

ARM – 56

Risk Financing

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Chapter 9

Transferring Financial Risk

Transferring Financial Risk

Educational Objectives

After learning the content of this assignment, you should be able to:

- ▶ Describe the various types of financial risk.
- ▶ Explain how an organization can use derivatives such as forwards, futures, options, and swaps to transfer financial risk.
- ▶ Explain how an organization can use securitization to transfer financial risk.
- ▶ Given information on an organization's financial risk, recommend ways to transfer the risk.

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Types of Financial Risk

- ▶ A financial instrument is a check, bond, a share of stock, or other document with monetary value
 - Can also be a binding agreement between parties for payment of money
- ▶ Financial risk refers to the uncertainty arising from the effect of market forces on a financial asset or liability.
- ▶ Three key categories of financial risk are
 - Market risk
 - Credit Risk
 - Price Risk

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Types of Financial Risk

- ▶ Market Risk – Uncertainty about an investment's future value because of potential changes in the market for that type of investment
 - Interest Rate Risk –
 - security's future value will decline due to changes in interest rate
 - Exchange Rate Risk –
 - Uncertainty due to potential changes in exchange rate between currencies
 - Liquidity Risk –
 - Risk that an asset cannot be sold on short notice without incurring a loss

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Types of Financial Risk

- ▶ Credit Risk – Risk that customers or creditors will fail to make promised payments as they come due
 - Mortgage crisis
- ▶ Price Risk – Potential for a change in revenue or cost because of an increase or decrease in the price of a product or an input
 - Oil prices
 - Airline price wars

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Derivatives

▶ Definition

- Financial contract that derives its value from another asset, such as a commodity, or that can derive its value from the yields on another asset (S&P 500)
 - Forward and Futures Contracts are two of four major categories of derivatives used in financial risk management

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Derivatives

▶ Forward Contracts (Futures)

- A contract that obligates one party to buy and another party to sell a specific financial instrument or physical commodity at a specified future date and price
- Simplest form of derivative

▶ Futures Contract is a forward contract that is exchange traded, openly available, and transferable.

- Used to reduce the risk of price fluctuations
 - Examples include Southwest Airlines purchase of Jet Fuel

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Derivatives

▶ Option

- An agreement that gives its holder the right, but not the obligation, to buy or sell an asset at a specific price over a period of time
 - Call option – buy at a set amount
 - Put option – sell at a set amount
 - Example of stock options

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Derivatives

▶ Swap

- An agreement between two organizations to exchange payments based on changes in the value of an asset, yield, or index over a specific period
 - Structured so no money is paid up front
 - Cash flows exchanged back and forth during contract period
 - Commonly used to manage interest rate and currency rate of exchange risk

Schedule of Payments in an Interest Rate Swap

Date	LIBOR	Floating Payment	Fixed Payment	Net Cash Flow for ABC Co.
1st Quarter	1.50%	\$75,000	\$100,000	-\$25,000
2nd Quarter	1.75%	\$87,500	\$100,000	-\$12,500
3rd Quarter	2.75%	\$137,500	\$100,000	\$37,500
4th Quarter	3.25%	\$162,500	\$100,000	\$62,500

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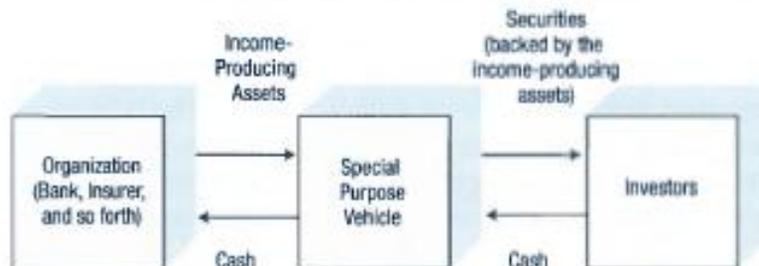
Securitization

