

Session 4 : Improving  
comparability and predictability  
through measurement

# Measurement of contingent liabilities

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# Why measure?

to **inform** the decision-making authority about the cost and risk of a particular contingent liability

to **monitor** any quantitative ceilings or limits set upon contingent liabilities.

to **disclose** statistics on contingent liabilities

to **calculate** the fiscal risk exposure of the government generating from the contingent liabilities

to **price** the instrument in question to decide upon the fee or premium to charge from the beneficiary

to **record** contingent liabilities in the public financial accounts

to **assess** the impact of the contingent liability on the risk sharing with the private partners in case of the PPPs

to **budget** for contingent liabilities



# Different measures of contingent liabilities

<b>Face value (maximum possible loss)</b>	<b>Maximum probable loss (cash flow at risk)</b>	<b>Expected loss</b>	<b>Unexpected loss</b>	<b>Market value</b>
Full nominal value of the contingent liability corresponding to the maximum possible loss	Maximum loss that may occur at a given confidence level, when the exposure is measured through probability distribution of losses	Present value of the expected future payments times their respective probabilities, the mean of the distribution of losses	Difference between the maximum probable loss and the expected loss indicating the risk of the contingent liability	Consists of the expected cost and the risk premium, corresponding to the price that the market would charge for the contingent liability



# Valuation methods – implicit valuation (indirect)

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**Gives the market value of the guarantee (includes the market risk premium)**

- If the beneficiary has previously issued bonds, the prices of these bonds indicate its credit risk
- Market value of a risk free government bond - market value of the bonds issued by the potential beneficiary = implicit market value of the guarantee
- If the beneficiary has not issued bonds, bond prices of comparable institutions can be used or if the recipient has a rating, the yield spread for that rating category can be used.
- Information needed may not be readily available.



# Valuation methods – option models (direct)

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**gives risk neutral valuation (does not include market risk premium)**

- A credit guarantee is regarded as a "put option" where the government gives the lenders the right to sell the loan at its face value in case the borrower defaults.
- To the lender, the value of the put option equals the value of a government guarantee.
- They provide analytical solutions.
- Information needed may not be readily available.
- Suitable for small amounts of guarantees where building simulation models might be seen unnecessary.



## **Valuation methods – simulation models (direct)**

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**gives risk neutral valuation (does not include market risk premium)**

- Fundamentally similar to option pricing
- A distribution of losses to the government from a guarantee is generated by these models
- This distribution is used to calculate the expected cost from the guarantee
- They are designed to take many considerations into account compared to more restrictive option pricing



# Approaches to credit risk analysis used by government risk managers

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- Credit scoring
  - Score cards are used, industry specific
  - Similar methodology used by rating agencies
- Statistical models
  - Aims at measuring default probability by using statistical techniques
  - Usually requires historical data
- Scenario analysis
  - Deterministic or random (stochastic, e.g. Monte Carlo simulation)
- Structural models
  - Option pricing theory is used to calculate default probability of an entity
  - Difficult to estimate the underlying parameters



