Linking PRI Pricing and Portfolio Management with Economic Capital Modeling

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PRI Pricing

- Has traditionally been more of a qualitative process than quantitative
- Low historical data availability
  - Low frequency / high severity events
  - Countries with the highest risk often have the least available data
- Illiquid and non-uniform markets
  - Products differ among providers
- Complicated risks
  - Modeling outside of traditional economic and actuarial approaches
  - Risk driven by country policies and economics
- “Art”, rather than “science”
  - Pricing primarily based on underwriters’ expert judgment and experience

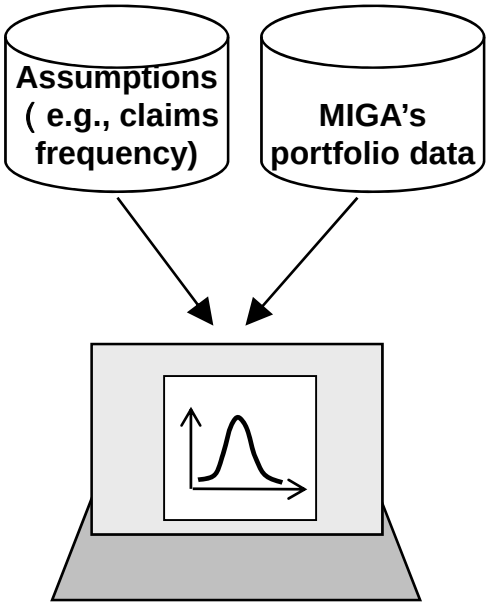
Today, both private and public providers have started incorporating analytical approaches in their pricing decisions and risk management

Agenda

- MIGA's Economic Capital-Based Risk Management Framework
- Use of Economic Capital for PRI Pricing, in MIGA's Context

1. Overview of MIGA's EC-Based Risk Management Framework

MIGA has completed stages of modeling work to incorporate quantitative aspects into key decisions such as pricing

