Background Paper

Market Risk Transfer

Phillippe R. D. Anderson
The World Bank
Fiscal risks that stem from volatility in interest rates, exchange rates, commodity prices, and weather and geologic risks can be mitigated by transferring a portion of those risks to the market. Market risk transfer complements risk reduction measures (such as development of local capital markets, diversified production, and improvements in building codes) and self-insurance, particularly in cases where balance sheet flows are very specifically exposed to market rates and movements, and when high cost, low-probability events present the risk of an economic or financial shock that cannot be absorbed internally.

Successful market risk transfer depends on the existence of commercial actors, generally financial intermediaries, who are better-equipped to manage the exposure to the specific type of volatility in question. These entities, which represent the supply side of the commercial risk market, can include capital market investors, investment banks with interest rate, currency, and commodity trading operations, and insurance and reinsurance companies who have a commercial interest in underwriting natural disaster risk. For these companies, quantifying, accepting, managing, transferring, trading, and diversifying risk is a day-to-day operation, generally supported by a high degree of analysis, sophisticated technical and market analysis, and a substantial level of capital.

By providing information about the cost involved in transferring risks, market actors play an important role in price discovery. The price, or cost, associated with risk transfer depends heavily on the type and frequency of the risk, the level of coverage desired, the time frame of the coverage desired, and available market liquidity (i.e. the number of interested off-takers). Additionally, in the case of interest rate, currency, and commodity risks, the volatility of the underlying market is a critical factor, while in the case of natural disasters, cost is driven by the probability of a specific event happening, and the expected loss associated with the impact of that event. In addition to the price for the “pure risk” component of the coverage, market risk transfer can also involve credit charges, costs associated with ongoing collateral management, and transaction fees to cover administrative and operational costs. As a result, careful analysis of the cost-risk tradeoff associated with these tools is an important part of risk management.

On the demand side of the equation, risk management at a sovereign level has tended to start with a focus on debt management and the need to evaluate and manage refinancing, interest rate, and currency risks. Despite the scale of the most recent global financial crisis, most emerging market countries managed to avoid sovereign debt crises. For many of these, improved macroeconomic management and public debt management over the past decade has contributed
More recently, a number of countries have begun to take a more holistic view about sovereign risk management, now taking into consideration, risks associated with commodity price shocks (impacts on the revenue and on the expenditure sides of the balance sheet), and natural disasters. Countries such as Mexico, Colombia, and Chile are at the forefront of this shift, moving over the past several years toward comprehensive approaches to risk management which balance efforts in risk reduction and market-based risk management. Box 1 below summarizes the experience of Mexico.

**Box 1. Mexico’s Approach to Sovereign Risk Management**

In the *Criterios Generales de Política Económica 2012*, the Government of Mexico underlines the relevance of fiscal risks associated with macroeconomics shocks, crises in the financial sector, and unexpected expenditure outlays related to adverse natural events. Macroeconomic risks stem from lower economic activity, oil price volatility and interest rate and exchange rate movements. Financial sector-related fiscal risks originate from contingent liabilities associated with rescues of financial institutions or financial systems. Population growth and the concentration of physical assets in urban areas are leading to increased exposure to natural disasters. Weather shocks constitute a relevant source of risk for the agriculture sector. Overall, the materialization of fiscal risks generated by unexpected spending pressures or revenue losses may trigger disruptive and costly ad hoc adjustments during annual budget implementation.

Included in the Government’s integrated risk management approach are efforts such as:

- Using market-based risk management instruments to mitigate vulnerability to interest rate risk and currency risk for national and subnational loans.
- Publicizing the national strategy for hedging oil prices in order to protect the budget from volatility associated with export revenues.
- Supporting the agriculture sector by strengthening efforts to reduce the vulnerability of producers and rural communities using agricultural insurance and commodity hedging tools.
- Developing an integrated financing and insurance strategy for managing disaster-related risks and extending this strategy to the state level. One component of this strategy involves transferring the risk of natural disasters to the capital markets through the use of catastrophe bonds.

For all of these activities, risk identification is an important starting point. Government’s emphasis on institutionalizing risk assessment and risk mitigation into public programs has helped to strengthen the culture of risk management in the country.

Broadly speaking, products used for market risk transfer tend to be financial instruments which fall into one of three broad classes: i) derivatives, ii) insurance instruments, and iii) capital...

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market instruments such as insurance-linked securities and bonds. A brief description of each follows.

- **Derivatives** are financial instruments with a value derived from one or more underlying assets, securities, price, or index. Derivatives differ according to type of the underlying value (equity, interest rate, exchange rate, commodity, or credit), the structure of the relationship between the derivative contract itself and the underlying value (forward, swap, option), the market in which they are offered (exchanges where trade is supervised by a formal clearing house, or “over-the-counter” contracts which trade bilaterally between counterparties), and the pay-off function.

- **Insurance instruments** are financial instruments that represent a transfer of the risk of a loss from one entity to the other, in exchange for a payment. Insurance contracts are policies which explain the specific circumstances under which the financial compensation will take place, and the conditions of the coverage. Insurance companies are willing to absorb the risk of individual exposures when they are able to pool the risk of many exposures (over a large number of policies, perils, and geographies) thereby maximizing revenue from premiums while minimizing the risk of payouts. Reinsurance companies perform a similar function by insuring the pooled risk of individual insurance companies, or other established risk pools.

