risk management starts with a careful assessment of the liquidity characteristics of a company's assets and liabilities, and a realistic assessment of any potential liquidity mismatches.

Principle 2

Management should set its tolerance for liquidity risk by using qualitative and quantitative tools, including consideration for its tolerance of other risks. Management must understand where the company is vulnerable to liquidity risk in order to set this tolerance.

Principle 3

The cost of securing adequate liquidity should be reflected in product design and valuation. Necessary liquidity can be provided through liability product design as well as by the investment portfolio backing the products and / or through external or contingent lines.

Principle 4

A company's strategic asset allocation and contingent liquidity planning should directly reflect the expected and contingent liquidity needs of its liabilities and potential sudden extreme shifts of liquidity in the financial markets.

Principle 5

A company should manage its access to the financial markets and have an ongoing presence in its chosen funding channels. It should regularly gauge its capacity to use these channels in order to better monitor the liquidity value of its assets and to safeguard its reputation during times of stress.

Principle 6

Management should require that a written liquidity risk policy be maintained. The policy should be approved by senior management and reviewed regularly to ensure it remains current and operational.

Principle 7

A company should maintain a written liquidity stress management plan that is approved by senior management. The plan should reflect the company's advance planning for times of liquidity stress, and will guide the company's management actions during a liquidity crisis.

Principle 8

Requiring capital to provide for liquidity risk is an ineffective means of managing this risk. Liquidity risk is a risk to be managed at all times – before, during, and after any stress event – and no amount of capital can replace comprehensive liquidity risk management.



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4. Sources of Liquidity Risk

Liquidity Risk can be generically defined as the risk that cash sources are insufficient to meet cash needs under either current conditions or possible future environments.

In this context, Cash Sources reflect cash inflows from insurance products (future premiums and deposits), asset cash flows, sales of assets, and contingent liquidity sources. A company's Cash Needs are driven by product cash outflows (whether expected or unexpected), operating cash outflows, and contingent cash needs arising from environmentally-driven factors. The Liquidity Coverage Ratio is defined as the ratio of Cash Sources to Cash Needs.

Effective liquidity risk management critically depends on a clear understanding and considerable reflection on both the company's sources and uses of cash as well as available, unencumbered assets that can be readily monetised to satisfy imminent financial obligations.

Principle 1

Liquidity risk is an asset / liability concern; it is neither solely an asset risk nor a liability risk. Effective liquidity risk management starts with a careful assessment of the liquidity characteristics of a company's assets and liabilities, and a realistic assessment of any potential liquidity mismatches.



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5. Liquidity Management

This section first covers data and system integrity and internal controls. We then cover product design and portfolio construction. We then move to a description of the building blocks of liquidity measurement. Liquidity measurement and associated processes serve as the basis for the formulation of a Liquidity Policy. We also cover the importance of advance planning for a potential liquidity crisis, and discuss several elements that should be part of any well-designed plan.

5.1. Data and System Integrity

In liquidity risk management, effective decision making relies on timely, accurate and meaningful data. To the extent that remediation efforts are encumbered by fractured information systems, compensating manual controls and other required interventions, progress will be inhibited. To this end, liquidity risk management programs should promote critical assessments of key information systems through internal control assessments and internal and external audits.

5.2. Management Tolerance for Risk

Effective risk management begins with an identification of the risks (including liquidity risk) an organisation faces and analysing each risk, the associated returns, and their interdependencies. In this way management can make an informed statement of risk tolerance, constrained by the company's resources to absorb risk.

Principle 2

Management should set its tolerance for liquidity risk by using qualitative and quantitative tools, including consideration for its tolerance for other risks. Management must understand where the company is vulnerable to liquidity risk in order to set this tolerance.

Quantifying company tolerance for any risk is not a simple task. It is even more challenging for liquidity risk given it does not lend itself to analytical methods in the same way or to the same extent as do, for example, credit or market risks. Because of this it can be hard to directly compare liquidity risk to other risks.

As a result, a company's management will sometimes find it most effective to express liquidity risk tolerance in qualitative terms which can then be translated to quantitative limits and liquidity stress testing. However expressed, company efforts expended to guard against a technical insolvency arising from liquidity risk should be just as stringent as those expended to guard against economic insolvency arising from other risks.

5.3. Product Design

When managing liquidity risk in an insurance company, it is important that this begin with insurance product design. The CRO Forum believes that insurance products should either be self-supporting from a liquidity perspective or should factor in additional liquidity support needed.

Principle 3

The cost of securing adequate liquidity should be reflected in product design and valuation. Necessary liquidity can be provided through liability product design as well as by the investment portfolio backing the products and / or through external or contingent lines.



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Product design should anticipate the investment portfolio construction that will be employed to back product issuance. To the extent the investment portfolio being employed may not provide for all cash needs under all expected and stressed liquidity scenarios, additional liquidity (cash sources) may need to be secured. If this is the case, the cost of securing these sources should be reflected in product design and pricing. This will encourage a discipline of rational product pricing and premium-setting. The critical point is that concentration risk in products with high liquidity needs should be addressed, either by ensuring sufficient liquidity in investment portfolio construction, or by securing adequate and reliable liquidity external to the portfolio.

When aggregating liquidity risk across a legal entity or portfolio, the potential liquidity needs of all products will likely diversify to some extent. The amount of external liquidity support needed for a legal entity should take into consideration aggregate liquidity needs of the entity, factoring legal and regulatory constraints and reflecting any diversification benefit between individual product lines.

Clearly, product design should take into consideration the potential for cash outflows. In order to manage liquidity risk, product design should generally encourage the preservation of customer balances and by managing claims concentration. Some product designs involve granting the customer a withdrawal option. This withdrawal option can come in the form of partial or full surrender, cessation of premiums, utilisation of policy loans, and other forms. Whether these withdrawal options come from market practice or regulatory requirements, they often come at a liquidity-driven cost. Absent a company's well-reasoned argument to the contrary, best practice would suggest this cost be borne by the products that produce the risk.

