

4º Workshop Duxus de Risco

Notas de Risco.



Basel MAR 40

Modelo Simplificado Padronizado (MPAD)

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Rodrigo Leme de Oliveira



MPAD

JUR1

JUR2

JUR3

JUR4

ACS

CAM

COM

Resolução nº 2.692
(2000)

Resolução nº 2.099
(1994)

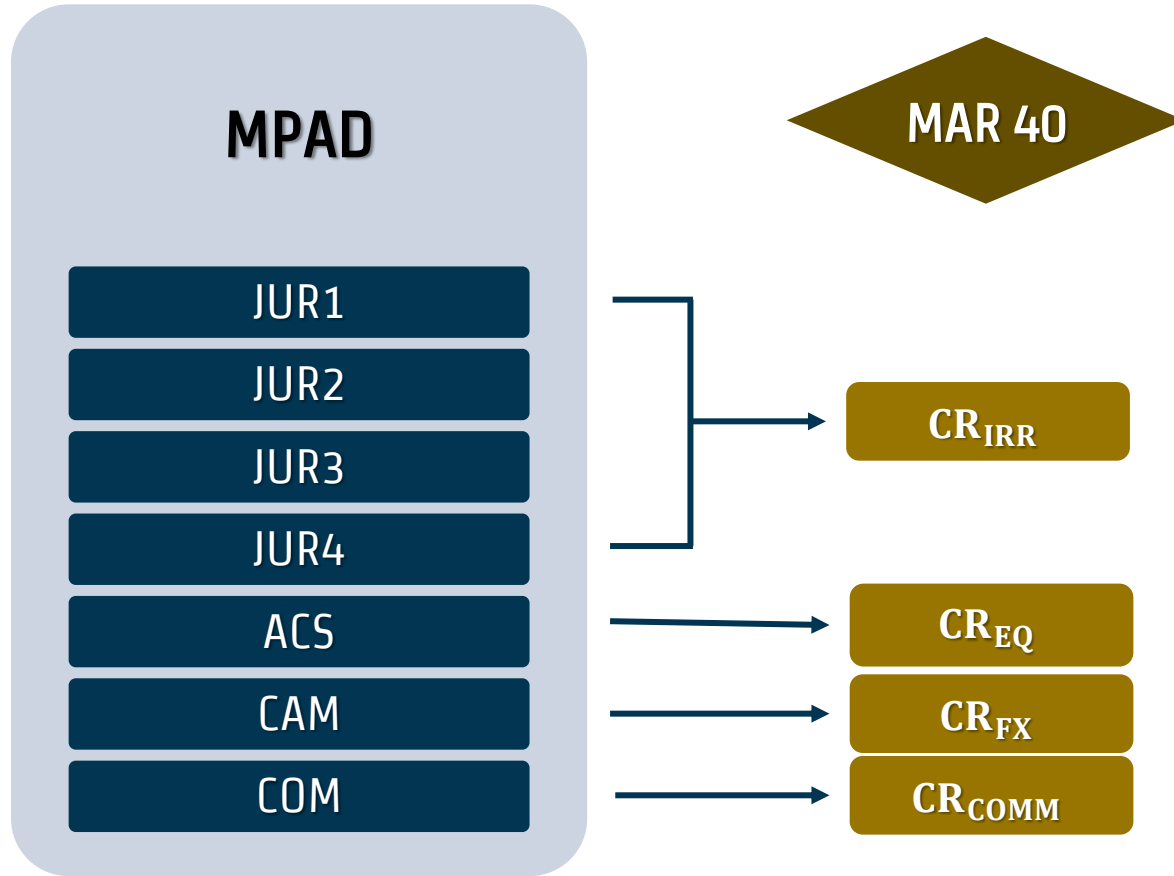
$$PLE = F \cdot \text{Apr} + F' \cdot S \cdot \text{RCD} + F'' \cdot \max \left(\left(S \cdot \text{Aprc} - 0,2 \cdot \text{PLA} \right); 0 \right) + S \cdot \text{EC}$$

$\begin{matrix} n1 & n2 & n3 \\ i=1 & i=1 & i=1 \end{matrix}$

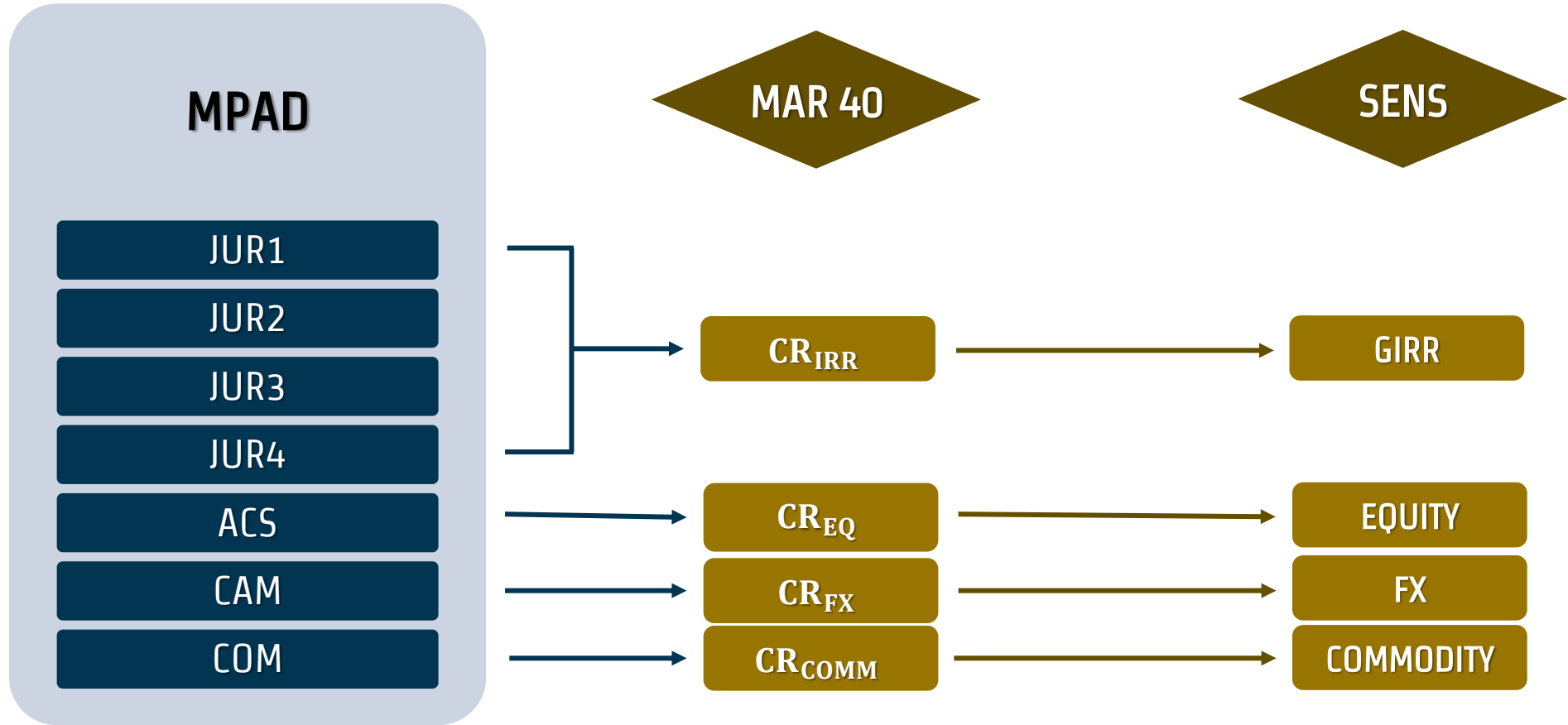
Circular nº 2.972
(2000)

