



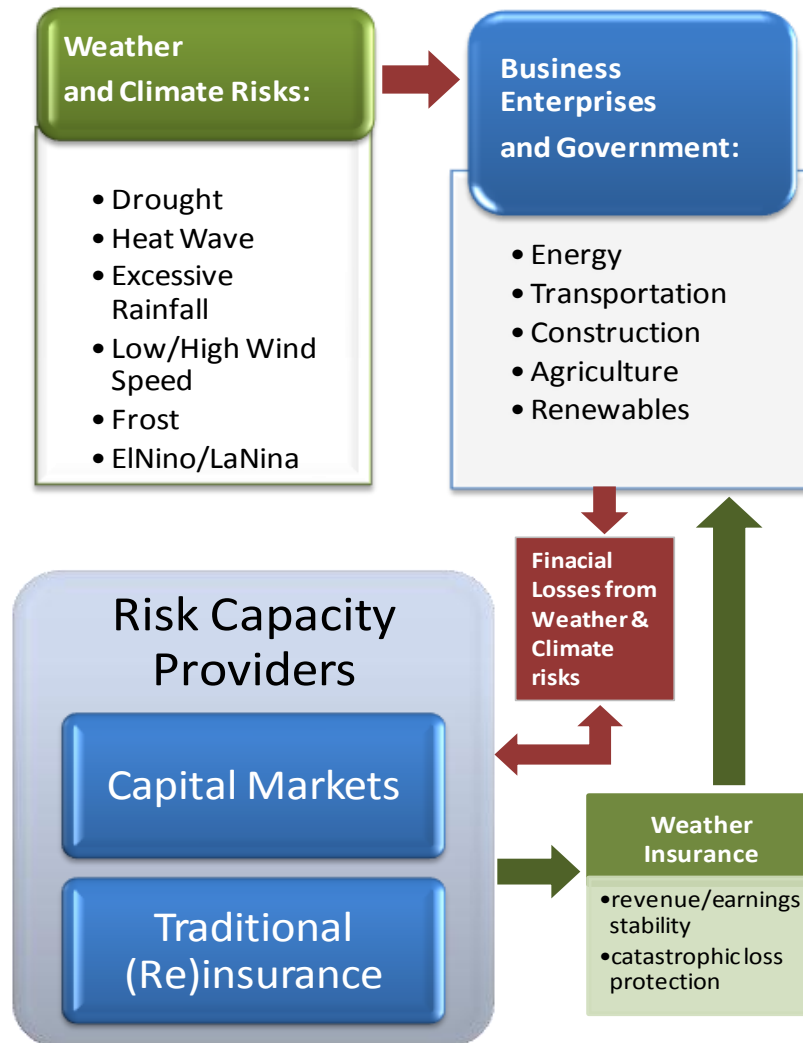
The Role of Hedge Funds in Providing Reinsurance Capacity for Weather Risk

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- ✓ Weather & climate risks have historically been held rather than hedged
 - ✓ Many businesses are unaware of existing risk transfer solutions
 - ✓ Some who tried weather insurance in the past have wrong perception about the depth of market capability and pricing
- ✓ Today's weather risk transfer market is robust:
 - ✓ Depth: variety of risk capacity providers, including capital market investors such as hedge funds & pension funds
 - ✓ Location: availability of weather data allows for global coverage
 - ✓ Products: variety of hedging products are available & customization is possible
 - ✓ Pricing: competitive due to large number of investors