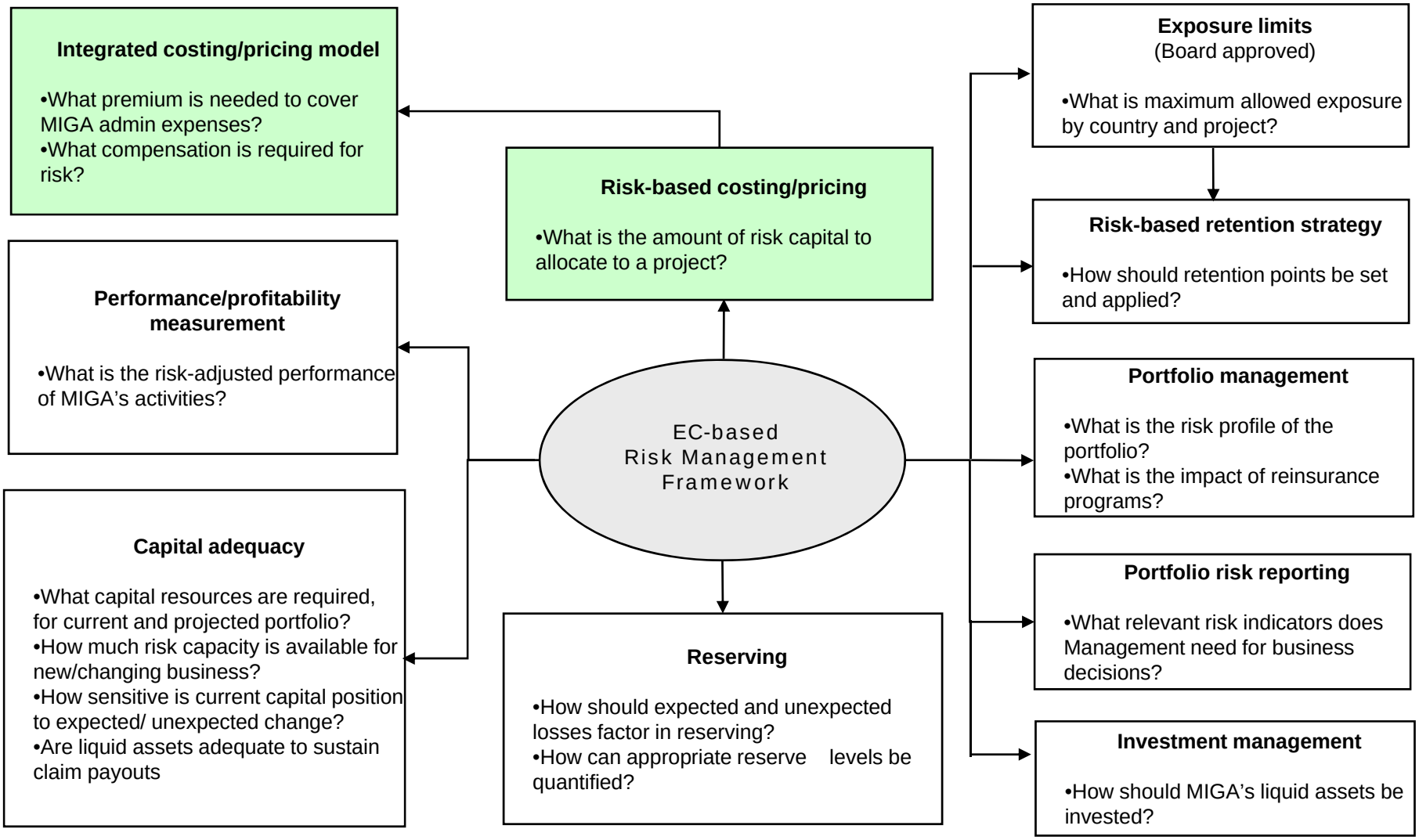


Portfolio Risk Model

- Complete loss distribution calculated for portfolio
- Allocation to project, cover, country, region
- Measures marginal effects of portfolio changes → pricing of new projects
- Integration of reinsurance credit risk
- Most recent step was done last year, to allocate EC consumed rather than actual capital for pricing

➡ Now: Common risk assumptions with pricing – Economic Capital calculation integrated with costing model for charge to allocated risk capital

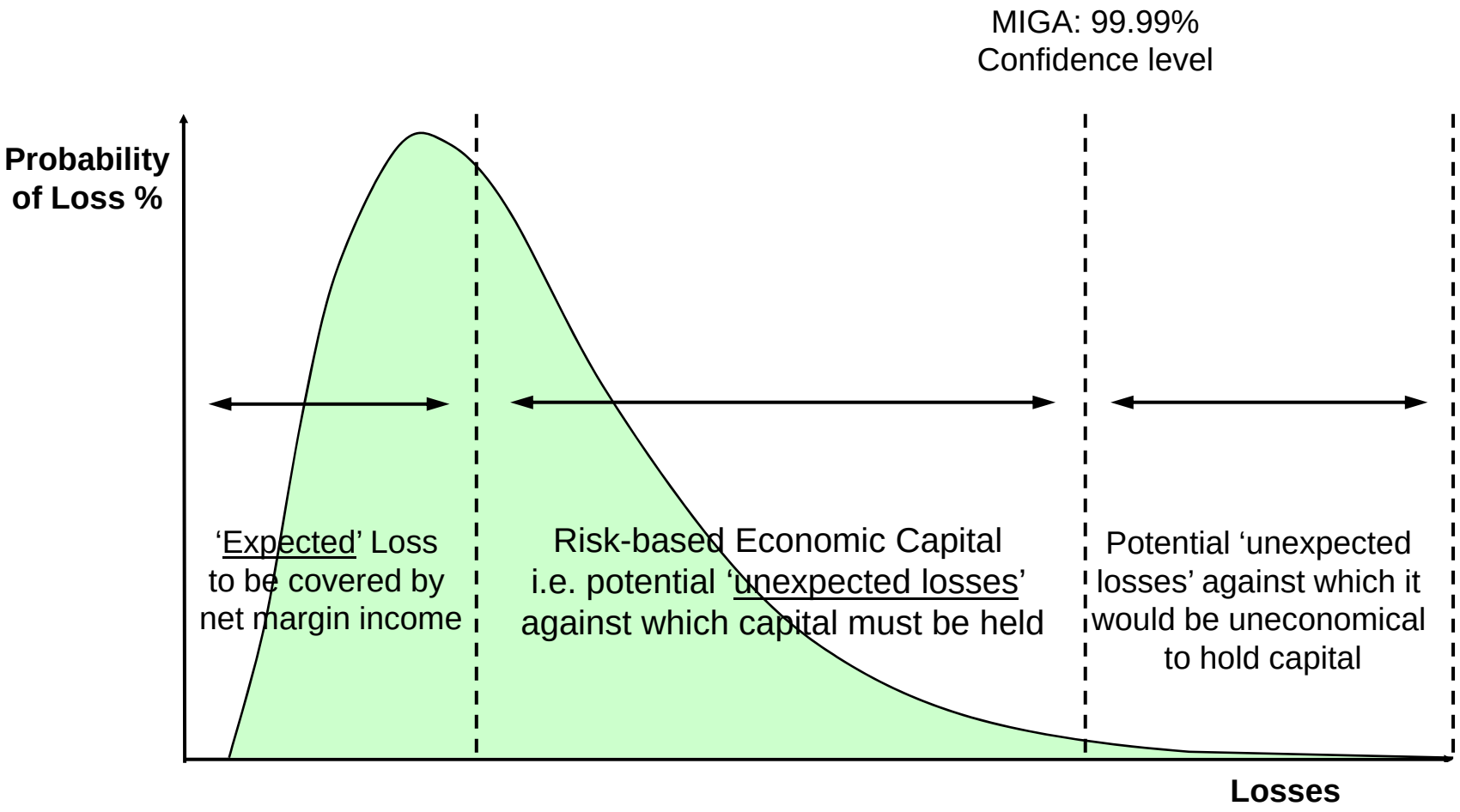
Financial Risk Management Framework Based on Economic Capital