$$EC_{[Juris Prd]} = \max \left\{ \left(\frac{M_t}{60} \sum_{i=1}^{60} VaR_{t-i}^{\text{Padrão}} \right), VaR_{t-1}^{\text{Padrão}} \right\}$$

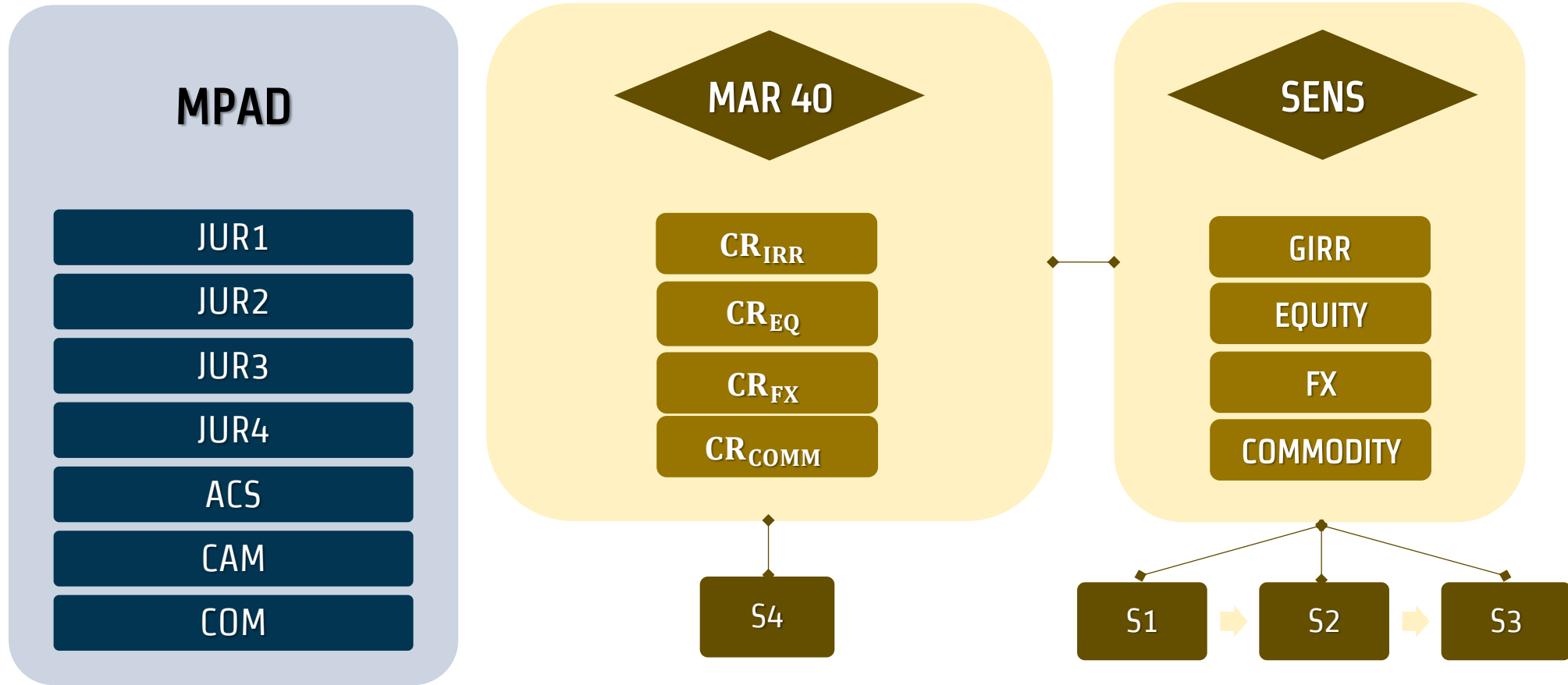
Basel MAR 40 – Nova Estrutura de Requerimento de Capital