For example, under some product designs a policyholder has an option to withdraw cash value that is built up at amortised cost under the policy (sometimes after the imposition of a surrender penalty). This option comes at a cost to the company, as it will likely need to maintain a more liquid asset profile in view of the fact that such demands can be made. The company is clearly not indifferent between products having such withdrawal / surrender rights and those that do not. These differences should be reflected in product pricing, taking into consideration management's tolerance for the balance of products sold.

Effectively managing liquidity risk involves the prudent management of both the asset portfolio and the product portfolio. Adhering to a properly constructed liquidity management policy ensures that all cash outflows can be provided for, even under adverse conditions, thereby avoiding a "fire" sale of assets which could potentially lead to an insolvency of the company.

It should perhaps be noted that the liquidity risk present in the product portfolios of insurance companies is typically not as great as banks' demand-deposit businesses. Many insurance products have premium payments that span many years in order to support long term benefit needs. This better alignment between funding the benefits and ultimate payment of benefits reduces liquidity risk substantially in these products. Even for insurance products that are of a savings/investment nature, liquidity risk is significantly lower than under banking products due to the presence of liquidity risk-mitigating provisions within most retail and some institutional insurance products. Some examples include: tax and surrender penalties; up front costs of replacement products; need to undergo underwriting procedures; and many more.

5.4. Investment Portfolio Construction

As with all risks, it is important to understand liquidity risk at a Group level taking into account all Cash Sources and Needs whether certain or contingent. However, even within a consolidated group setting liquidity risk also needs to be measured and managed at a legal



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entity portfolio level. This is because cash and liquid securities can be entity-specific, and it may not be possible to transfer funds between entities, especially in times of liquidity distress.

As noted in the previous section, unless a company secures additional liquidity from an external source, the assets backing product liabilities should be able to provide enough cash to cover all cash needs, both under normal and stressed conditions. In either case, investment portfolio construction needs to consider the liquidity needs of its product liabilities. More generally, a company's strategic asset allocation should directly reflect the liquidity needs of its liabilities.

Principle 4

A company's strategic asset allocation and contingent liquidity planning should directly reflect the expected and contingent liquidity needs of its liabilities, as well as potential sudden and / or extreme shifts of liquidity in the financial markets.

Some products have few or no unscheduled cash demands. These normally present fewer challenges to constructing asset portfolios that provide sufficient liquidity. Other products have material potential cash demands that can vary widely in amount and timing, driven either by policyholder behaviour, triggers in contracts, or by catastrophic claims. For these, care must be taken when constructing asset portfolios, as in addition to providing reasonable interest rate matches for the liabilities, the assets chosen may need to be converted to cash if (and whenever) called upon.

Liquidity has substantial value in the market. Considering the value of liquidity, it is also important to try to "match" the liquidity sources within the asset portfolio to the liquidity needs on the liability side. What is critical is that this matching must satisfy not only expected outcomes but also extreme stress outcomes. Note that stress scenarios can be company-specific (e.g., concern with the financial condition of the company or claims concentration), industry-specific (e.g., concerns about the financial condition of the insurance sector or catastrophic claims), and / or the market in general (e.g., impaired capital markets). Furthermore, stresses can also come from a combination of policyholder behaviour, catastrophic claims and impaired capital markets as these risks have some interdependency.

When determining the liquidity embedded in asset portfolios one should err on the side of caution. History, some quite recent, has shown that asset classes traditionally viewed as quite liquid can temporarily turn surprisingly illiquid. This change can be sudden, and may not provide portfolio managers with sufficient warning to shift portfolio construction without incurring substantial cost. Additionally, periods of "temporary" illiquidity may last longer than one might expect.

5.5. Liquidity Measurement

At the heart of effective liquidity measurement is a clear understanding of a company's Cash Sources and Cash Needs. As discussed, it is vital that both are considered under a variety of environments. Cash Needs should therefore include all possible claims on cash from policyholders, shareholders, and operations. Some of these cash outflows are scheduled while others are known with much less certainty. Internal experts should be consulted when determining both the size and timing of expected and unexpected Cash Needs, and these estimates should be thoroughly vetted within the company.

With respect to establishing its liquidity sources, renewal premiums from existing products and potential new product sales are an important source of liquidity. The premium levels can vary considerably depending on the market environment and the financial condition (whether real or perceived) of the insurer. A company should also constantly monitor the liquidity value of its assets. The liquidity value is the amount of cash that can be obtained through different



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funding channels such as secured funding (repo, securities lending) or a sale of assets. Investment experts should be directly involved in estimating the expected and potential cash inflows arising from the asset portfolio. These cash flows can vary materially under different environments and so it is also critical that Cash Source estimates be prepared giving consideration to both amount and timing.

Principle 5

A company should manage its access to the financial markets and have an ongoing presence in its chosen funding channels. It should regularly gauge its capacity to use these channels in order to better monitor the liquidity value of its assets and to safeguard its reputation during times of stress.

Generating cash in- and out-flow estimates involves some level of subjectivity. It is important that risk management personnel have oversight responsibility in reviewing and approving these estimates. Additionally, to the extent possible, estimates should be compared to historical and actual company-specific and industry experience, to determine whether they reflect reasonable levels of cash in- and out-flow activity.

There are a number of ways to determine potential Cash Needs and Cash Sources under various scenarios. How a company chooses to project these amounts is a company-specific choice, and will depend on company infrastructure, organisation, modelling expertise, and risk practice. However, the method chosen should be one that the company knows to be reliable and produces results that are consistent with actual cash flow forecasts.

When assessing cash sources, investment professionals will be assessing the amount of assets that can be sold or cash generated (such as through securities lending activity) within certain periods. These assessments will need to be made for both current and stressed market conditions. It is important to be clear whether any deviation from market value is allowed when selling assets and to be specific as to this allowance to ensure consistency between investment professionals.