## Country practices

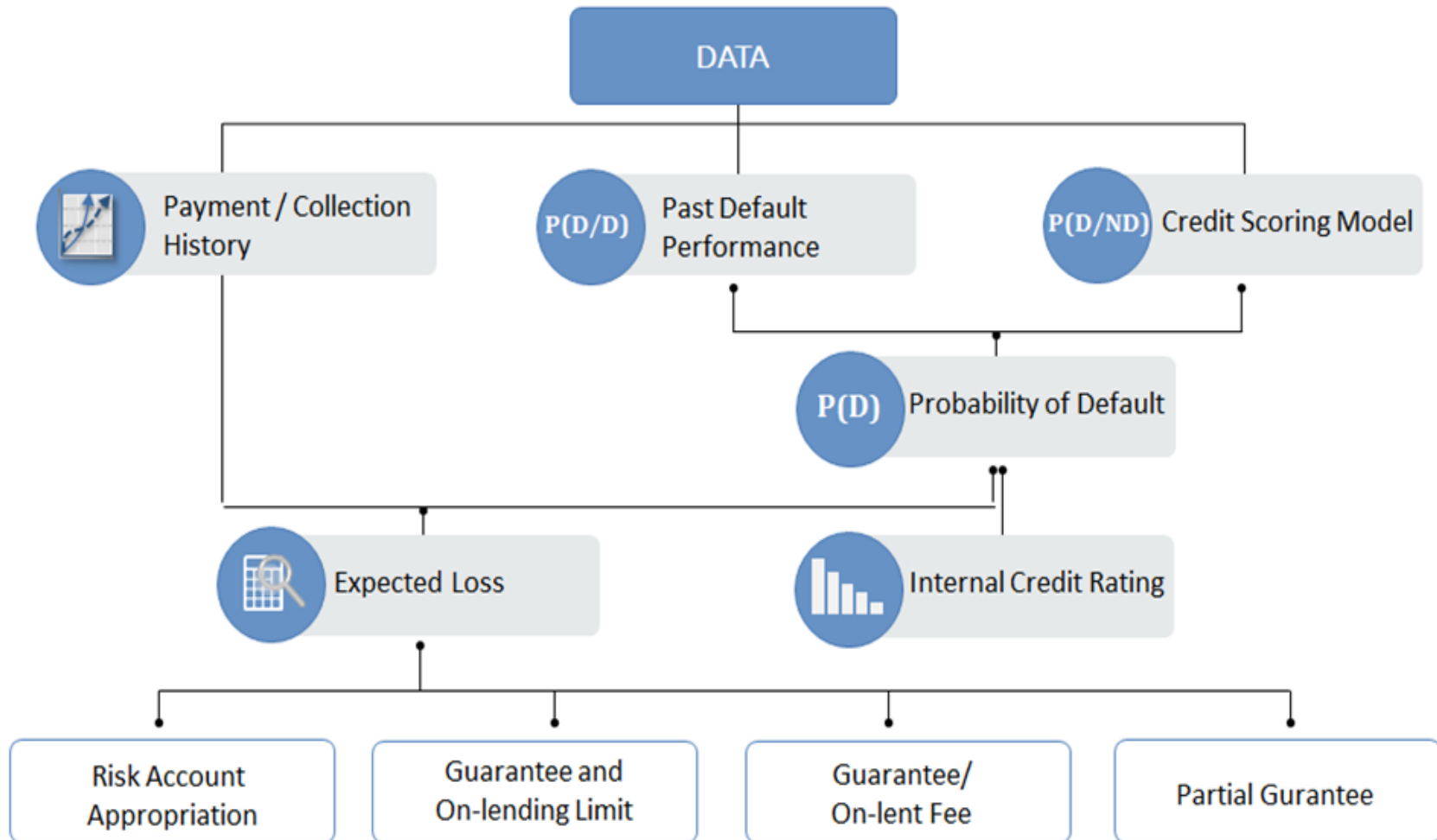
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- The choice among valuation techniques depends on the structure of the guarantee + availability of data
- Countries adopt different analytical techniques which