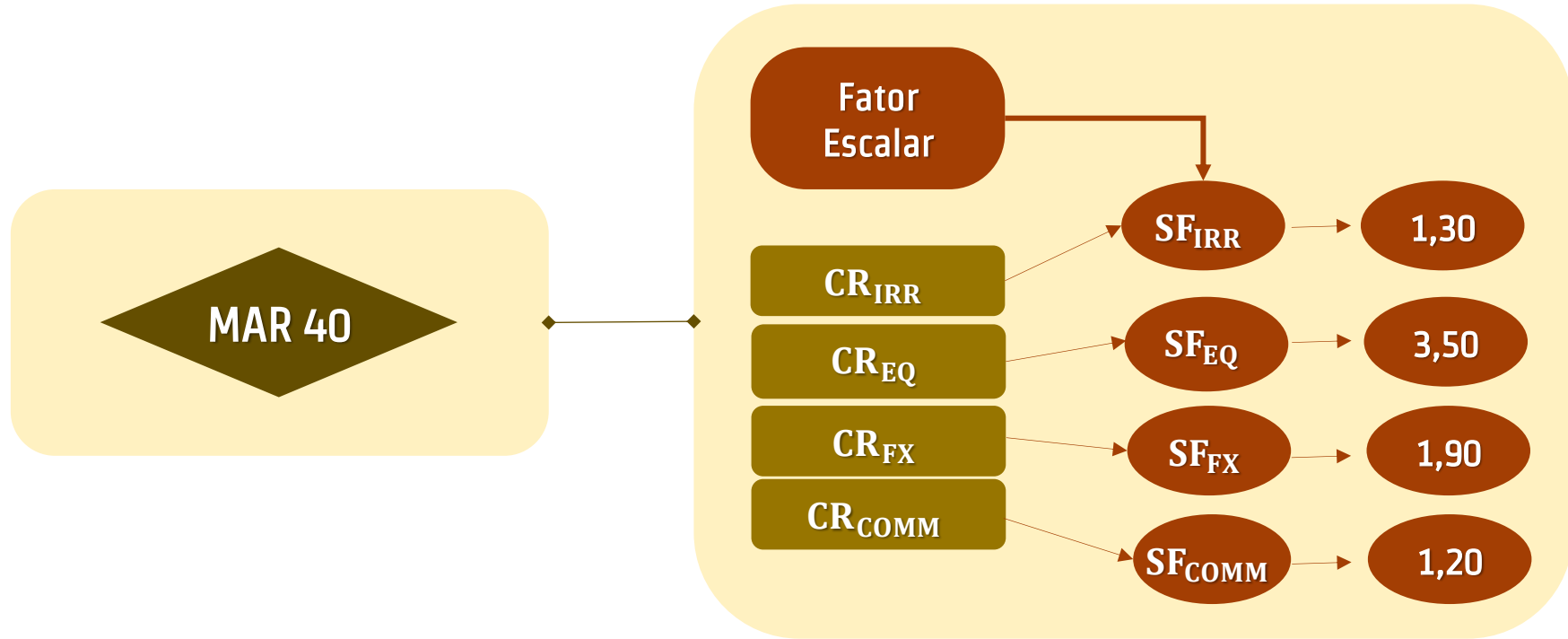
Basel MAR 40 – Nova Estrutura de Requerimento de Capital