There will be a need to examine the amount of aggregate cash that is assumed to be generated, especially in the case of a medium- to large-sized company. A company might be tempted to assume that the aggregate available cash is simply the sum of the cash produced by each asset class. There are at least two reasons why this may be a faulty assumption. First, as assets are sold and cash is utilised, an eye should be kept on the remaining balance sheet construction, which will need to remain viable from a business and risk concentration perspective. This may mean scaling back the sale of certain asset classes to levels below those suggested by investment professionals. Second, “too much” selling by a company may well send a message of distress to the market, and the company may start to see offered prices for its assets that are well below fair value. Because of these reasons the company may want to reduce the amount of aggregate available cash to arrive at totals it believes to be both reasonable and supportable.

In developing these cash flow estimates, other potentially complicating factors can arise and require additional care, such as collateralization requirements under certain contracts. This is addressed in a later section.

5.5.1. Liquidity Stress Sources

In order to adequately assess the liquidity risk in a product line, business unit, legal entity or company, it is not sufficient to only consider “expected” Cash Needs. It is vital to examine cash flow behaviour under a variety of different scenarios. The goal should be to ensure sufficient liquidity in the asset portfolio, together with secured external cash sources, to



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provide for timely payment of potential cash demands under both normal business conditions and under extreme conditions resulting from unforeseen events.

In selecting scenarios to test, consideration should be given to any plausible combination of events that could cause liquidity stress. Bear in mind that although history can contribute to the development of liquidity stress scenarios, risk is about what has not happened rather than making preparations for the past occurring all over again. Sample scenario considerations include:

- Changing interest rates
- Company ratings downgrade
- Large claims resulting from a single or series of contagion events
- Liquidity needs arising from a large operational loss event
- Loss of control over a key distribution channel
- Sudden termination of a large reinsurance contract
- Impaired capital markets

In each of these cases, company experts should be consulted to consider how both the asset and product portfolios will be impacted. Specifically, how will cash inflows and outflows (from both the assets and the product liabilities) behave? Policyholder reaction as reflected in cash withdrawal levels must be considered.

Disintermediation, Downgrade and Behaviour

As interest rates rise and investment alternatives become increasingly attractive to insurance and annuity savings policyholders, the company may experience increasing withdrawal rates as clients seek newly priced products.

Depending upon a number of factors, including surrender options granted to policyholders, the size of new money rate increases, the variety and appeal of alternative investment choices, and the company's product preservation efforts, the magnitude of the resulting disintermediation could vary dramatically. There are many mitigating elements (tax penalties, surrender charges, proactive agent behaviour, etc.) that can help manage this risk, and these elements should be reflected when considering the extent of excess withdrawals due to rising rates. Still, excess withdrawals are possible and the company should be prepared to cover these excess cash demands should they arise. Note that the economic loss resulting from selling assets at market value to pay for "amortised cost" withdrawals should be reflected in interest rate risk quantification and management. However, the ability to meet these cash needs is a liquidity issue. The presence of book value surrender options and / or the absence of surrender penalties will also influence the withdrawal rates a company should expect to experience.

Another very important stress liquidity source to consider in managing liquidity risk is the risk of the company being downgraded by one or more notches from rating agencies. This may lead to reduced new product sales and elevated levels of customer withdrawals, or even prompt panic regarding the financial condition of the insurer. This scenario is more relevant for "rating sensitive" businesses such as institutional business, deposit based businesses and high net worth clients.

In some cases a company may be able to forestall large cash withdrawals by invoking deferral of payment or by posting collateral (although this too has liquidity implications as described below) if permitted by the contract or statutory law. In other cases there is little a company can do, as the institutional customer (a pension plan sponsor, for example) may have a contractual and fiduciary obligation to only invest with companies having a certain minimum rating.



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In considering this stress liquidity source, it is prudent for the company to assume that news of the downgrade spreads quickly and widely in local, national, and financial media. This widespread exposure can lead to further elevations in customer withdrawals and significant reductions in new product sales. Panic-level withdrawals can be facilitated by distribution channels, also, as they act to move business from one company to another on news of financial stress. The type of distribution can play an important role in this, as Independent Financial Advisors (IFAs), brokers, and bank distribution will typically pose greater panic withdrawal risk than tied agents and direct marketing distribution methods. In all these instances, it is the deterioration in the financial condition of the insurer (whether real or perceived) that leads to the “run on the book” scenario. It is prudent to consider that the financial distress of the company occurs at the same time as the capital markets are experienced impaired liquidity (see below).

Another potential source of liquidity risk is customer behaviour. Customer behaviour can be difficult to predict, and persistency behaviour has obvious direct implications for liquidity. Products with “heavy” savings elements or sophisticated policyholders (institutions or high net worth individuals) are more sensitive to the circumstances of the insurer and the market. Additionally, a company should be cautious about its predictions of persistency involving a new product design, a new distribution channel, or when a product design is exposed to a market environment to which it is new.

Catastrophic Claims

Another source of liquidity risk originates from large claims that must be paid over a relatively short period of time. The loss associated with the claim itself is of course an underwriting result but the ability to raise the cash necessary to pay claims when due is a liquidity concern. These catastrophic claims can come from various sources and the potential for related (a single event covering multiple lines) large claims should be considered.

The interdependency between natural or man-made catastrophes with their impact on capital markets should be considered, as some of these catastrophes may induce stress on financial markets, putting pressure on prices and / or market liquidity. In this instance, liquidity stress can come from more than one source simultaneously.

Another example where liquidity stress sources can be related is when the level of claims experienced by an insurer is very high which in turn can raise concerns in the market about its financial viability. If this same company were to have products that were at risk for policy surrender (as described above) then liquidity stress can be additive in the case the company's ratings were downgraded

One mitigation against catastrophic claims is to have a highly diversified business so that potential maximum claims are limited and a balance of risks is maintained taking into account the potential interdependency between risks. Also, where reinsurance is present, these agreements often have “cash loss clauses” where the direct writer can receive immediate payment from the reinsurer which would be credited later once final claims covered under the treaty are established.