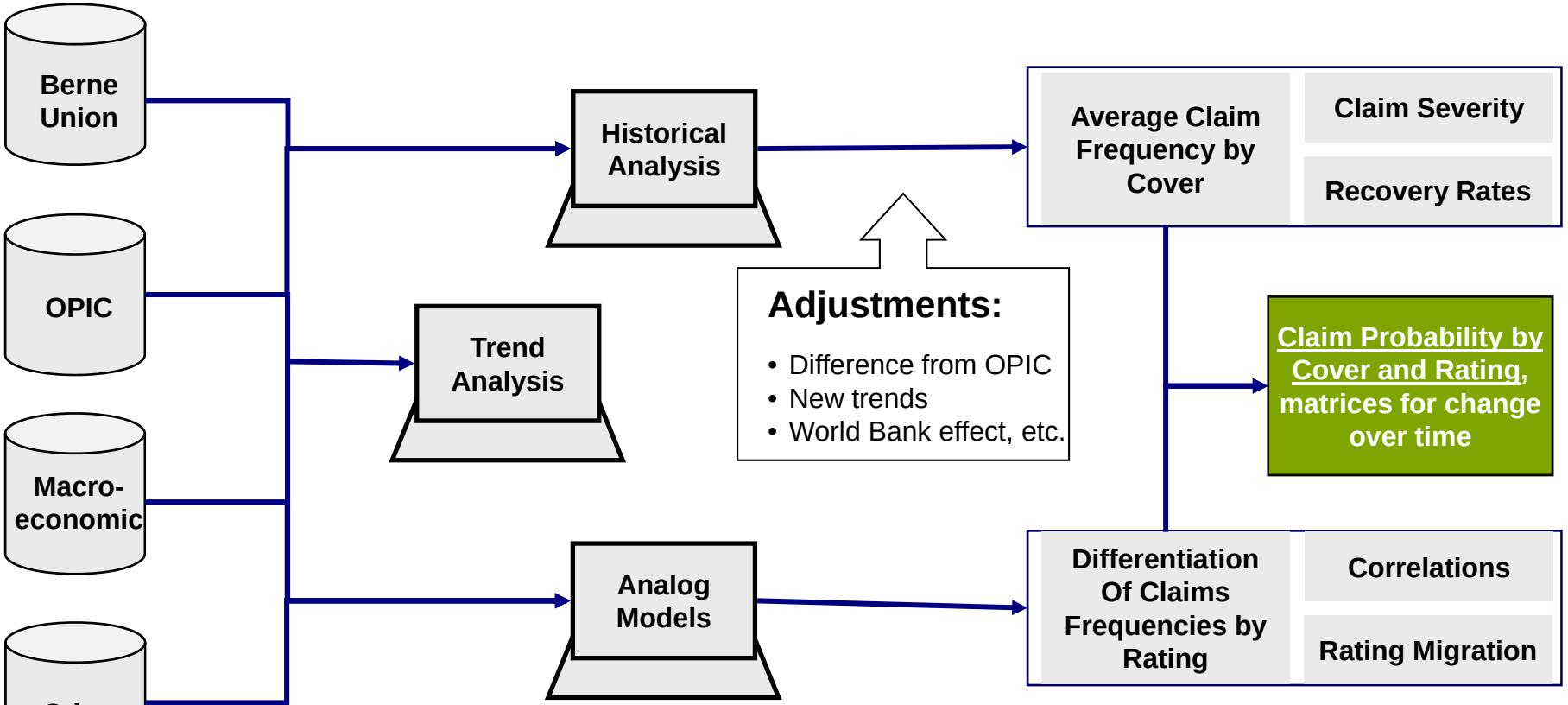
Pricing Based on Economic Capital is a Component of Overall Financial Risk Management Framework