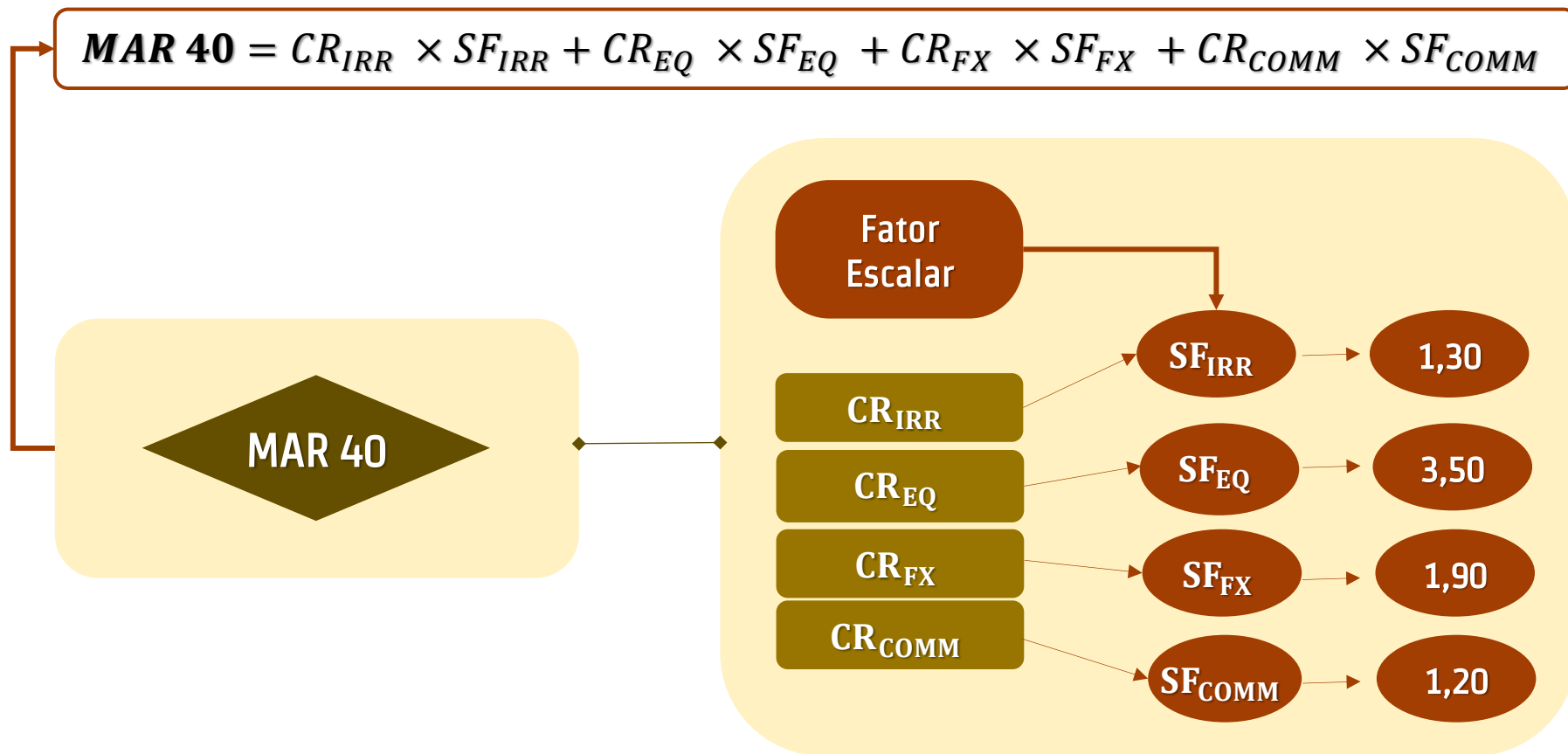


Basel MAR 40 – Nova Estrutura de Requerimento de Capital

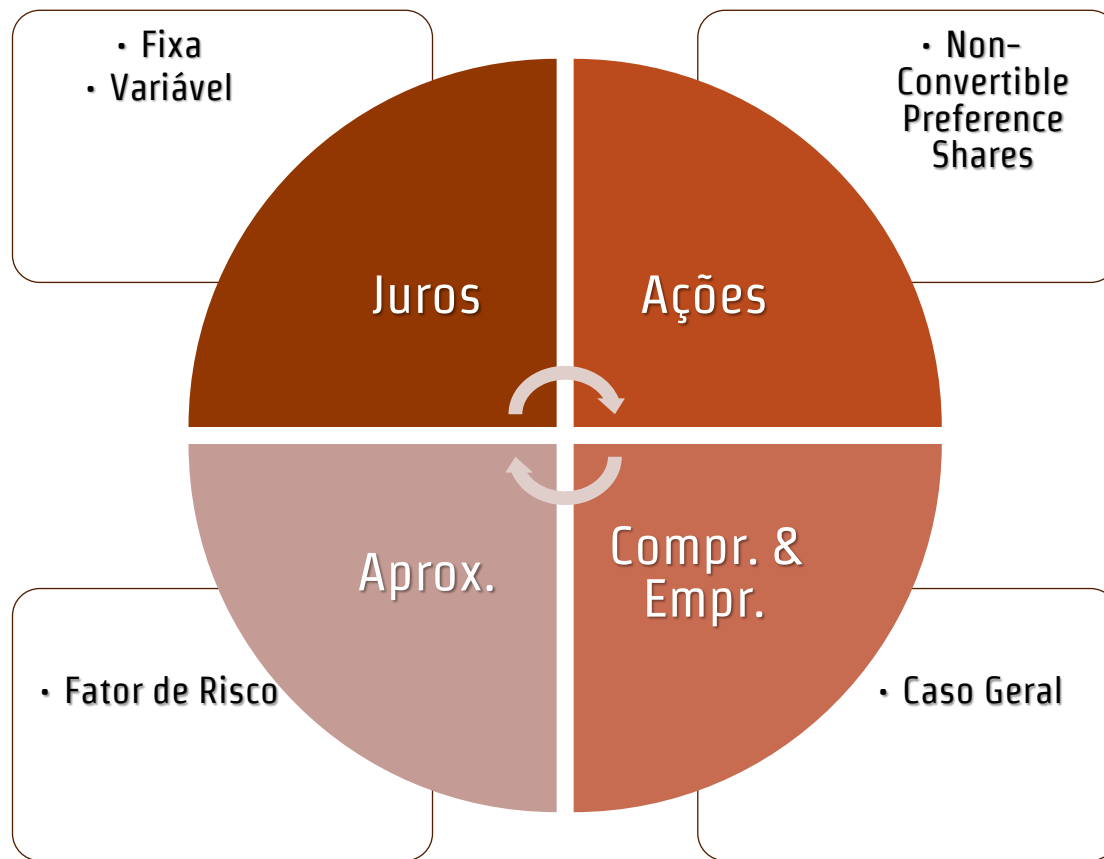


Basel MAR 40 – Nova Estrutura de Requerimento de Capital





CR_{IRR}



Modelo



$$CR_{IRR} = f(\text{Risco}_{\text{Específico}}; \text{Risco}_{\text{Mercado}})$$

Modelo



$$CR_{IRR} = f(\text{Risco}_{\text{Específico}}; \text{Risco}_{\text{Mercado}})$$

$$\text{Risco}_{\text{Específico}} = f\left(\begin{matrix} \text{Contraparte}_{\text{País}}; \\ \text{Rating}_{\text{Externo}}; \\ \text{Prazo}_{\text{Residual}} \end{matrix}\right)$$

Tabela 1

Basel MAR 40 – CR_{IRR} – Risco Específico



Specific risk capital requirements for issuer risk
Government and “other” categories

Table 1

Categories	External credit assessment	Specific risk capital requirement
Government	AAA to AA–	0%
	A+ to BBB–	0.25% (residual term to final maturity 6 months or less)
		1.00% (residual term to final maturity greater than 6 and up to and including 24 months)
		1.60% (residual term to final maturity exceeding 24 months)
	BB+ to B–	8.00%
	Below B–	12.00%
Qualifying	Unrated	8.00%
		0.25% (residual term to final maturity 6 months or less)
		1.00% (residual term to final maturity greater than 6 and up to and including 24 months)
		1.60% (residual term to final maturity exceeding 24 months)
Other	BB+ to BB–	8.00%
	Below BB–	12.00%
	Unrated	8.00%

Critérios de Qualificação (Qualifying)

Títulos referentes ao Setor Público

- Exceto Soberanos

1

Bancos Internacionais de Desenvolvimento

- Critérios CRE (229)

2

Títulos de Entidades IG

- Em ao menos 2 agências
- $\geq$ Baa – Moody's
- $\geq$ BBB – Standard & Poor's

3

Títulos de Entidades ND

- Grau de Investimento
(Emissor)
- Lista em Bolsa ou Balcão

4

Títulos de Entidades IG

- Em ao menos 1 agência
- Não inferior para outra

Tratamentos Adicionais (Faculdades)

Securitizações

- Enquadramento CRE
- Fator dividido por 12,5

1

Derivativos de Crédito

- Exposição = Perda Máxima
- = Securitizações

2

Mitigação DC

- Total = Inversamente proporcional
- Deve ser simétrico

3

Títulos de Entidades IG

- Em ao menos 1 agência
- Não inferior para outra

4

Mitigação por CDS

- Compensação de 80%
- Pontas simétricas
- Inversamente proporcional

5

Outros Tratamentos

- Nth-o-default Credit Derivative
- Carteira de Correlação (CTP)