Capital Markets Liquidity Impairment

While liquidity stress can be driven by elevated policyholder withdrawals, it can also be caused by impaired liquidity in capital markets. There have been several times in the recent past when this has occurred, and each of them carried liquidity implications for insurers. When previously liquid asset classes become temporarily illiquid or materially less liquid for an extended period of time, raising even nominal amounts of cash can prove to be difficult.



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It is therefore important to consider how the company will cope during a time when its ability to sell assets and raise cash is severely curtailed. This “impaired” capital markets liquidity stress source would be common to the financial services industry. It can be the most significant liquidity stress source to consider especially in combination with other related liquidity risk sources such as a company ratings downgrade.

5.5.2. Liquidity Stress Tests

Since each company’s circumstances are different, they should not be expected to contemplate the same liquidity stress tests. Scenarios should be designed considering the potential sources of liquidity risk that are specific to that company’s products, business and market in which they operate. This is especially true for liquidity sources such as disintermediation risk whereas impaired liquidity in capital markets should be more comparable between companies with the same liquidity risk tolerance.

It is important to evaluate each source of liquidity stress but it is the combination of liquidity stress events that may test the management limits of a company. By combining various product, asset, and market scenarios, stress tests that describe the “tail” liquidity risk facing a company can be described.

If properly defined, these can serve as a range of economic and business environments under which liquidity adequacy should be tested. In addition to testing liquidity adequacy in a “normal” environment (no change in company ratings, interest rate levels, capital markets, etc.), stress tests will test a company’s expected liquidity adequacy in extreme market and business conditions. Some common examples that may be appropriate to consider include the following:

- **Disintermediation Scenario**
This type of scenario could examine the amount and timing of increased withdrawal activity due to a sudden material rise in interest rates, such as 300 basis points. Heightened withdrawal activity would be expected from interest sensitive products, as previously described. Expected asset cash flows could be reduced due to lower expected prepayments on interest sensitive assets. Additionally, any assumed asset sales conducted to generate cash would result in lower proceeds due to depressed market values.
- **Catastrophic Claims Scenario**
This scenario could result in a mock application of one or several catastrophic events leading to unprecedented demands for cash over a short period of time. The overall amount and timing of claims are particularly important including the assumption when claims will ultimately be paid.
- **Customer Panic Scenario**
Building upon the stress of the Disintermediation or Catastrophic Claim scenarios, a Customer Panic Scenario might consider the added effect of a material company downgrade due to a sharp deterioration in its financial condition. Several potential capital and insurance market scenarios can bring about this deterioration such as falling equity markets, rising credit spreads and/or catastrophic insurance losses. The impact of these scenarios should also be reflected when modelling the Customer Panic Scenario. In order to fully reflect the potential ratings impact, it may be necessary to assume a full “letter” or greater downgrade, as it may require this amount of rating change to produce maximum conceivable policyholder demands for cash and greatly reduced or even zero new sales production as policyholders fear the safety of their investments. Note it is conceivable that in this scenario surrenderable-investment-oriented products (fixed



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annuities or pensions) experience full withdrawals to the extent allowed under the contracts. Less sensitive insurance-oriented products (whole life insurance) may experience a sharp increase in lapses but something less than a 100% exercise of their withdrawal options.

- **Impaired Markets Scenario**
This scenario is intended to address the possibility that it is, for a period of time, very difficult or even impossible to sell assets to raise cash. It assumes “frozen capital markets” for all asset classes except for the highest quality and most liquid, such as government bonds. Liquidity in other asset classes might be presumed frozen for a period of time, such as 3 to 6 months, for example. Normal liquidity may then be assumed to return to the markets only after a year or longer has passed.
- **Impaired Markets/Panic Withdrawal Scenario**
A company focused on prudent liquidity planning will want to examine how it expects to fare in a scenario involving a “run on the book” level of customer withdrawals and limited or no new product sales during a period when capital market liquidity has largely vanished. This level of stress may prove quite difficult to weather without access to external sources for cash, and so examination of this or similar scenarios may serve to inform management of the need to secure such alternative sources.

Stress scenarios such as these can be compared to a baseline scenario in which expected cash inflows and outflows from both assets and liabilities (existing and new sales) occur. Potential asset sales can be reflected at a pace that yields cash proceeds “close” to market levels to supplement the cash from expected asset cash flows. In doing so it is crucial that an orderly sale of assets be reflected.

One convenient and simple way of expressing the degree to which a company expects to cover its potential Cash Needs is in the form of a ratio. Under each scenario examined by the company, projected Cash Sources can be divided by projected Cash Needs to form the Liquidity Coverage Ratio. This metric can be calculated at all future time horizons corresponding to important measurement periods for the company. A reasonable set of horizons might be 7 days, 1 month, 3 months, 6 months, and 1 year. Achieving a Coverage Ratio exceeding 100% suggests the company expects to be able to fund its cumulative Cash Needs over that time horizon, under that scenario.

Note that once liquidity scenarios of increasing severity are developed and analysed, passing the most extreme scenario would mean passing intermediate scenarios. These intermediate scenarios are useful however in order to build an insight into the company’s liquidity risk.

5.5.3. Contingent Liquidity Sources

As a by product of its investment philosophy a company may choose to require that its portfolios provide adequate available cash to cover potential cash needs under many but not all plausible events and scenarios. Such a company should secure for itself adequate and reliable external cash sources to ensure it can cover its cash needs in all situations. Another company may instead require that its investment portfolios provide for all potential cash needs under all plausible scenarios. However, even this company should consider arranging cash lines that can be tapped in times of extreme stress liquidity events. This is because it is possible that an extremely unlikely event could take place that would cause the liquidity embedded in any company’s asset portfolio to be insufficient. It is therefore often necessary to proactively secure additional guaranteed lines of liquidity, to be utilised in such an emergency. These contingent sources should be held in reserve in the case that the



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company's liquidity modelling and prediction of the worst-case environment under represents the actual scenario a company encounters.