- Economic Capital (EC) provides a uniform measure of risk, across clients, products, geographical areas, and risk types
- EC defined as the amount of capital MIGA should possess to be able to sustain larger than expected losses with a high degree of certainty, over a 1-year horizon, given risk exposures
  - The degree of certainty ("confidence level") is related to the desired risk profile.
  - MIGA uses a conservative 99.99%
  - Represents capital put at risk by the guarantee business, so should be charged a risk premium above "risk-free" rate
  - MIGA's model is similar to credit risk models in structure

Economic Capital – Derived from Loss Distribution of Guarantee Portfolio



Underlying Parameters: PRI Risk Data and Historical Claims Probability



Econometric models assign a "score" to a country/year, differentiating frequencies between risk classes of countries and building correlations, to predict probability of claimable events:

- Transfer, Expropriation, War & Civil disturbance

Interpretation of Quantitative EC Measures

- Key to MIGA's use of its risk models are the relative differences in risk capital consumption
  - These help in decision making
- Absolute dollar-amounts of economic capital less important than changes in consumption over time and across products
- MIGA doesn't strictly interpret the capital figures and management is mindful of shortcomings in terms of absolute measures
- Significant buffers of capital are kept over and above the modeled amounts
  - Recent experiences in financial markets point to the folly of relying too heavily on any risk models
- PRI Risk Models are not "correct" – they give indications
  - Modeled premium rates are not market-based