Modelo



$$CR_{IRR} = f(\text{Risco}_{\text{Específico}}; \text{Risco}_{\text{Mercado}})$$

$$\text{Risco}_{\text{Mercado}} = f(\text{Maturity Method})$$

OU

$$\text{Risco}_{\text{Mercado}} = f(\text{Duration Method})$$

Características Gerais *Maturity Method | Duration Method*



Características Gerais Elementos essenciais



Basel MAR 40 – CR_{IRR} – Risco de Mercado: *Maturity Method*

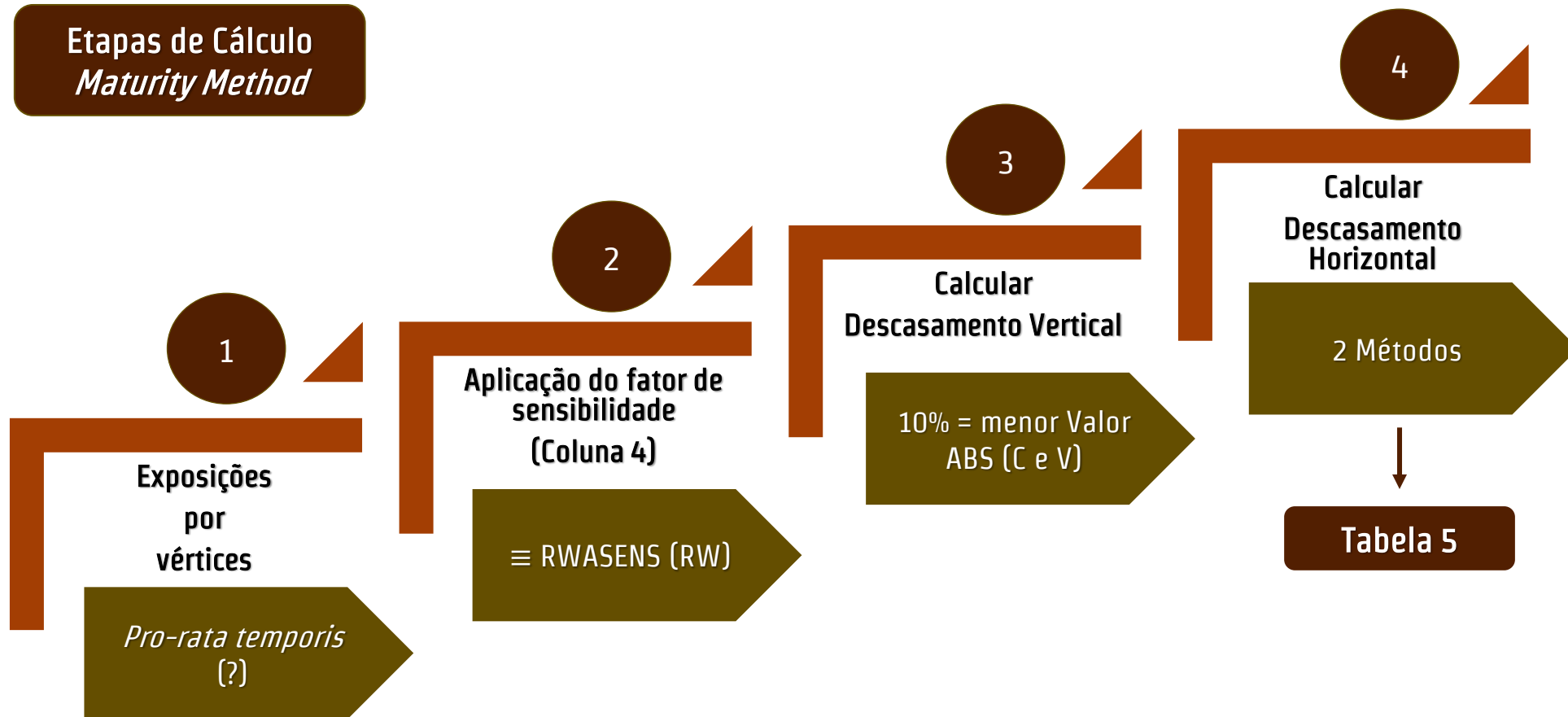


Maturity method: time bands and weights

Table 4

Coupon 3% or more	Coupon less than 3%	Risk weight	Assumed changes in yield
1 month or less	1 month or less	0.00%	1.00
1 to 3 months	1 to 3 months	0.20%	1.00
3 to 6 months	3 to 6 months	0.40%	1.00
6 to 12 months	6 to 12 months	0.70%	1.00
1 to 2 years	1.0 to 1.9 years	1.25%	0.90
2 to 3 years	1.9 to 2.8 years	1.75%	0.80
3 to 4 years	2.8 to 3.6 years	2.25%	0.75
4 to 5 years	3.6 to 4.3 years	2.75%	0.75
5 to 7 years	4.3 to 5.7 years	3.25%	0.70
7 to 10 years	5.7 to 7.3 years	3.75%	0.65
10 to 15 years	7.3 to 9.3 years	4.50%	0.60
15 to 20 years	9.3 to 10.6 years	5.25%	0.60
Over 20 years	10.6 to 12 years	6.00%	0.60
	12 to 20 years	8.00%	0.60
	Over 20 years	12.50%	0.60

Etapas de Cálculo *Maturity Method*



Basel MAR 40 – CR_{IRR} – Risco Mercado: Descasamento Horizontal



Horizontal disallowances					Table 5	
Zones	Time band	Within the zone	Between adjacent zones	Between zones 1 and 3		
Zone 1	0-1 month	40%	40%	100%		
	1-3 months					
	3-6 months					
	6-12 months					
Zone 2	1-2 years	30%			40%	100%
	2-3 years					
	3-4 years					
	4-5 years					
Zone 3	5-7 years	30%	40%	100%		
	7-10 years					
	10-15 years					
	15-20 years					
	Over 20 years					

Síntese *Maturity Method*



Metodologia

- Semelhante ao MPAD atual
- RWA JUR 2, 3 e 4

MPAD Atual

$$RWA_{JUR4} = \frac{M^{jur}}{F} \cdot \left[\sum_{t=1}^{t1} \left(\sum_{i=1}^{11} EL_i \right) + \sum_{i=1}^{11} |DV_i| + \sum_{j=1}^3 |DHZ_j| + DHE \right]_t$$



Novo Ingrediente

- Sensibilidade presumida por MTM $\equiv$ RWASENS
- $\equiv$ Fatores Mjur e Mext