Exchange Traded- CME



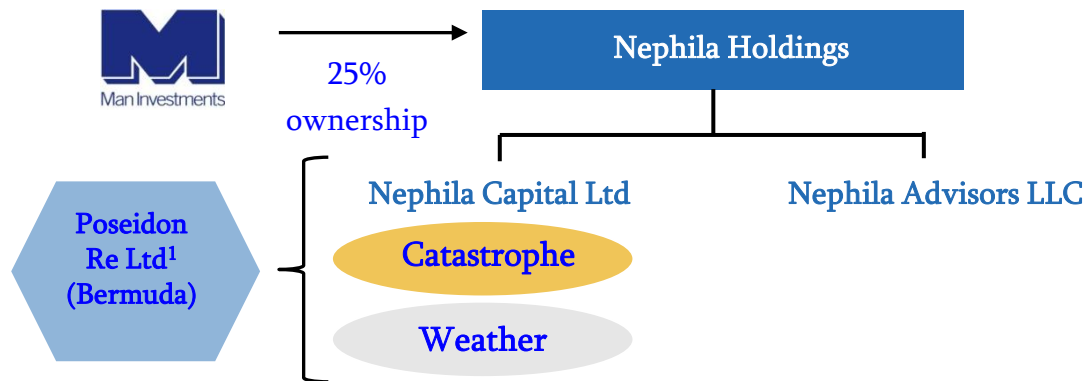
- ✓ limited number of specific weather indices
 - ✓ standard terms
 - ✓ available only for a limited number of cities
 - ✓ allows speculators and sophisticated hedgers to trade with each other
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Insurance, Reinsurance and OTC markets