Contingent liquidity sources should also include a consideration of liquidity facilities that can provide options with respect to monetising otherwise illiquid assets, such as real estate holdings and other investment interests.

Contingent liquidity resources can take several forms, including uncommitted bank lines of credit, other standby or back-up liquidity lines, and the ability to issue new product on a guaranteed basis. Great care should be taken to ensure that these additional sources of liquidity are always available, even (especially) in times of extreme stress or insurer downgrade, whether market-wide or company-specific. An example would be to ensure there are no material adverse change clauses in a company's committed liquidity lines from banks.

5.5.4. Reflecting Collateral and Other Encumbered Assets

Contractual language associated with the issuance of certain products may require that, under certain conditions, assets must be posted to a collateral or trust account. Certain investment activity may have similar requirements, for different reasons. Required asset postings may be current or they may be contingent on the occurrence of specified future events, such as company downgrade. In any case, posted assets are not available to sell for the purpose of raising cash. In the "Customer Panic Scenario" described earlier, and in scenario testing more generally, it is important to reflect any additional collateralisation requirements that would be expected under the scenario being tested.

There are other reasons why other identified assets may not be available for sale. Bonds left on deposit to satisfy regulatory requirements is one example. As is the case with posted collateral, these assets should not be considered as potential cash sources until released from their encumbrance.

Further, in many cases an overcollateralization requirement exists which results in more assets being posted (for contingent purposes) to a trust account. Allowance for this phenomenon should also be made in liquidity planning and liquidity stress testing.

5.6. Liquidity Risk in Policyholder Funds

Although the primary focus of this paper is liquidity risk for the account of the company, liquidity risk can also be present for the account of policyholders (as is the case with policyholder funds) or with true separate accounts, where the policyholder bears the investment risks. Policyholders can be exposed to liquidity risk if the underlying investments are structurally illiquid, or if, in impaired markets, otherwise liquid assets become illiquid.

Liquidity risk in policyholder funds can generally be considered an operational risk, as the insurance company must ensure that all risks of the fund are adequately disclosed in the investment prospectus or insurance policy, for unit holders or policyholders, respectively. Liquidity management tools such as the ability to suspend withdrawals (except for hardship withdrawals) should also be considered. When a particular asset class is falling rapidly in value or there is much concern about potential future value loss, policyholders may start a run on the fund, forcing the fund manager to sell illiquid investments at "fire sale" prices. This can leave remaining fund holders having to take outsized losses for the benefit of those causing the run. To prevent this from occurring, the insurance company may have a fiduciary responsibility to suspend withdrawals to protect the broader unit and policyholder base.



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5.7. Liquidity Policy

If a company does not exercise sufficient, regular reviews and assessments of its liquidity position, it may run a dangerous risk of technical insolvency. Even if solvent from a balance sheet perspective, if there is insufficient ability to raise cash to meet obligations as they come due, the company could be forced to cease operations. In order to guard against this, and in keeping with good risk governance practices, a written liquidity policy should be developed, approved by senior management, and made operational.

Principle 6

Management should require that a written liquidity risk policy be maintained. The policy should be approved by senior management and reviewed regularly to ensure it remains current and operational.

A liquidity policy should define liquidity adequacy in the context of the company's risk philosophy and tolerances. The degree to which the company will expect to rely on external cash sources versus self-funding liquidity needs should be clearly described. The policy should specify minimum standards that the company must meet to consider itself to be adequately protected from liquidity risk, and also how frequently liquidity adequacy is to be measured.

Not all companies will address these points the same way. As noted in several places, the specific methods, scenarios, and processes a company employs to manage liquidity risk effectively must be tailored to the needs and philosophy of the company. For example, the frequency with which testing is done can vary by type of business, depending on the liquidity characteristics of the business (e.g. institutional versus retail). For some businesses, more frequent testing (such as monthly) may be required, whereas for other businesses, quarterly compliance may suffice. What is critical is that company's management be convinced that the specifics of its liquidity policy be appropriate given its own unique combination of products, investment portfolio construction, distribution channels, risk tolerance, etc.

In this context, minimum liquidity standards should be established, and cure periods prescribed if standards are not met. And as referenced above, the policy should require that appropriately selected stressed environment tests (stress tests) be passed, in addition to a normal conditions-test.

The liquidity policy should clearly describe the liquidity risk management organisation, clearly identifying responsibilities for setting strategy, risk limits, execution reporting and monitoring functions. It should state which departments are involved in liquidity risk management and which committees have oversight on liquidity risk matters.

Policy compliance should be determined on a regular basis and reported to senior management, preferably in the form of a senior risk committee, which should own and have approved the policy. In all cases, if standards are not met, then senior management should be notified and should approve a remediation plan designed to regain compliance without undue delay.

The liquidity policy should also define the requirements for liquidity crisis planning, which is defined in the next section.

5.8. Liquidity Crisis Planning

A well-designed liquidity policy will also reflect the company's advance planning for times of liquidity stress. Plans should be developed that will guide the company's management actions before a crisis arrives. There are several aspects of crisis planning which should be



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addressed. Among these are: the designation of a liquidity crisis management team, along with defined roles and responsibilities; the development of a process to repeatedly gather cash flow projections; and the design of appropriate internal and external lines of communication.

Principle 7

A company should maintain a written liquidity stress management plan that is approved by senior management. The plan should reflect the company's advance planning for times of liquidity stress, and will guide the company's management actions during a liquidity crisis.

An unfolding liquidity crisis needs to be managed both carefully and proactively. In order to coordinate this, a crisis management team should have been formed, with members that have direct contact with asset managers and product actuaries. In the event that a liquidity "event" occurs, this team should be convened without delay. One of its first tasks should be to determine whether the company is simply facing a period of elevated liquidity stress, a developing potential crisis, or whether a crisis already exists. It is this group which will need to quickly gather and digest information regarding the severity and extent of a crisis, and formulate company response accordingly. Different levels of stress clearly call for different levels of response.