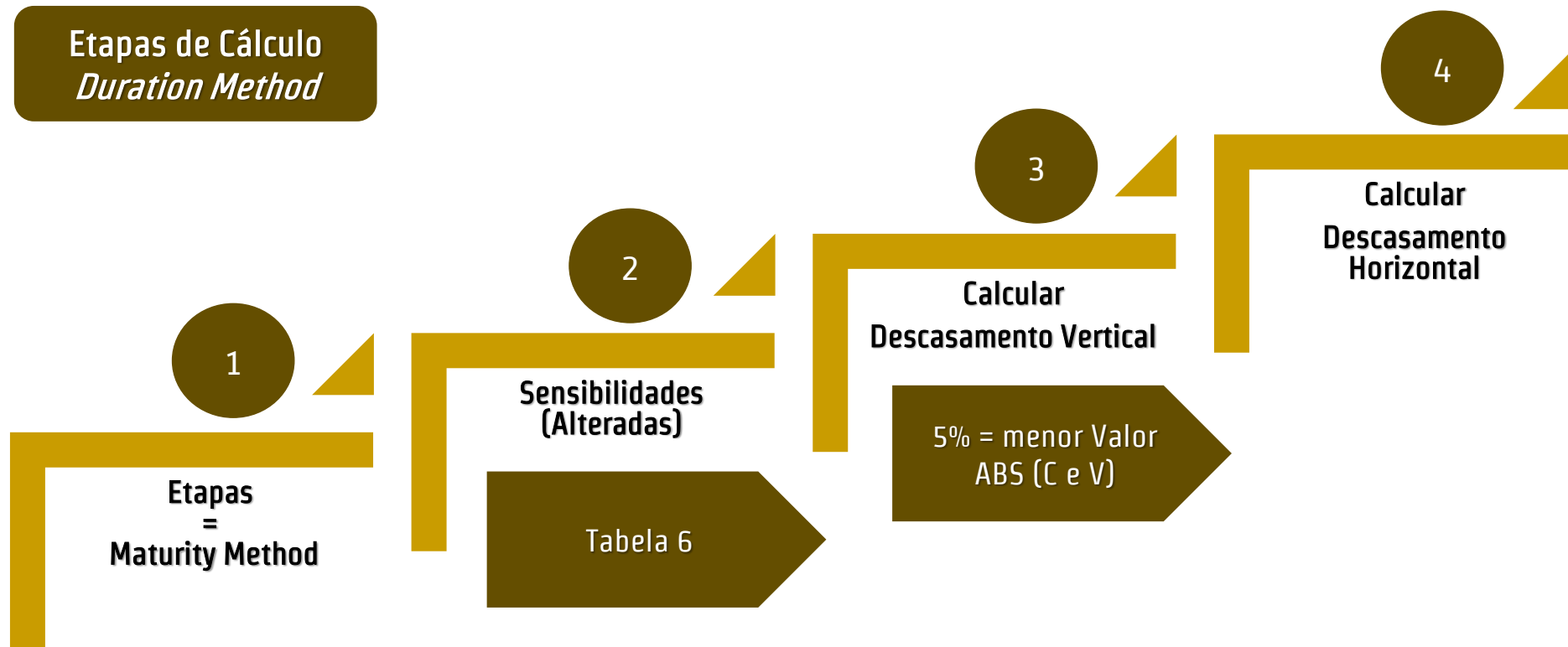


$$RWA_{JUR2} = \frac{M^{ext}}{F} \cdot \left[\sum_{k=1}^{m1} \left(\sum_{i=1}^{11} EL_i \right) + \sum_{i=1}^{11} |DV_i| + \sum_{j=1}^3 |DHZ_j| + DHE \right]_k$$



Descasamento Horizontal

- Soma Integral (Componente Único)
- Hoje DHE e DHZ



Duration method: time bands and assumed changes in yield

Table 6

	Assumed change in yield		Assumed change in yield
Zone 1:		Zone 3:	
1 month or less	1.00	3.6 to 4.3 years	0.75
1 to 3 months	1.00	4.3 to 5.7 years	0.70
3 to 6 months	1.00	5.7 to 7.3 years	0.65
6 to 12 months	1.00	7.3 to 9.3 years	0.60
Zone 2:		9.3 to 10.6 years	0.60
1.0 to 1.9 years	0.90	10.6 to 12 years	0.60
1.9 to 2.8 years	0.80	12 to 20 years	0.60
2.8 to 3.6 years	0.75	Over 20 years	0.60