- **Capital market instruments** are financial instruments that represent the interest of an investor willing to make an investment in an asset that presents an acceptable risk-return trade-off. As an example, insurance-linked securities such as catastrophe bonds present an investor with the opportunity to earn a specific rate of return in exchange for accepting the risk of losing the investment in the event of a pre-defined event (such as a catastrophic earthquake or hurricane).

[Table 1 presents an overview of selected market risk transfer instruments and applications]

From a process point of view, market risk transfer operations draw on a set of fundamentals common across a wide set of risks. In all cases, sound risk management includes careful risk assessment, ongoing monitoring of exposures and impacts, simulating impacts of alternative scenarios, and establishing the institutional and operational frameworks necessary to support financial transactions. Government entities that are often central to these operations include the Ministry of Finance, public debt management offices, national treasuries, and state-owned entities. Central banks, sovereign wealth funds, and pension funds also establish and operate within carefully defined risk management frameworks, and can serve as a source of expertise on the use of market-based tools.
Over the past several years, a number of global investment banks have been increasing their attention to sovereign clients in emerging markets, resulting in a scaling up of efforts to market specific risk transfer solutions to governments. In many cases, an uneven playing field exists with respect to government’s ability to participate in such discussions and negotiations. Additionally, legal or regulatory changes may be required to permit governments to use certain financial instruments and access markets, and those changes can take time. From an institutional point of view, governments often lack the necessary frameworks to support risk management programs, particularly since financial instruments often require technical expertise that may not be available in-house. Finally, governments may not have funds to invest upfront in risk management solutions (such as insurance or hedging transactions). In cases where funds are available, costs may be high, and political leaders may feel vulnerable to criticism that they have neglected more immediate needs and spent scarce resources to provide protection against an event that may not happen. Such decisions are vulnerable to ex-post criticism and political risk.

A sound risk management framework implemented at a government balance sheet level can help overcome some of these constraints and concerns. Formally clarifying the objectives of the risk management strategy is important, as is achieving consensus about how much to invest. Governance over the selection of instruments is critical, as is careful management of commercial counterparty relationships and risks. Establishing institutional and operational frameworks that incorporate prudent controls helps to institutionalize risk management practices, but also protect individual decision-makers and operators. Finally, taking a broad look at exposure using an asset-liability management framework provides an opportunity to identify internal offsets, and pooling risk to include a wider number of countries can help reduce the cost.
Table 1 – Overview of Select Market Risk Transfer Instruments

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<th>Risk</th>
<th>Instrument</th>
<th>Description</th>
<th>Advantages / Benefits</th>
<th>Disadvantages / Costs</th>
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| Interest Rate | Swap       | - An agreement between two parties to exchange the cash flows, based on a notional amount, associated with movements over time between fixed and floating interest rates, or from one floating rate to another. | - No upfront costs.  
- Provides a high degree of flexibility which can be used to mirror, and therefore manage, specific exposures, for example, within a debt portfolio. | - Creates an unknown and unpredictable future liability since hedger will owe the market counterparty if the market moves in an adverse direction. |
|             | Cap/Floor  | - A contract which provides protection against the risk of interest rates moving above or below a pre-agreed level | - Provides ability to lock in a maximum or minimum rate, and to take advantage of positive rate movements that may occur in the future. | - Has an upfront cost or premium. |
| Currency    | Swap       | - An agreement between two parties to exchange the cash flows, based on a notional amount, associated with movements over time between currency rates. | - No upfront costs.  
- Provides a high degree of flexibility which can be used to mirror, and therefore manage, specific exposures, for example, within a debt portfolio. | - Creates an unknown and unpredictable future liability since hedger will owe the market counterparty if the market moves in an adverse direction. |
| Commodity   | Future     | - A contract to buy a specific quantity of an exchange-traded commodity, at a specific price, on a specific date in the future. | - No upfront costs.  
- Provides ability to “lock in” forward prices through a financial contract. | - Since prices are “locked in” the prevents the ability to take advantage of lower prices if they occur in the future.  
- Creates an unknown and unpredictable future liability since hedger will owe the market counterparty if the market moves in an adverse direction.  
- Requires financing of a credit line or credit guarantee, and ability to manage margin calls. |
<p>|             | Options    | - A contract that provides the buyer with the right, but not the obligation to buy or sell a specific quantity of a commodity, at a specific price, on | - Provides ability to lock in maximum price (ceiling / cap) and to take advantage of positive price movements that may occur in the | - Has an upfront cost or premium, which is market-driven and volatile but can range from 5-12% of the value of the underlying price for a |</p>
<table>
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<th>Natural Disaster</th>
<th>Derivatives / Swaps</th>
<th>Insurance/ reinsurance</th>
<th>Insurance-linked securities</th>
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<td><strong>a specific date in the future.</strong></td>
<td>- A contract based on an underlying index derived from information about measurable weather events, such as rainfall, temperature, tropical storms, hurricanes, cyclones, and typhoons, and earthquakes - An entity seeking coverage cover against its exposure exchanges a fixed periodic payment, or a premium, for compensation related to the risk.</td>
<td>- A contract that represents the shifting of part or all of the risk of an event from one party to another, in exchange for payment of a premium.</td>
<td>- A contract that represents the shifting of risk to an investor willing to accept a specific risk-return.</td>
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<td><strong>future.</strong></td>
<td>- Specific trigger levels and a payout structure are designed to reflect the financial impact of the negative event. - Objective, measurable, and independently verifiable.</td>
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<td><strong>6-18 month coverage, depending on market conditions.</strong></td>
<td>- Has an upfront cost, or premium, which is based on the historical probability and estimated impact of the risk event.</td>
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<td>- Can be complex and time-consuming to structure.</td>
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