Directives to sell assets and/or preserve product balances will come from the liquidity management team. Increasing product sales via any guaranteed issuance facilities may also be appropriate. Senior management, with the authority to approve action on both the investment and product sides of the business, should be involved in this decision-making.

Expected cash inflow projections (asset-related, such as bond coupons and maturities, as well as product-related, such as new sales, renewal premiums and policy loan repayments) should be gathered from experts within the company. These individuals should already be trained in producing such information, and should understand that they may be called upon to do so quickly in the event of an actual crisis. Care should be taken to avoid any double-counting of cash inflows. Projected cash outflows should also be gathered, and again these are both asset-related (funding commitments) and product-related (expected levels of claim and expense payments). Additionally, corporate cash commitments such as scheduled dividend payments and other known corporate expenditures must be projected as well. It is important to capture the timing of these cash inflows and outflows, as this will reveal periods of projected cash shortfalls.

The resulting projected cash balances should be used to identify shortfalls that require the coordinated sale of assets to meet those shortfalls. They can also be the starting point for discussions with product areas to initiate product conservation efforts. Any decision made that can impact asset sales and / or product balances will lead to revisions to projected net cash balances. These projections should be revised as often as needed to ensure timely and accurate decision-making.

In times of liquidity stress, it is important to manage internal and external communications regarding unfolding events. A communication protocol should be in place to ensure consolidated reporting and instructions are clearly communicated to all relevant parties. Care should be taken to ensure that bond traders are given clear instruction regarding the amounts and timing of asset sales. They may also be potentially called upon to "freeze" future assets purchases in order to start warehousing cash. Care should also be taken not to add to liquidity stress by releasing inaccurate information, or by accidentally sending the "wrong" message to external parties (rating agencies, investment banks, regulators, etc.). The liquidity crisis management plan should therefore address several aspects of communication, including recording decisions made by the liquidity crisis management team, sharing those internally with those having a need to know, and the appointing of a single company contact for external audiences.



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Liquidity crisis plans are reviewed periodically or when business or market circumstances change. Incident logs should be kept whenever a small or large crisis has occurred, in order to benefit from past experience. Companies should also regularly assess the effectiveness of their contingency plans. This may include regular contingency tests (“contingency drills”) at a group level, on a regional basis and/or at a subsidiary level, in order to ensure that contingency procedures are known, understood and well designed.



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6. Liquidity Risk in the Context of Required Capital

There is often confusion as to whether required capital should be held for liquidity risk. The CRO Forum believes that liquidity risk is fundamentally, at its core, a risk to be managed – before, during, and after a liquidity stress event – and that it is inappropriate to expect required capital to protect against insolvency arising from this risk. The best line of defence is a strong liquidity policy and management framework where liquidity risk is robustly measured, monitored, and managed.

The existence of “worst-case” liquidity testing, a liquidity policy, and liquidity crisis management plan are crucial to managing liquidity risk. With these elements in place it can be argued effectively that a company is prepared for whatever scenario is contemplated that may drive a capital requirement in the case of other risks. Said differently, the presence of liquidity risk should not lead to an additional capital requirement. A company should independently have a strong liquidity risk management framework in place, and adhere to it.

Principle 8

Requiring capital to provide for liquidity risk is an ineffective means of managing this risk. Liquidity risk is a risk to be managed at all times – before, during, and after any stress event – and no amount of capital can replace comprehensive liquidity risk management.



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Appendix: Sample Reporting

Cash Sources and Cash Needs Detail Sample

Scenario: Current Capital Markets / Customer Panic Withdrawals (300 bp higher rates; downgrade one full letter rating)								
Liquidity Sources (2)	Quarter End Balance (1)	Time Horizon						
		Current	1 Month	3 Month	6 Month	1 Year	18 Month	2 Year
Cash	750	750	750	750	750	750	750	750
Sovereign Backed	1,250	850	950	1,050	1,050	1,050	1,050	1,050
Public IG Bonds	53,000	4,500	7,500	10,500	15,000	30,000	37,000	40,000
Public Non-IG Bonds	5,000	0	250	500	1,250	2,500	3,500	4,000
Private IG Bonds	10,000	50	400	1,000	4,000	6,000	7,000	8,000
Private Non-IG Bonds	1,000	0	0	0	200	400	600	700
Commercial Mortgages	14,000	0	0	750	1,500	3,500	5,500	7,000
Residential Mortgages	50	0	0	0	10	20	30	30
Equities	500	200	500	500	500	500	500	500
Other	3,000	0	0	1,000	1,500	2,000	2,500	2,500
Total Liquidity Sources	88,550	6,350	10,350	16,050	25,760	46,720	58,430	64,530
Liquidity Needs								
Institutional	15,750	750	1,500	2,250	4,800	11,475	13,725	15,300
Pensions	9,000	500	1,400	2,100	3,125	3,900	4,875	5,610
Annuities	31,000	500	1,790	3,600	6,370	13,370	14,700	16,300
Life	17,100	0	325	550	1,380	2,240	3,060	3,700
Health	3,000	0	35	100	170	340	535	670
Property	6,000	120	480	900	1,200	1,500	900	600
Casualty	5,250	105	420	788	1,050	1,313	788	525
Operating expenses	700	0	25	35	50	75	100	125
Total Liquidity Needs	87,800	1,975	5,975	10,323	18,145	34,213	38,683	42,830
Excess Liquidity		4,375	4,375	5,728	7,615	12,508	19,748	21,700
Coverage Ratio		3.2	1.7	1.6	1.4	1.4	1.5	1.5

(1) Market value for assets, reserve balance for liabilities
(2) After reflecting collateral posting requirements