are usually a combination of these methods (credit scoring and statistical approaches are used in South Africa and Turkey, simulation and option models are used in Chile for example)





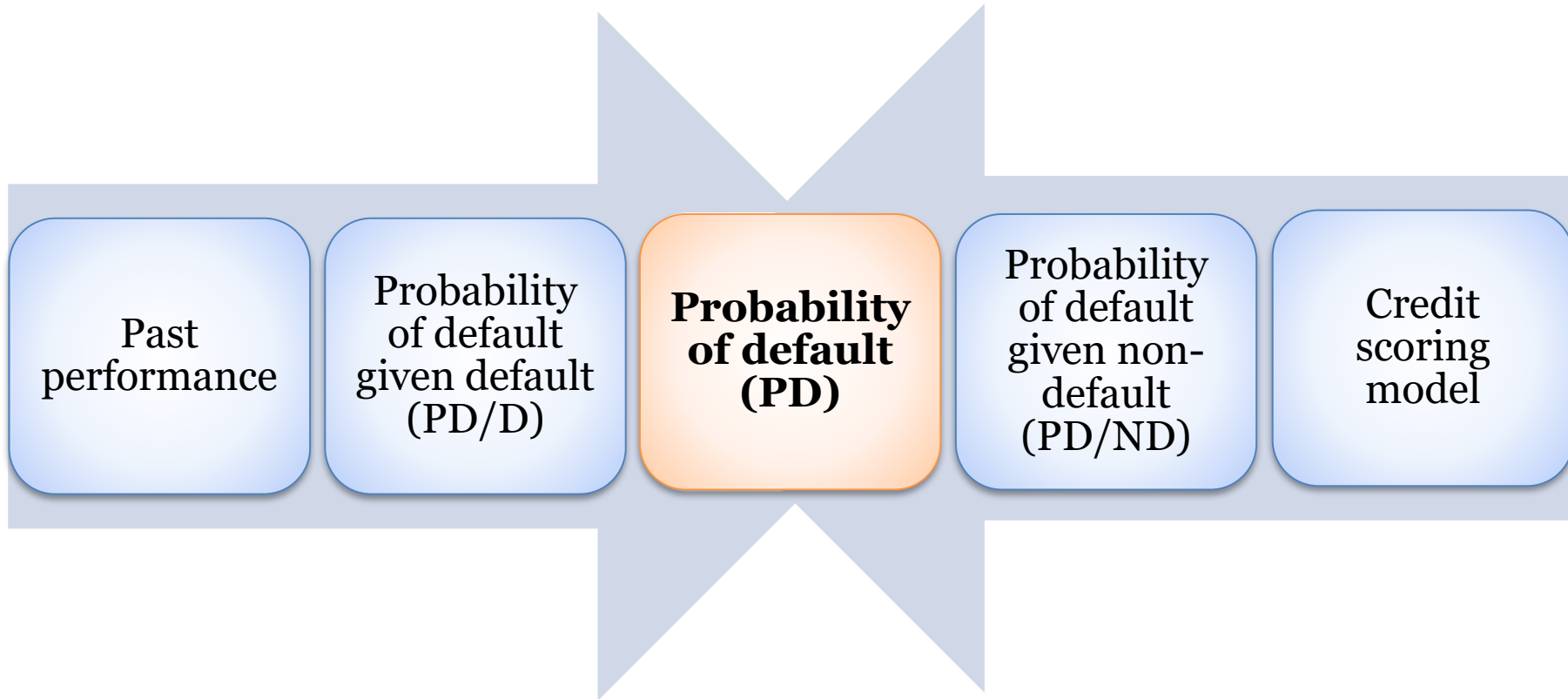
# Example of Turkey – Credit Rating Model