Basel MAR 40 – CR_{IRR} – Tratamento para Derivativos

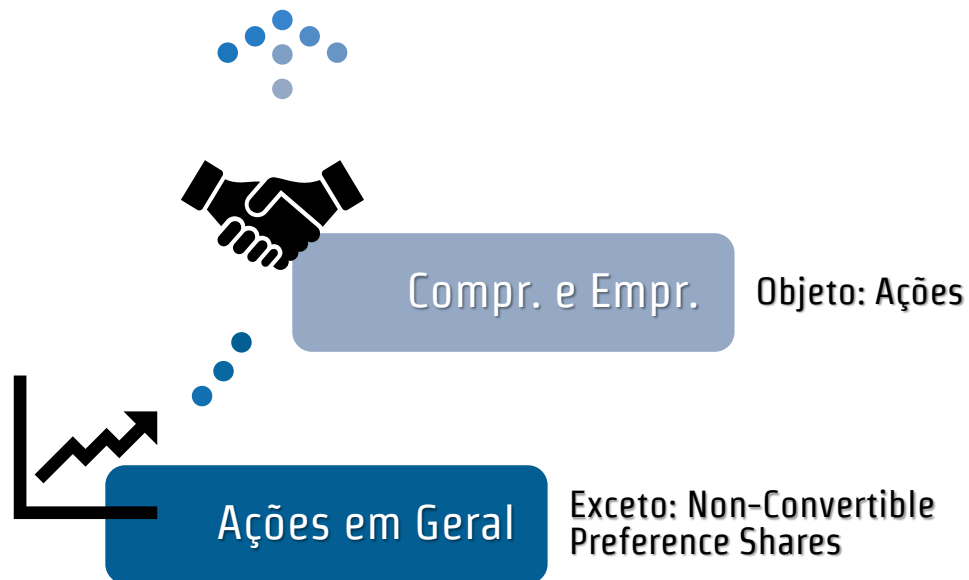


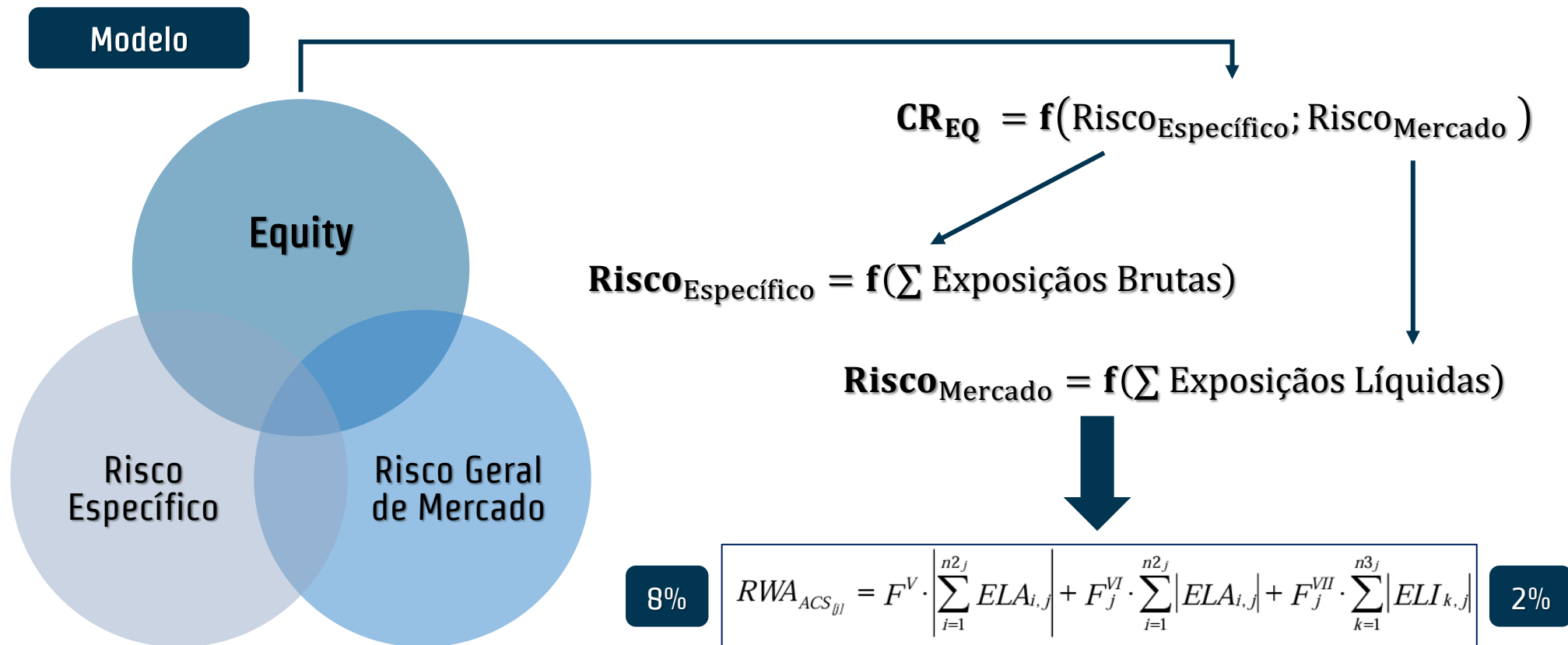
Summary of treatment of interest rate derivatives

Table 7

Instrument	Specific risk charge	General market risk charge
Exchanged-traded future		
Government debt security	Yes	Yes, as two positions
Corporate debt security	Yes	Yes, as two positions
Index on interest rates (eg LIBOR)	No	Yes, as two positions
Over-the-counter (OTC) forward		
Government debt security	Yes	Yes, as two positions
Corporate debt security	Yes	Yes, as two positions
Index on interest rates	No	Yes, as two positions
FRAs, swaps	No	Yes, as two positions
Forward FX	No	Yes, as one position in each currency
Options		Either
Government debt security	Yes	(a) carve out together with the associated hedging positions: simplified approach; scenario analysis; internal models
Corporate debt security	Yes	
Index on interest rates	No	(b) general market risk charge according to the delta-plus method (gamma and vega should receive separate capital requirements)
FRAs, swaps	No	