Cash Sources and Cash Needs Summary by Scenario Sample

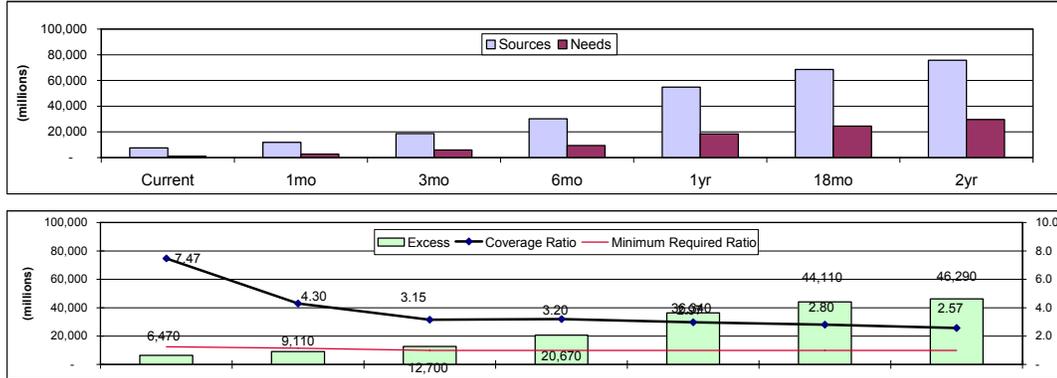
	Cumulative Liquidity	Time Horizon						
		Current	1mo	3mo	6mo	1yr	18mo	2yr
A. Normal Capital Markets / Normal Withdrawals	Sources	7,470	11,870	18,600	30,070	54,790	68,560	75,740
	Needs	1,000	2,760	5,900	9,400	18,450	24,450	29,450
	Excess	6,470	9,110	12,700	20,670	36,340	44,110	46,290
	Coverage Ratio	7.47	4.30	3.15	3.20	2.97	2.80	2.57
	Minimum Required Ratio	1.25	1.15	1.00	1.00	1.00	1.00	1.00
B. Normal Capital Markets / Panic Withdrawals	Sources	6,350	10,350	16,050	25,760	46,720	58,430	64,530
	Needs	1,975	5,975	10,323	18,145	34,213	38,683	42,830
	Excess	4,375	4,375	5,728	7,615	12,508	19,748	21,700
	Coverage Ratio	3.22	1.73	1.55	1.42	1.37	1.51	1.51
	Minimum Required Ratio	1.25	1.15	1.00	1.00	1.00	1.00	1.00
C. Impaired Capital Markets / Panic Withdrawals	Sources	3,750	7,150	13,550	23,900	45,250	58,280	64,380
	Needs	1,975	5,975	10,323	18,145	34,213	38,683	42,830
	Excess	1,775	1,175	3,228	5,755	11,038	19,598	21,550
	Coverage Ratio	1.90	1.20	1.31	1.32	1.32	1.51	1.50
	Minimum Required Ratio	1.25	1.15	1.00	1.00	1.00	1.00	1.00



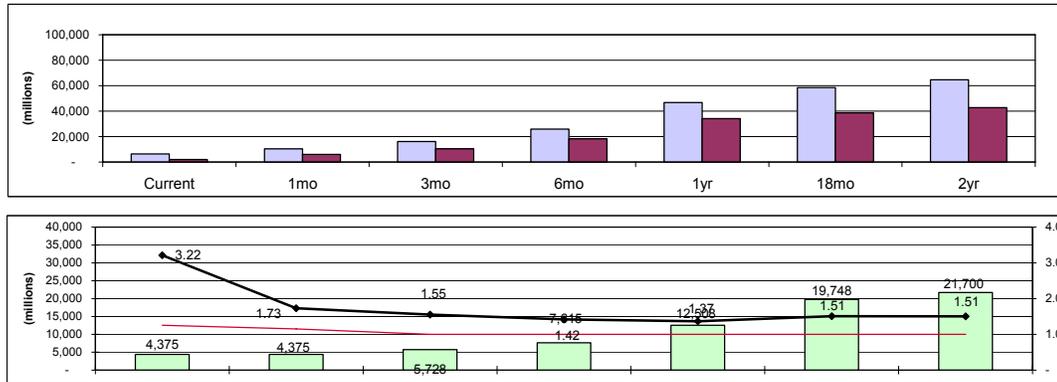
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Cash Sources and Cash Uses Summary by Charting Sample

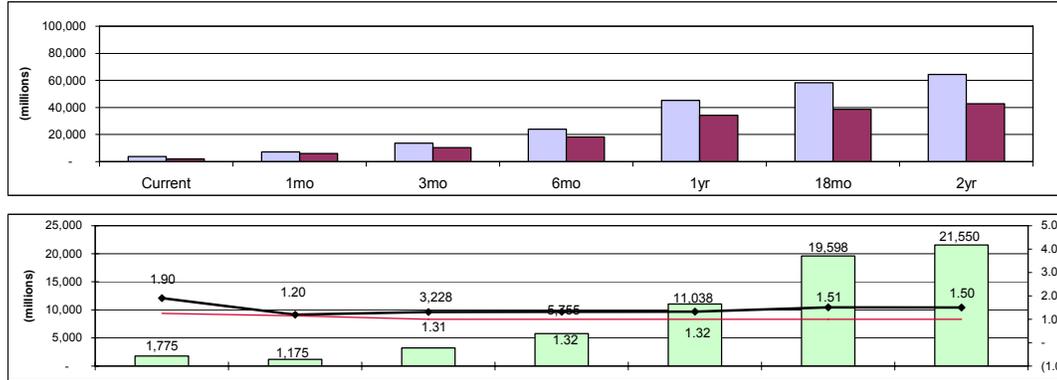
Normal Capital Markets / Normal Withdrawals



Normal Capital Markets / Panic Withdrawals



Impaired Capital Markets / Panic Withdrawals



Two asset scenarios are shown:

- A. Capital markets exhibiting **current** liquidity.
- B. Capital markets exhibiting severely **impaired** liquidity over a prolonged period of time.