Source: Turkish Treasury



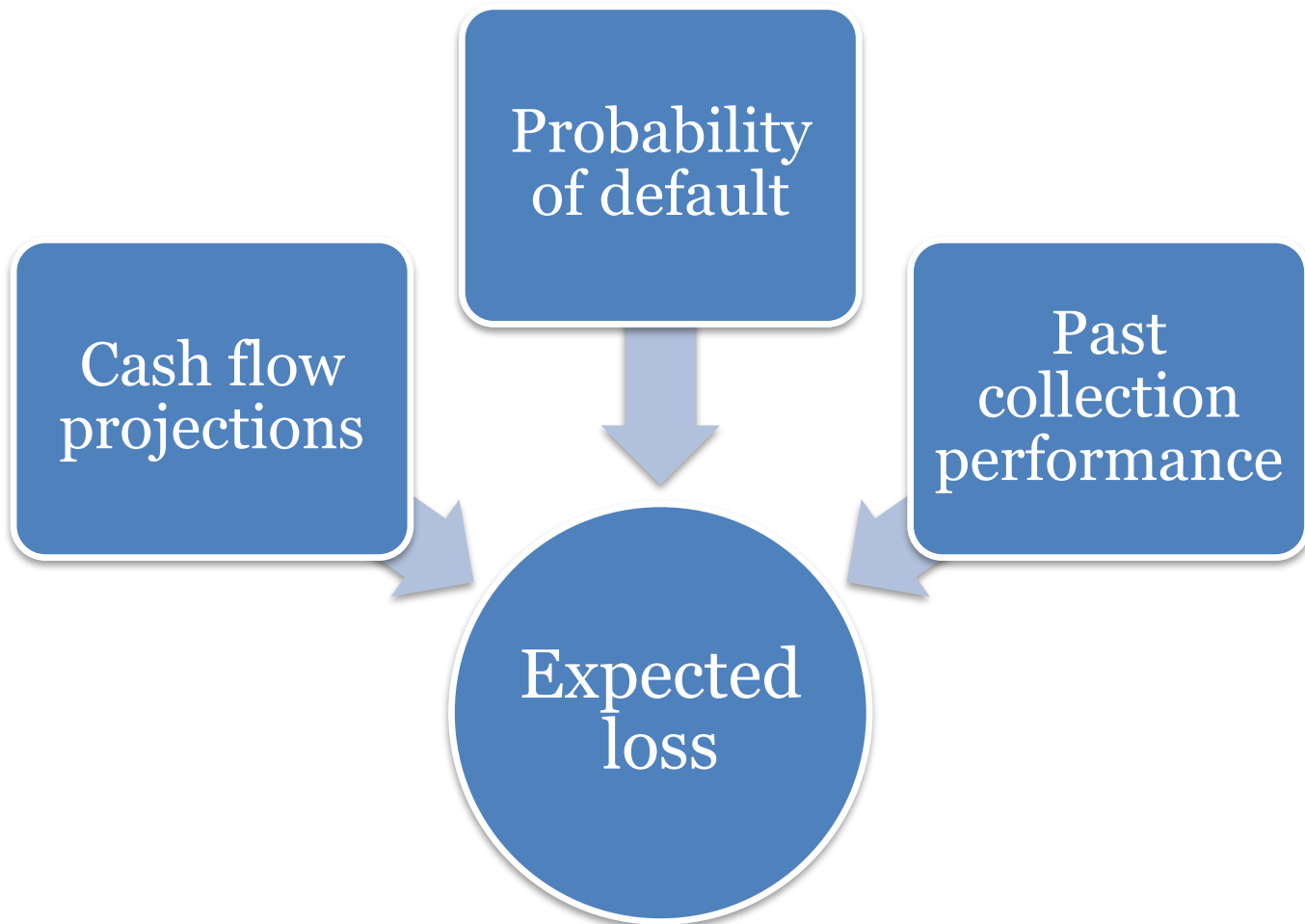
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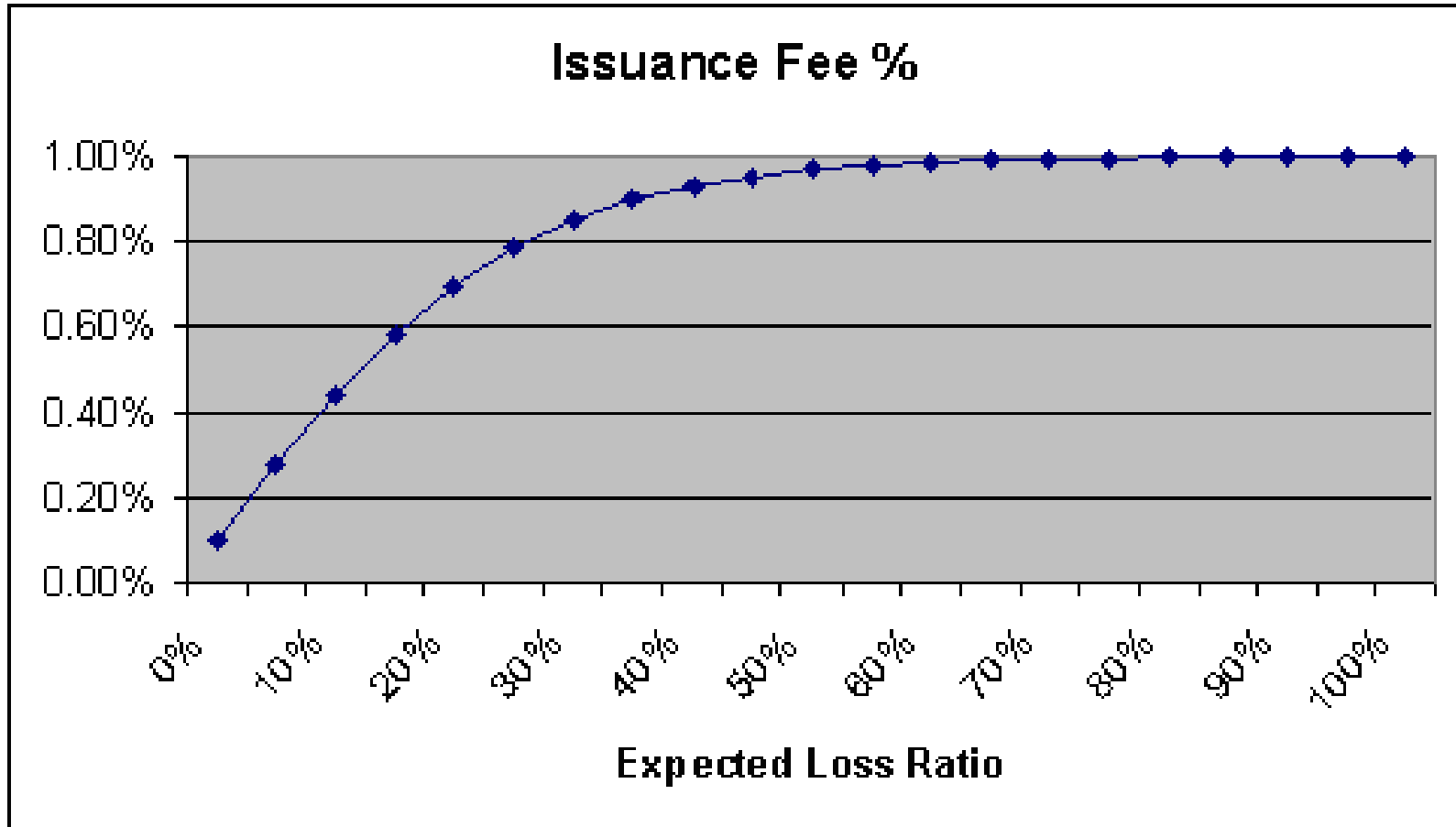