2. Use of Economic Capital for PRI Pricing, in MIGA's Context

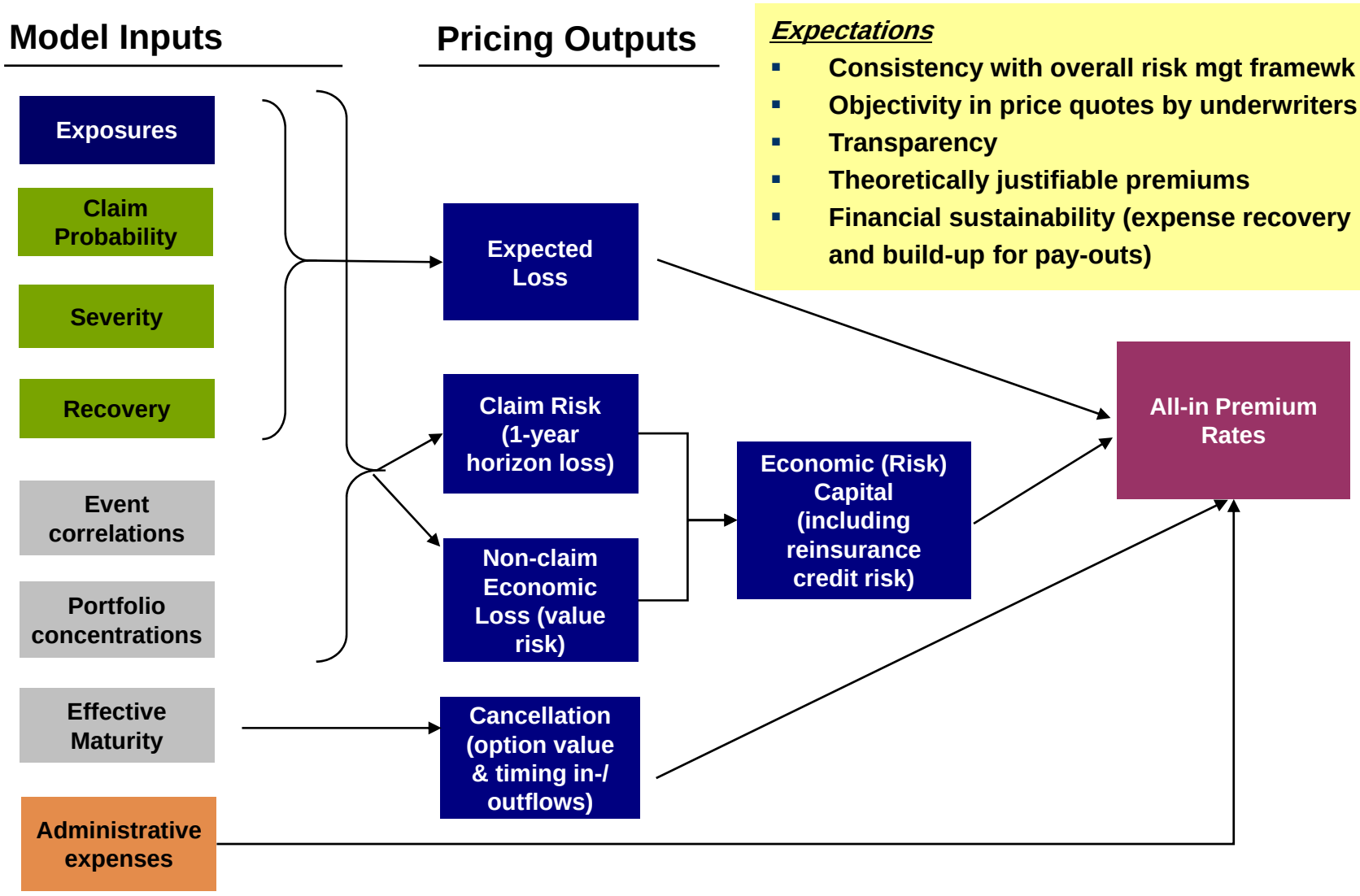
Use of Economic Capital in Pricing Decisions

- MIGA recently incorporated use of Economic Capital (EC) in pricing methodology
- Identifies contribution to systemic and idiosyncratic risk of each project and therefore able to determine how much capital needs to be allocated for a potential project relative to existing portfolio of business
- At each level of risk aggregation systemic and idiosyncratic risk are calculated
  - Systemic risk: resulting from common trends at a level of aggregation
  - Idiosyncratic risk: unrelated to other risks at a level of aggregation
- Accounts for country and project risk ratings, deal size, tenor, correlation structure as well as concentration effects due to existing exposure in country and region from existing portfolio
- EC Allocation used to calculate Risk Load component of PRI premium
  - “RAROC”, via allocated capital and hurdle rate
- EC use in pricing provides link to broader Risk Management Framework

MIGA's Pricing Objective and Cost Structure: 'Cost-plus'

- MIGA sets the premiums for its guarantees to cover both full administrative expenses (direct and portion of overhead) and risk (claims risk and reinsurer non-performance risk)
  - Expropriation *(modeled risk)*
  - Transfer restriction *(modeled risk)*
  - War and civil disturbance *(modeled risk)*
  - Breach of contract *(based on Expropriation risk)*
- Many of MIGA's markets are high risk
  - Focus on IDA-eligible (poorest) countries, frontier markets, investments between developing countries, infrastructure projects