- ▶ Securitization
 - The process of creating a marketable investment security based upon the expected cash flows from a financial transaction
 - Exchanges incoming producing assets for cash
 - Benefit to investors by “gambling” on a defined insurable risk event(s), not overall risk of an organization
 - Rating agencies are more involved now
 - Can be used to exchange income-producing assets for cash provided by the purchaser of the security, assuming that a market exists
- ▶ Special Purpose Vehicle
 - A facility established for the purpose of purchasing income producing assets from an organization holding title to them and then using those assets to collateralize securities that will be sold to investors.
 - Enables a bank to convert mortgage receivables asset into cash

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Securitization

Generic Securitization Model



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Chapter 10

Transferring Hazard Risk to Capital Markets

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Transferring Hazard Risk to the Capital Markets

Educational Objectives

After learning the content of this assignment, you should be able to:

- ▶ Describe the types of capital market products used for risk financing.
- ▶ Explain how insurance-linked securities operate in terms of the following:
 - The use of catastrophe bonds
 - The benefits to investors
 - The advantages and disadvantages
- ▶ Explain how insurance derivatives operate, including:
 - The use of swaps
 - The use of insurance options
 - The advantages and disadvantages of insurance derivatives
- ▶ Explain how these contingent capital arrangements operate:
 - The use of a standby credit facility
 - The use of a contingent surplus note arrangement
 - The use of a catastrophe equity put arrangement
 - The advantages and disadvantages of contingent capital arrangements
- ▶ Analyze the concerns of organizations that use insurance-linked securities and insurance derivatives to transfer risk and the investors supplying capital.
- ▶ Describe the regulatory and accounting issues involved with insurance-linked securities and insurance derivatives.

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Types of Capital Market Products

- ▶ Capital market products are traded financial instruments (such as stocks and bonds) that mature in more than one year
 - Used to finance risk as an alternative to insurance
 - Typically once used only to provide capital to insurers to underwrite their customers' risk
- ▶ Typically includes
 - Insurance linked securities
 - Insurance derivatives
 - Contingent capital arrangements

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Insurance Linked Securities

- ▶ Insurance-linked security is a financial instrument whose value is driven by insurance and/or reinsurance loss events
 - Marketable instrument based on the cash flows that arise from the transfer of insurable risk
 - Cash flows similar to premium and loss payments under an insurance policy
 - Mainly in the form of catastrophe bonds

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Insurance Linked Securities

- ▶ Catastrophe Bonds
 - A type of insurance linked security that is specifically designed to transfer insurable catastrophic risk to investors.
 - Used by large reinsurers or corporations and mimic traditional catastrophic insurance
- ▶ Intended for rare/infrequent events
 - This is more like Las Vegas betting whether a rare catastrophic event will occur, such as a 100 year flood, Cat. 4 hurricane, etc..

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Example of Insurance-Linked Security

A property insurer has hurricane concentration risk in the southeastern and Gulf Coast regions of the United States. The property insurer is financially strong. A Category Three or higher hurricane that affects a densely populated area in the insurer's coverage region (Dade County, for example) could result in over \$1.5 billion in paid insured losses for the firm. The insurer, therefore, wants to use a risk transfer mechanism that will reduce the variability of its financial results from one year to the next due to catastrophic events. It determines that traditional catastrophic reinsurance is not the most economically viable option for doing so, because previous hurricane events reduced reinsurer capacity and increased the year-to-year volatility of the cost of reinsurance.

The property insurer uses an SPV to issue \$500 million in three-year catastrophe bonds to, in effect, reinsure its Gulf Coast and southeastern hurricane risks. The bond investors lose interest or interest and principal, depending on the bond series, if a Category Three, Four, or Five hurricane causes insured losses to the property insurer in excess of \$1 billion during a twelve-month claims period. The property insurer, in turn, receives reimbursement for any catastrophe losses from the SPV. The bond offering is fully subscribed by investors.