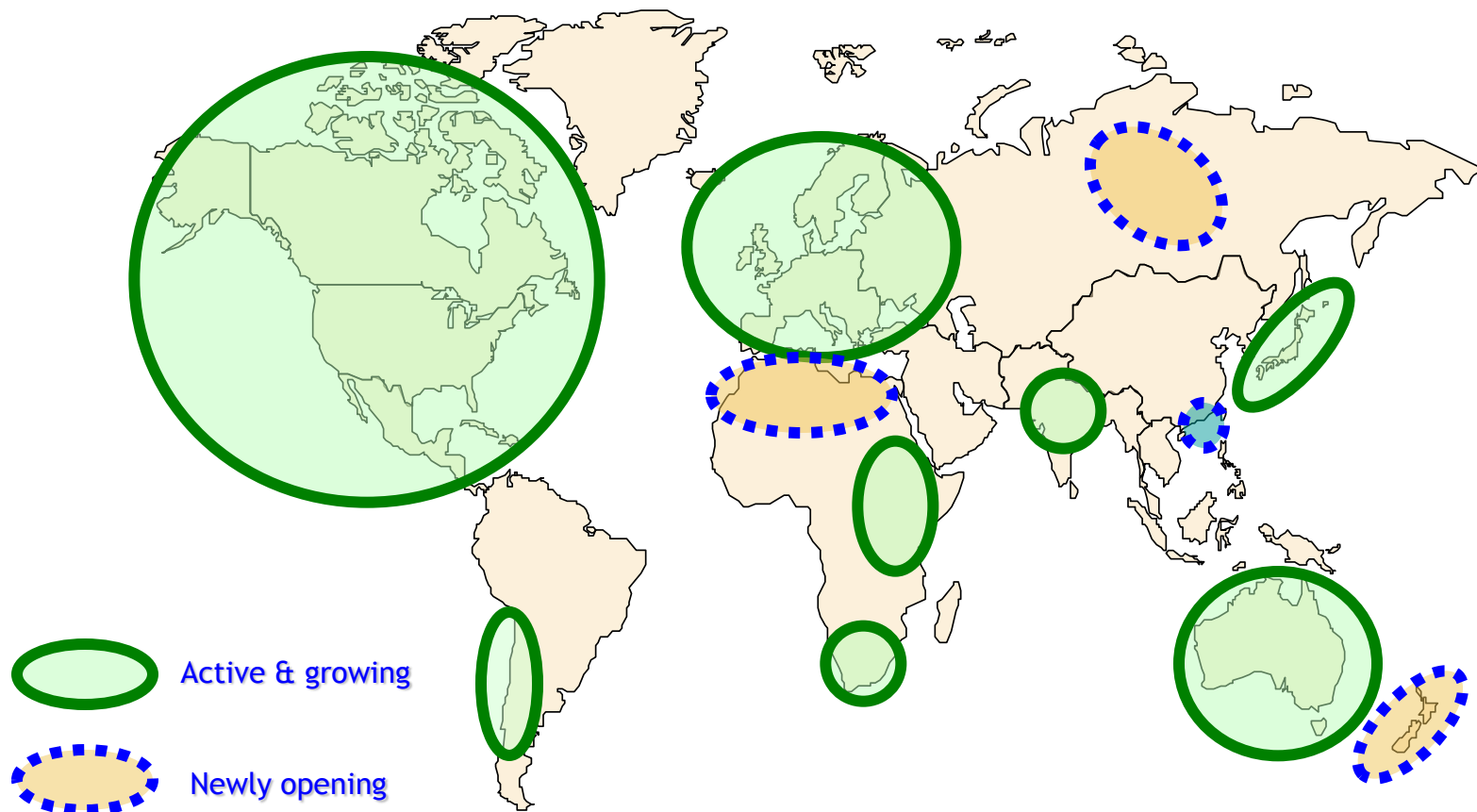


- ✓ hedgers can access risk capacity from an array of large investors / financial services
- ✓ key driver of market growth
- ✓ any weather variable
- ✓ Products can be customized
- ✓ transacted as insurance or derivatives

- ✓ First investment manager dedicated to natural hazard risk (catastrophe and weather) sector
 - ✓ total AUM of ~\$4.6 bn as of September 2011 across multiple vehicles
 - ✓ invests for large number of pensions funds and others
- ✓ Platform offers risk transfer solutions to companies exposed to cat and weather risks
 - ✓ protection can be structured in re/insurance and derivative form
 - ✓ strategic partnerships allow local solutions globally
- ✓ Based in Bermuda but recently opened a new office in San Francisco
 - ✓ 25% owned by Man Group (EMG.L), largest public alternative asset manager



World Weather Risk Transfer Markets Today



Industry	Weather Variable	Weather Exposure
Energy	Precipitation, Temperature, Wind, Solar irradiance	Reduced or excessive demand Reduced or excessive supply
Agriculture	Precipitation, Temperature	Crop yield, handling, storage, pests
On Shore Construction	Wind, Temperature	Budget overruns, Schedule disruption
Sports & Entertainment	Precipitation	Cancellations, Schedule disruption
Retailing	Precipitation, Temperature	Reduced product demand
Transportation	Precipitation, Temperature	Budget overruns, delays
Travel	Precipitation, Temperature	Cancellations, Schedule disruption
Governments	Precipitation, Temperature	Budget overruns
Off-shore Construction	Wave, Wind	Budget overruns, Schedule disruption

Defining Weather Risk



Location

Single weather station
Location basket
(weighted or uniform)



Period

Annual
Seasonal
Event covers
Multi-year



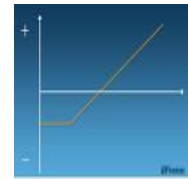
Variable

Temperature
Precipitation
(rainfall, snowfall)
River flow
Wind-speed
Sunshine/Irradiance
Combinations
(humidity, frost)



Trigger

Deviation from average
Critical days index
Rank



Payout

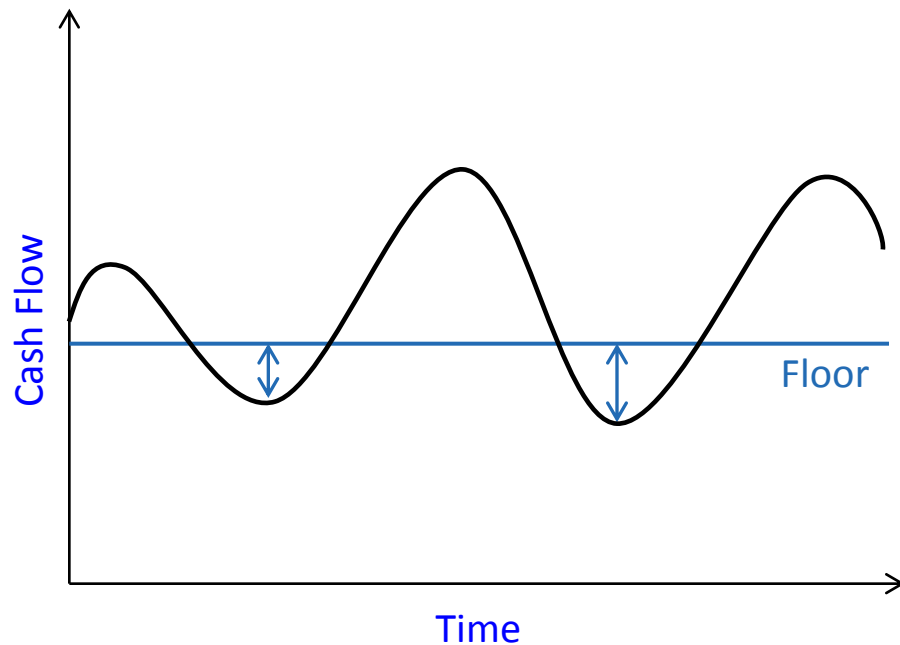
Binary above trigger
Equally weighted layer
Secondary price variable
(power, natural gas, carbon)