Two liability scenarios are shown:

- A. **Normal** - scheduled liability maturities and expected cash demands by policy and contract holders
- B. **Panic** - increased cash demands by policy and contract holders, arising from a 300 bp immediate and permanent spike in rates, along with a full rating downgrade of all claims paying ratings, leading to solvency concerns



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Liquidity Crisis Management Reporting Sample

Projected Number of Weeks before Assets are Sold

Base Case Scenario: Reflects current expectations, considering all known information (1)
 Worst Case Scenario: Reflects substantially more stress on product sales and outflows (2)

n/a
12

Date	Base Case (Expected) Scenario (1)							Worst Case Scenario (2)							Highly Liquid Assets (5)	Contingent Liquidity Sources
	Net Product Cash Needs	Non-Product Cash Needs (3)	Total Cash Needs	Prepays and Interest (4)	Principal Payments	Total Cash Sources	Cumulative Net In (Out)/flow	Net Product Cash Needs	Non-Product Cash Needs (3)	Total Cash Needs	Prepays and Interest (4)	Principal Payments	Total Cash Sources	Cumulative Net In (Out)/flow		
01/01/2009			0			1,000	1,000			0			1,000	1,000	1,750	2,000
08/01/2009	-10	0	-10	185	100	1,285	1,275	-28	0	-28	185	100	1,285	1,257	1,750	2,550
15/01/2009	-35	0	-35	370	200	1,570	1,535	-98	0	-98	370	200	1,570	1,472	1,750	2,975
22/01/2009	-100	0	-100	555	300	1,855	1,755	-279	0	-279	555	300	1,855	1,576	1,750	3,475
29/01/2009	-150	0	-150	740	400	2,140	1,990	-419	0	-419	740	400	2,140	1,721	1,750	3,975
05/02/2009	-250	-500	-750	925	500	2,425	1,675	-698	-500	-1,198	925	500	2,425	1,227	1,750	4,475
12/02/2009	-350	-500	-850	1,110	600	2,710	1,860	-977	-500	-1,477	1,110	600	2,710	1,233	1,750	4,975
19/02/2009	-500	-700	-1,200	1,295	700	2,995	1,795	-1,396	-700	-2,096	1,295	700	2,995	899	1,750	5,475
26/02/2009	-650	-850	-1,500	1,480	800	3,280	1,780	-1,815	-850	-2,665	1,480	800	3,280	615	1,750	6,000
05/03/2009	-780	-850	-1,630	1,665	900	3,565	1,935	-2,178	-850	-3,028	1,665	900	3,565	538	1,750	6,000
12/03/2009	-900	-1,200	-2,100	1,850	1,000	3,850	1,750	-2,513	-1,200	-3,713	1,850	1,000	3,850	138	1,750	6,000
19/03/2009	-1,050	-1,200	-2,250	2,035	1,100	4,135	1,885	-2,931	-1,200	-4,131	2,035	1,100	4,135	4	1,750	6,000
26/03/2009	-1,200	-1,500	-2,700	2,220	1,200	4,420	1,720	-3,350	-1,500	-4,850	2,220	1,200	4,420	-430	1,750	6,000
02/04/2009	-1,330	-1,500	-2,830	2,405	1,300	4,705	1,875	-3,713	-1,500	-5,213	2,405	1,300	4,705	-508	1,750	6,000
09/04/2009	-1,460	-1,500	-2,960	2,590	1,400	4,990	2,030	-4,076	-1,500	-5,576	2,590	1,400	4,990	-586	1,750	6,000
16/04/2009	-1,590	-1,500	-3,090	2,775	1,500	5,275	2,185	-4,439	-1,500	-5,939	2,775	1,500	5,275	-664	1,750	6,000
23/04/2009	-1,720	-1,500	-3,220	2,960	1,600	5,560	2,340	-4,802	-1,500	-6,302	2,960	1,600	5,560	-742	1,750	6,000
30/04/2009	-1,850	-1,500	-3,350	3,145	1,700	5,845	2,495	-5,165	-1,500	-6,665	3,145	1,700	5,845	-820	1,750	6,000
07/05/2009	-1,980	-1,500	-3,480	3,330	1,800	6,130	2,650	-5,528	-1,500	-7,028	3,330	1,800	6,130	-898	1,750	6,000
14/05/2009	-2,110	-1,500	-3,610	3,515	1,900	6,415	2,805	-5,890	-1,500	-7,390	3,515	1,900	6,415	-975	1,750	6,000
21/05/2009	-2,240	-1,500	-3,740	3,700	2,000	6,700	2,960	-6,253	-1,500	-7,753	3,700	2,000	6,700	-1,053	1,750	6,000
28/05/2009	-2,370	-1,500	-3,870	3,885	2,100	6,985	3,115	-6,616	-1,500	-8,116	3,885	2,100	6,985	-1,131	1,750	6,000
04/06/2009	-2,500	-1,500	-4,000	4,070	2,200	7,270	3,270	-6,979	-1,500	-8,479	4,070	2,200	7,270	-1,209	1,750	6,000
11/06/2009	-2,630	-1,500	-4,130	4,255	2,300	7,555	3,425	-7,342	-1,500	-8,842	4,255	2,300	7,555	-1,287	1,750	6,000
18/06/2009	-2,760	-1,500	-4,260	4,440	2,400	7,840	3,580	-7,705	-1,500	-9,205	4,440	2,400	7,840	-1,365	1,750	6,000
25/06/2009	-2,900	-1,500	-4,400	4,600	2,500	8,100	3,700	-8,150	-1,500	-9,650	4,600	2,500	8,100	-1,550	1,750	6,000

Footnotes:

- (1) This scenario contains product net outflows to reflect the current stressed market environment. Figures reflect the net of deposits, premiums, maturities, claims, lapses, policy loans, and commissions/expenses.
- (2) This scenario reflects substantially more stress on product net outflows than the expected scenario. Figures reflect the net of deposits, premiums, maturities, claims, lapses, policy loans, and commissions/expenses.
- (3) Includes operating cash needs, scheduled dividends, etc.
- (4) In addition to coupon and interest payments, includes scheduled principal payments, sinking fund payments, and estimated prepayments.
- (5) Includes Sovereign government bonds and public equities.



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