The investors purchase the bonds from the SPV because they provide a premium rate of interest (that is, it is higher than that provided by a United States Treasury bond of comparable maturity) based on the expected frequency and severity of the embedded hurricane risk. In exchange for receiving a premium interest rate, the investors' return on the bond is linked to the risk of a Category Three or higher hurricane striking during the term of the bond. The bond investors underwrite the hurricane risk, which is an insurable risk because it could also have been underwritten with a traditional reinsurance policy. Therefore, the bond is an insurance-linked security. It is marketable because a secondary financial market exists, which is a market in which a bond can be sold to a subsequent investor during the bond's term. Therefore, through the process of insurance securitization, the property insurer's risk of a sizable loss due to a major hurricane has been "securitized" by linking it with the returns provided to investors in a marketable security. The securitization solution enables the property insurer to more effectively deploy its capital resources.

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Insurance Linked Securities

▶ Advantages

- Create additional Risk Transfer Capacity
- Lower credit risk – obligations fully collateralized

▶ Disadvantages

- Exposure to volatility of Market's Demand
- Opportunity Cost of Collateralized Assets
- Transaction costs
- Basis Risk – amount organization receives to offset losses may be greater/less than actual losses

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Insurance Derivatives

▶ Insurance Derivative is a financial contract whose value is based on the level of insurable losses that occur during a specific period of time.

- Increases in value as specified insurable losses increase
- Financial contracts based on insurance derivative concept include
 - Swaps
 - Insurance options

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Swap Examples—World Bank and Caribbean Catastrophe Risk Insurance Facility (CCRIF) Swap and Related Swap

In June 2006, as part of a regional catastrophe risk insurance pool to protect the Caribbean states against natural disasters (such as hurricanes, earthquakes, floods, and tsunamis), the Caribbean Catastrophe Risk Insurance Facility (CCRIF) established a risk management arrangement that resulted in two catastrophe swaps. The \$110 million pool arrangement provides the CCRIF with capacity to serve its claims based on its own reserves and on capacity gained from the international market. The CCRIF arrangement for catastrophe losses consists of four layers. The first layer includes retention of the first \$10 million of claims, the second layer is reinsurance of \$15 million, the third layer is reinsurance of \$24 million, and the fourth layer includes reinsurance of \$50 million and a \$20 million catastrophe insurance swap between CCRIF and the World Bank through the International Bank for Reconstruction and Development (IBRD). In conjunction with the CCRIF swap, the IBRD established a catastrophe swap with Munich Re Capital Markets to shield its reserves from the catastrophe risk. CCRIF touts its \$20 million swap with IBRD as “the first transaction to enable emerging countries to use a derivative transaction to access the capital market to insure against natural disasters.”* Participating countries in the CCRIF pool will have immediate access to cash, based on the severity of the catastrophe and its estimated impact on each government’s funds.**

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Example of an Insurance Option

Weather options derive their value from a measurement of weather conditions, such as average temperature or cumulative precipitation over a finite period. An organization can purchase these options to transfer weather-related risk.

For example, a midwestern U.S. basement repair contractor is most profitable during unusually wet summers—when cracks in basements are most likely to leak. Therefore, the worst-case weather situation for the basement contractor is a prolonged summer drought. The contractor determines that for every inch of precipitation shortfall below average for the months of August and September, the firm loses \$10,000 in net income.

The basement repair contractor purchases a weather put option based on the measurement of rainfall during this period at the nearest weather station. The average precipitation for August through September is seven inches. The insurance option’s put strike price is set at five inches. The put option is designed so that for every inch of precipitation below strike value (five inches), the option increases in value by \$10,000. The precipitation cover is written as an insurance policy and has a limit of \$40,000. If the cumulative precipitation between August and September is only three and one-half inches, the contractor will receive a payout of \$15,000 $[(5-3.5) \times 10,000]$ from the weather insurer to help offset any lost profit from a reduction in the demand for basement repairs.