Payout Structures: Options

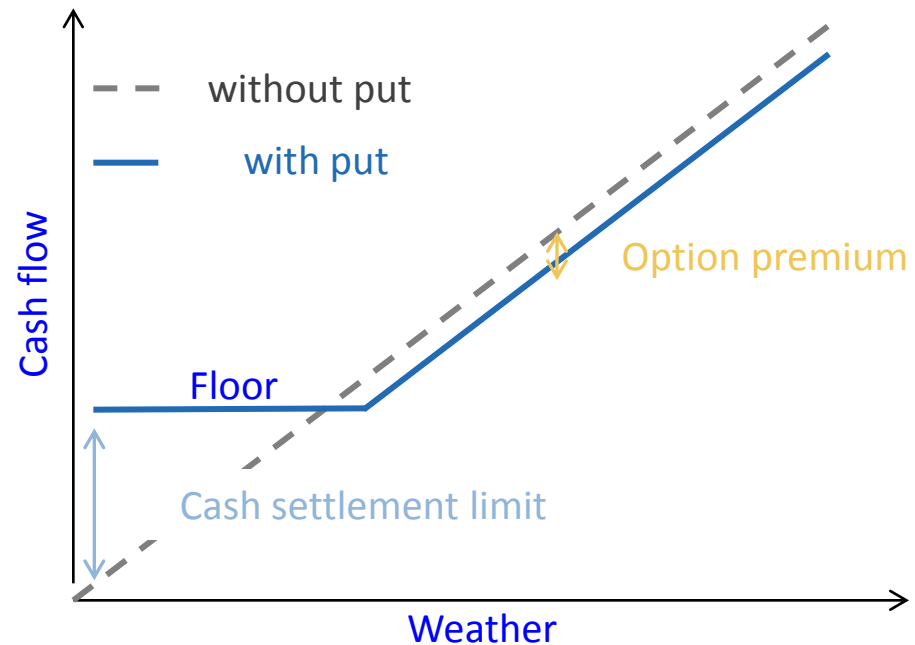
Protect against extreme outcomes



- Structure
 - Recoup losses in excess of a retention



- Benefits and Costs
 - Limited downside risk
 - Upfront costs (option premium)