Pricing Components – Inputs and Outputs



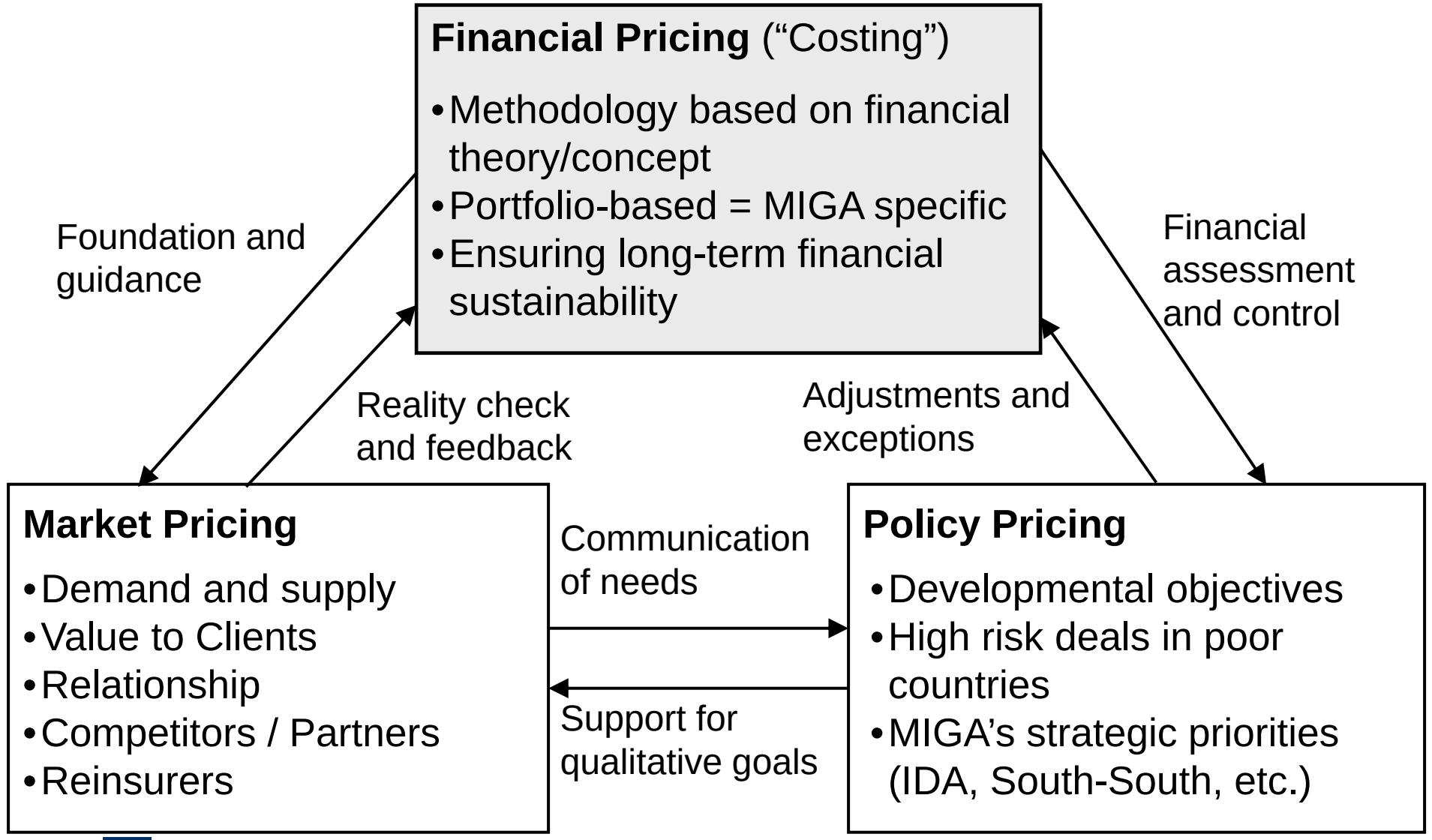
Unique Attributes of MIGA as PRI Provider

- Umbrella of deterrence means low frequency of claims filed
  - Benefit of being part of the World Bank Group
  - MIGA's shareholders are the countries who are also host countries of investments
  - Only small portion of MIGA-supported projects encounter difficulties
- Facilitation of settlement of disputes by in-house legal and risk staff
  - Host country motivated to find a solution (e.g. reputation and access to new financing)
- In-house environmental and social expertise, mainly extractive industries and infrastructure projects
- Utilization of resources and in-depth knowledge of emerging economies within World Bank Group – cost sharing arrangements (TA, Treasury etc)
- Cost of risk (claims) is thus lowered, but work to avoid disputes comes at the cost of higher administrative expenses