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Insurance Policies Compared With Option Contracts

Insurance Policy	Option Contracts— General and Insurance
Premium is paid by the purchaser prior to policy inception.	Premium is paid by the purchaser at the beginning of the contract term.
Deductible of self-insured retention can apply to a single occurrence or to aggregate losses for the policy period.	Strike price can apply to a single event, at regular time periods, or to the average or total experience over the entire contract period.
Purchaser is indemnified by the insurer if the level of insured losses exceeds the deductible or self-insured retention.	An option has value only if the underlying asset or index exceeds the strike price. Only then will the purchaser exercise the option for financial gain.
Has a policy limit.	Theoretically, has no limit of payout.

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Insurance Derivatives

- ▶ Advantages
 - Additional risk capacity
 - Lower in cost than insurance-linked securities
 - Transparent pricing
 - Opportunities for investors to exit during its term
 - Standardized contracts
 - Efficient claims and contract settlement
- ▶ Disadvantages
 - Underdeveloped markets
 - Basis risk
 - Credit risk
 - Uncertain regulatory and accounting treatment

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Contingent Capital Arrangement

- ▶ An agreement entered before losses occur, that enables an organization to raise cash by selling stock or issuing debt at prearranged terms after a loss occurs that exceeds a certain threshold
 - **Standby Credit Facility**
 - Arrangement in which bank or other financial institution agrees to provide a loan in the event of a loss
 - **Contingent Surplus Note**
 - Notes that can be sold, if needed, to obtain cash at pre-agreed rate of interest
 - **Catastrophe equity put option**
 - Ability to sell stock at pre-determined price

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Standby Credit Facility Compared With Excess Insurance

	Standby Credit Facility	Excess Insurance
Amount of funds available for losses	\$10 million	\$10 million
Initial cost of making funds available per year—prior to loss payments	\$5,000 commitment fee	\$200,000 premium
Interest rate on loan—if needed	5%	N/A
Length of loan—if needed	15 years	N/A
Largest possible cost in first year	\$700,000 (Repay the loan = \$10 million divided by 15 plus 5 percent interest)	\$200,000 (premium payment)

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Contingent Capital Arrangement

▶ Advantages

- Lower initial cost of making funds available to an organization per year
- Capital infusion at pre-determined price

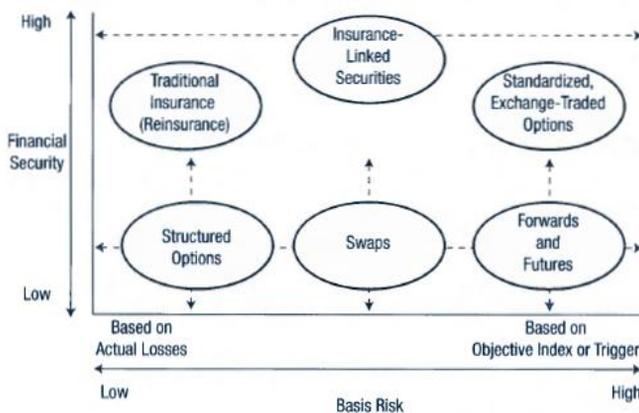
▶ Disadvantages

- Loss sensitivity
- Ownership dilution

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Concerns of Capital for Transferring Hazard risk

Insurance (Reinsurance), Insurance-Linked Securities, and Insurance Derivatives: Financial Security and Basis Risk



▶ Organizations Transferring Risk

- Cost
- Financial security (credit risk)
- Basis risk

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Capital Market Regulatory and Accounting Issues

- ▶ Main issue is whether insurance-linked securities and derivatives should be regulated like insurance
 - If treated like insurance
 - State insurance regulations and premium taxes
 - Accounting for liabilities
 - If treated not insurance
 - Complying with SEC regulations
 - May not be tax deductible
 - Must record losses on balance sheet