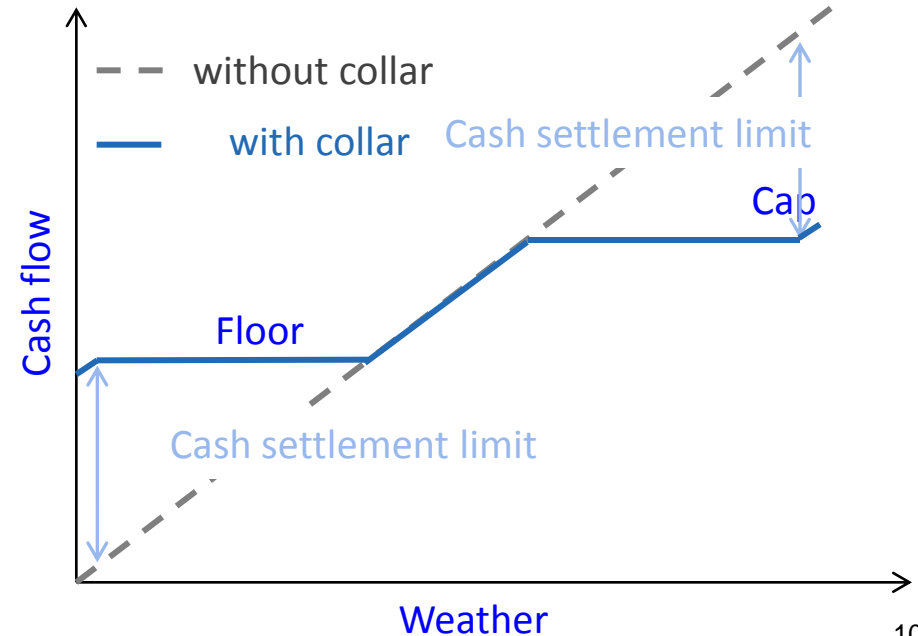
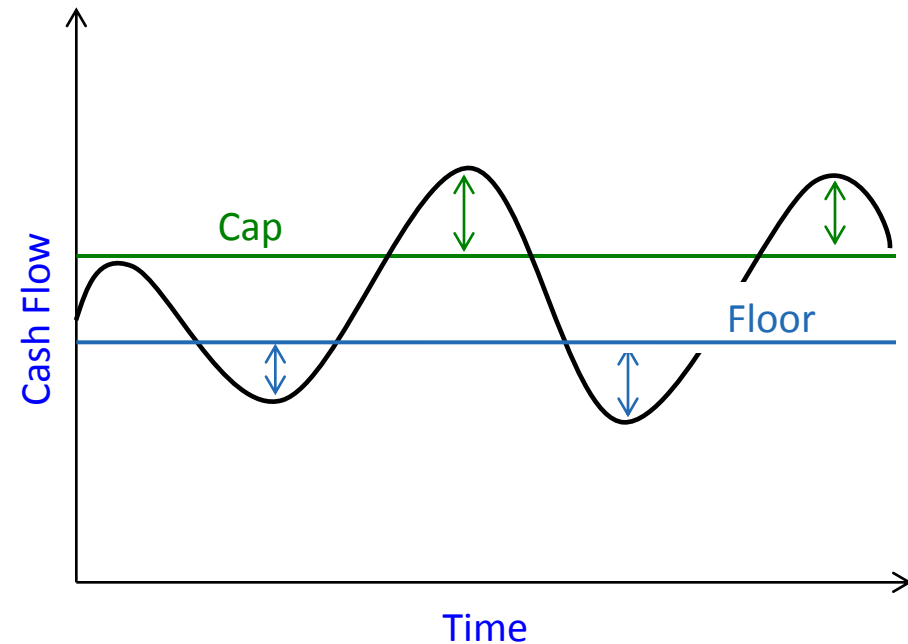
Payout Structures :Collar

Reduce volatility



- Structure
 - Exchange upside for downside protection outside of a retained band

- Benefits and Costs
 - Limited downside risk
 - No or low upfront cost (premium)
 - Loss of upside