Interpretation of Modeled Premiums

- How should MIGA price its product to best achieve both its development and financial self-sustainability mandate?
- The EC-based, ‘cost-plus’ rates generated by the pricing model are provided to the underwriters, who compare it to the market, as well as to rates quoted in the reinsurance market
  - MIGA’s role is to complement private PRI providers
- In certain market conditions, e.g. with high liquidity or tight emerging market loan spreads, the model-generated rates may not always reflect going market rates, and may need to be adjusted

Actual Pricing is Driven by Model Outputs and Other Considerations



Thank You!

Additional Uses of EC in MIGA's Risk Management Framework

Reinsurance / Portfolio Exposure Management

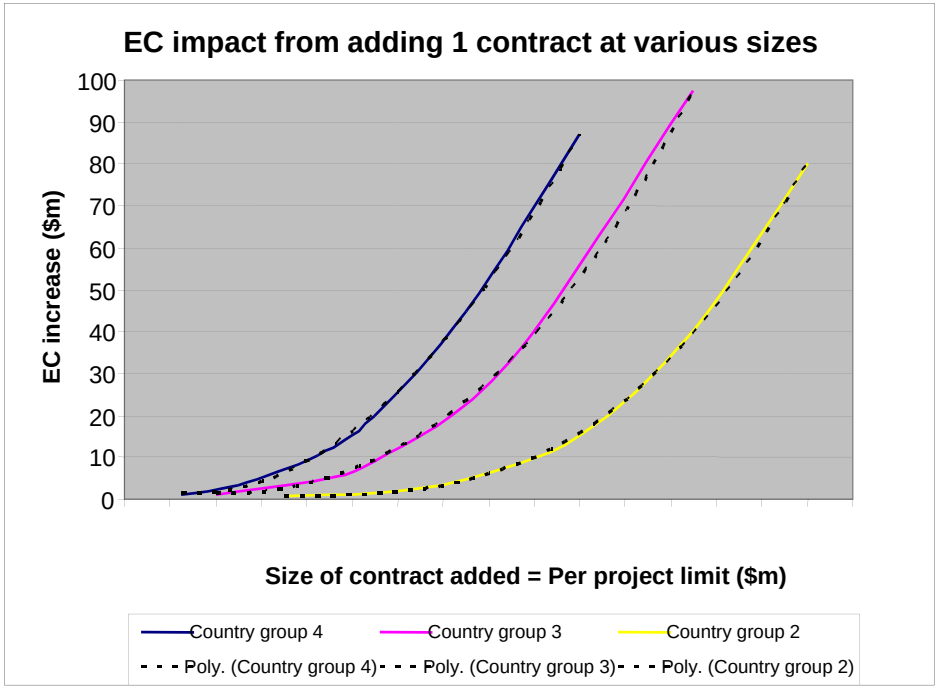
- As a common and objective measure of risk, EC captures comparative differences in contribution to portfolio risk by different projects in different countries
- Allows MIGA to make informed judgment on appropriate levels of exposure to retain on a deal by deal basis
- Used as the basis for country-differentiated standard retention levels in new treaty reinsurance agreements