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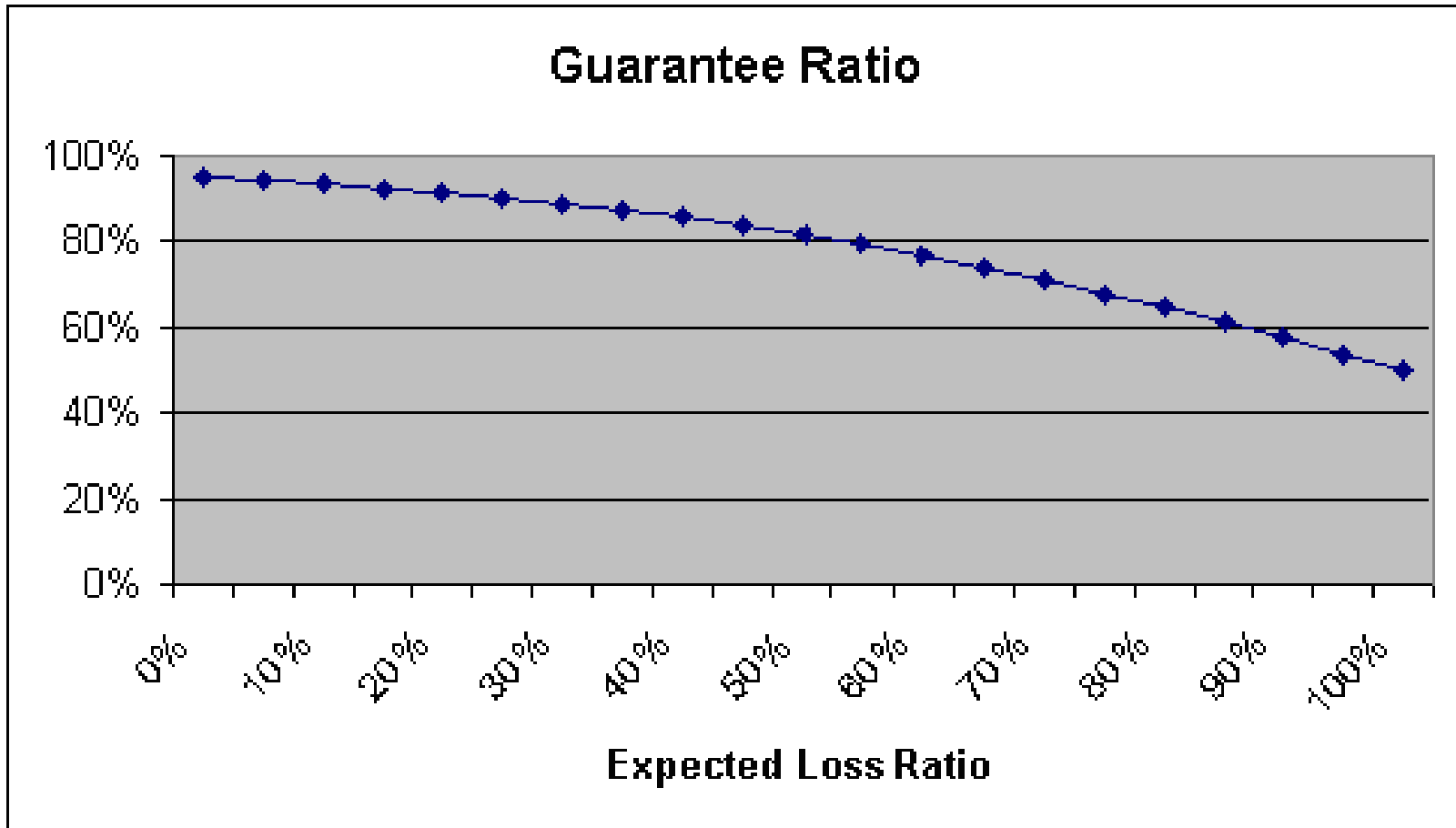
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Thank you for your attention...