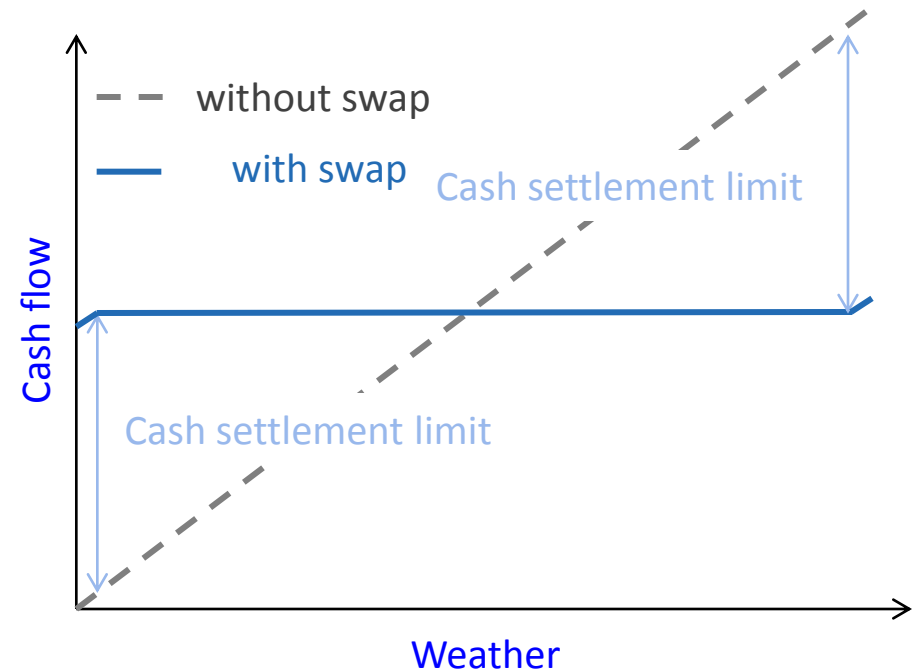
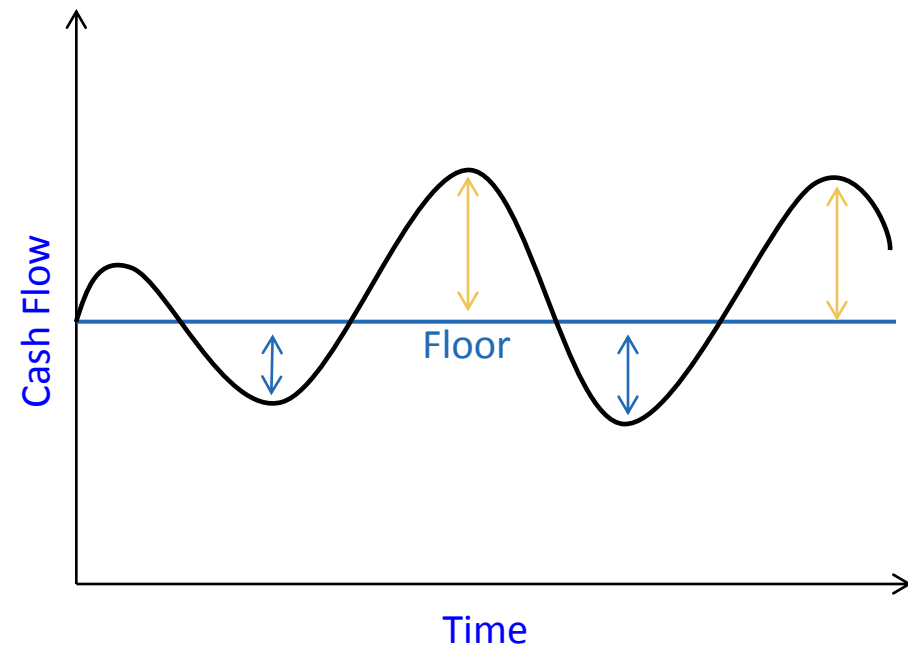
Payout Structures : Swap

Remove volatility



- Structure
 - Exchange upside for downside protection

- Benefits and Costs
 - Certainty in cash flows
 - No upfront costs (premium)



- ✓ Pricing of weather hedges is data driven, therefore it is transparent
- ✓ The key drivers of prices (premium) are:
 - ✓ Average payout expectation
 - ✓ Maximum contract payout
 - ✓ Probability of attachment
 - ✓ Model uncertainty
- ✓ Pricing can be competitive if risk is attractive to multiple capacity providers i.e.:
 - ✓ Historical weather data is available (long history and clean)
 - ✓ Weather index is simple to analyze
 - ✓ Risks that are not exclusively related to weather are excluded

- ✓ Businesses and governments do not have to retain weather & climate risks
 - ✓ A variety of affordable risk transfer solutions are available
 - ✓ The capital market plays a large role in providing risk capacity, hence pricing efficiency
 - ✓ Products are available globally, provided underlying weather data can be sourced
 - ✓ Customization is possible to tailor hedge products for large buyers

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