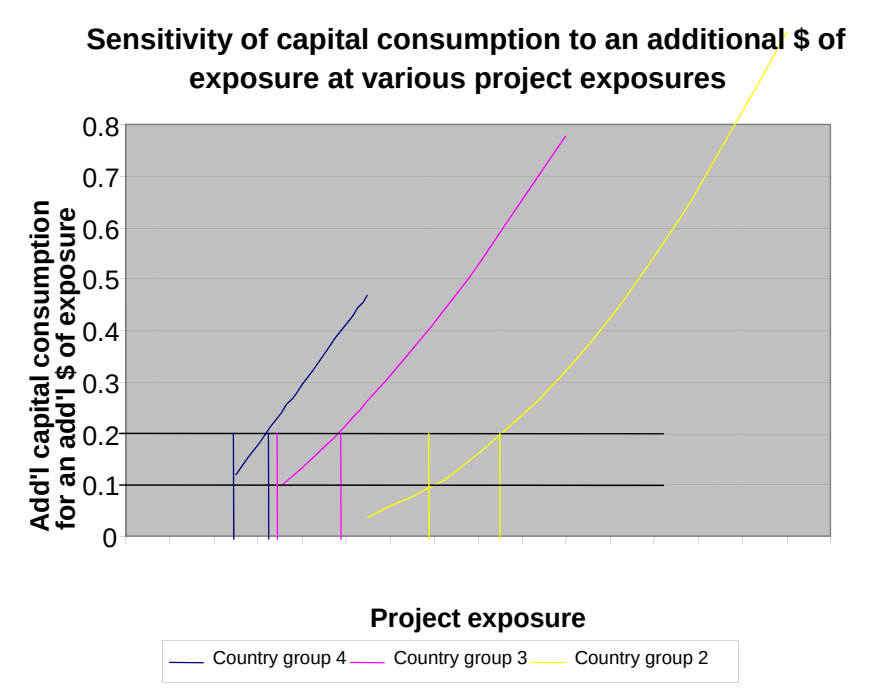
MIGA has Adopted an Economic Capital-based Exposure Limit System

- Project exposure limits differentiated by 4 country risk groups
- Desired exposure retention determined by assessing marginal portfolio risk level and impact on premium rate
  - Portfolio ratio: Economic capital / Net exposure
- In riskier country groups, adding more (net) exposure on MIGA's books can dramatically increase the risk of the portfolio
  - And the price of a contract would become prohibitively expensive (risk load component), due to high risk concentration in the country
- MIGA is able to retain a larger project exposure in a lower-risk country than in a higher-risk country, while maintaining the general risk level of the portfolio
  - Exposure over and above what MIGA prudently wants to hold for a contract is transferred (ceded) via reinsurance

Economic Capital-based Exposure Limit System: Analytics

- Limits set such that overall portfolio ratio of Economic Capital consumption to net exposure does not change materially (i.e. portfolio riskiness remains stable)
- This ratio is analyzed for each guarantee contract MIGA prices, along with impact on a contract's premium (risk premium depends on the chosen exposure to retain)





Detailed Portfolio Impact Analysis Helps Retention / Ceding Decision at Project Level

Net Retention Proposal 09/30/2008

Example 1
Country A

$200 million gross exposure, Loan contract, Finance sector, 12 year tenor.

Covers: EX (C+) TR (B+) WCD (B-) BOC

Portfolio Ecap / Net exposure as of 09/30/2008 , excluding this project: 7.04% ($250 million)

Example. Numbers are fictitious

Retention Scenarios for Country in Risk Group 3

	Retention level 1 $40	Retention level 2 $80	Retention level 3 $120	Retention level 4 $160
Ex-post Portfolio Ecap / Net exposure	7.01% ↘	7.00% ↘	7.05% ↗	7.26% ↗
Ecap Project	10.71	27.30	51.00	81.14
Ex-post Ecap Portfolio	252.00	254.19	259.04	269.52
Premium rate, Admin expenses	0.50%	0.45%	0.41%	0.37%
Premium rate, EX risk	0.25%	0.30%	0.35%	0.40%
Premium rate, TR risk	0.10%	0.15%	0.20%	0.25%
Premium rate, WCD risk	0.05%	0.06%	0.07%	0.08%
Project Premium rate (total, applicable covers)	**0.90%**	**0.96%**	**1.03%**	**1.10%**
Expected annual premium income at calculated rate (MIGA, net) if all exposure in current ($)	360,000	768,000	1,236,000	1,760,000
Expected annual income from reinsurer's ceding commission, this project ($)	313,200	257,280	193,640	118,800
Total expected annual income contribution, this project ($)	673,200	1,025,280	1,429,640	1,878,800
Remaining headroom towards internal standard country limit	210	170	130	90
Remaining headroom towards absolute country limit of $600 million **(before any run-off)**	310	270	230	190

- **The individual project's impact on the overall portfolio's risk level, as measured by EC/net exposure ratios, is analyzed**
- **Helps MIGA management decide on how much exposure to retain and how much to cede to reinsurers**
- **One project's retained exposure should not drive up the overall portfolio's risk substantially**
- **Other considerations also made, such as resulting premium rate (is project sellable?), annual revenue, and remaining headroom to set country exposure limits**