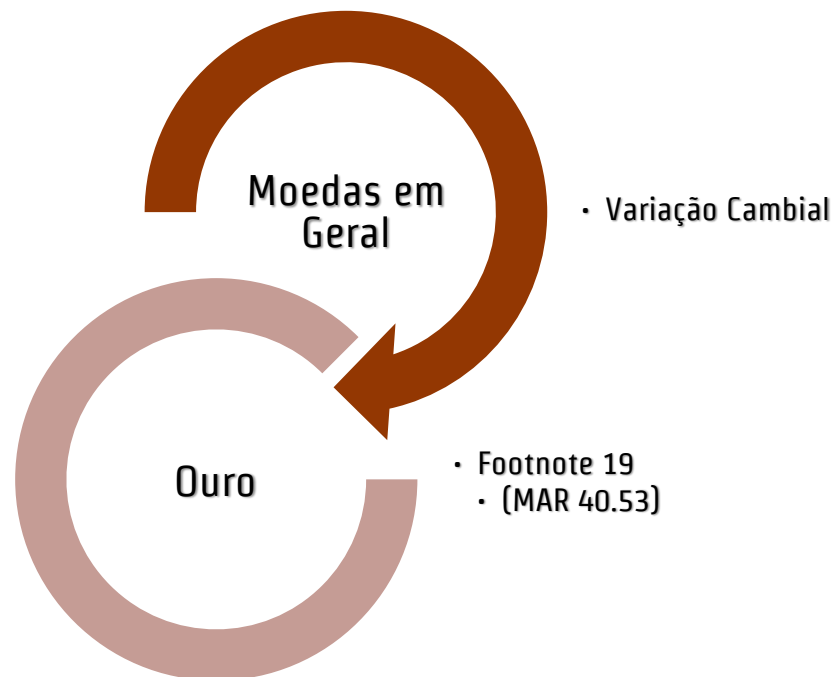
CR_{EQ}



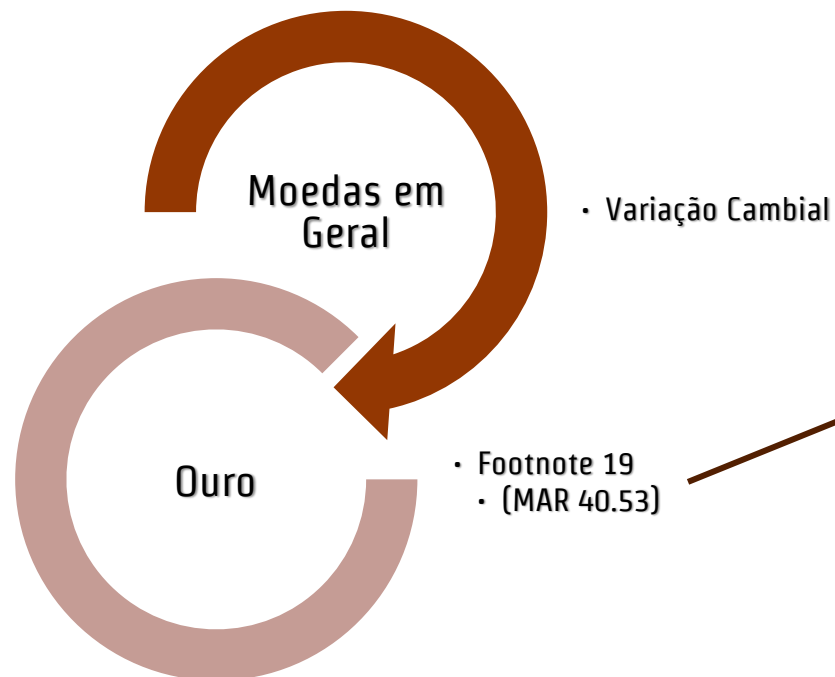


Summary of treatment of equity derivatives			Table 8
Instrument	Specific risk	General market risk	
Exchanged-traded or OTC future			
Individual equity	Yes	Yes, as underlying	
Index	2%	Yes, as underlying	
Options		Either	
Individual equity	Yes	(a) carve out together with the associated hedging positions: simplified approach; scenario analysis; internal models	
Index	2%	(b) general market risk charge according to the delta-plus method (gamma and vega should receive separate capital requirements)	

CR_{FX}



CR_{FX}



Foreign exchange risk

40.53

This section sets out the simplified standardised approach for measuring the risk of holding or taking positions in foreign currencies, including gold.¹⁹

1 Footnote

¹⁹ Gold is to be dealt with as an FX position rather than a commodity because its volatility is more in line with foreign currencies and banks manage it in a similar manner to foreign currencies.

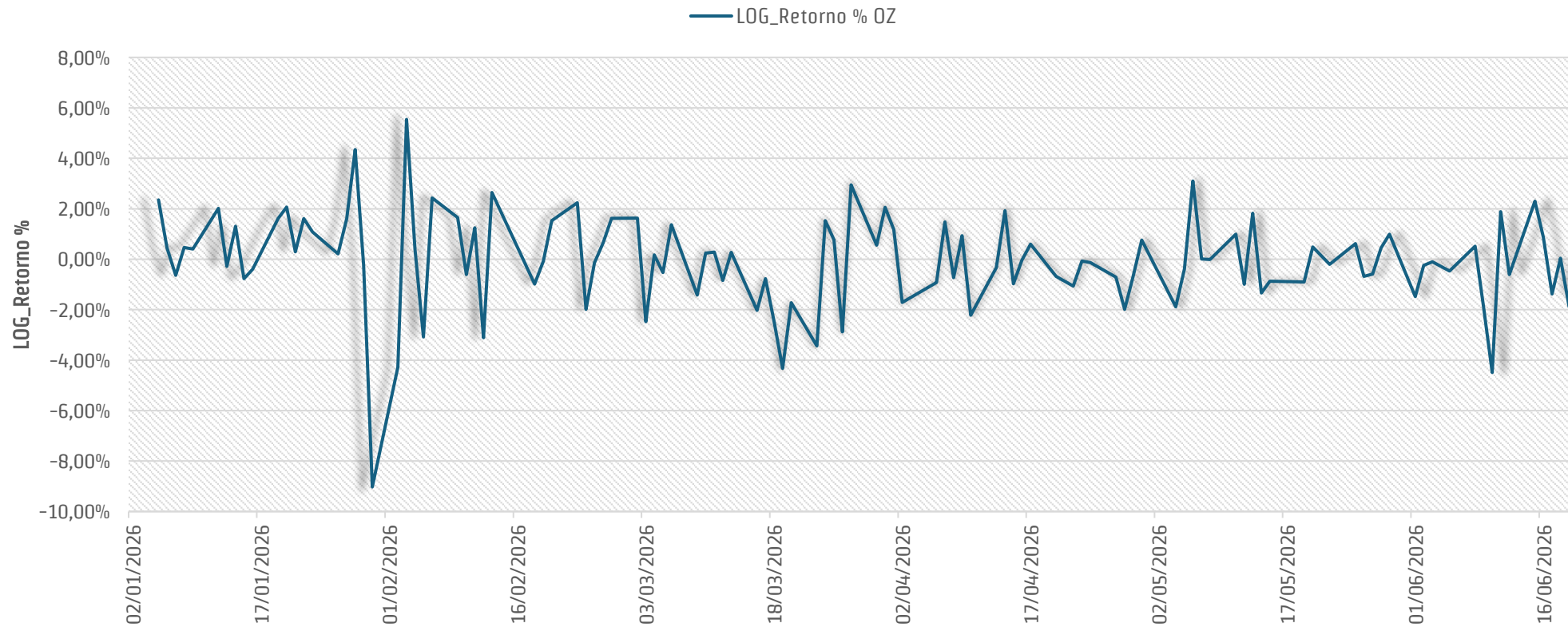
Volatilidade = Moeda

Tratado = Moeda

MAR 40 $\neq$ MAR 21

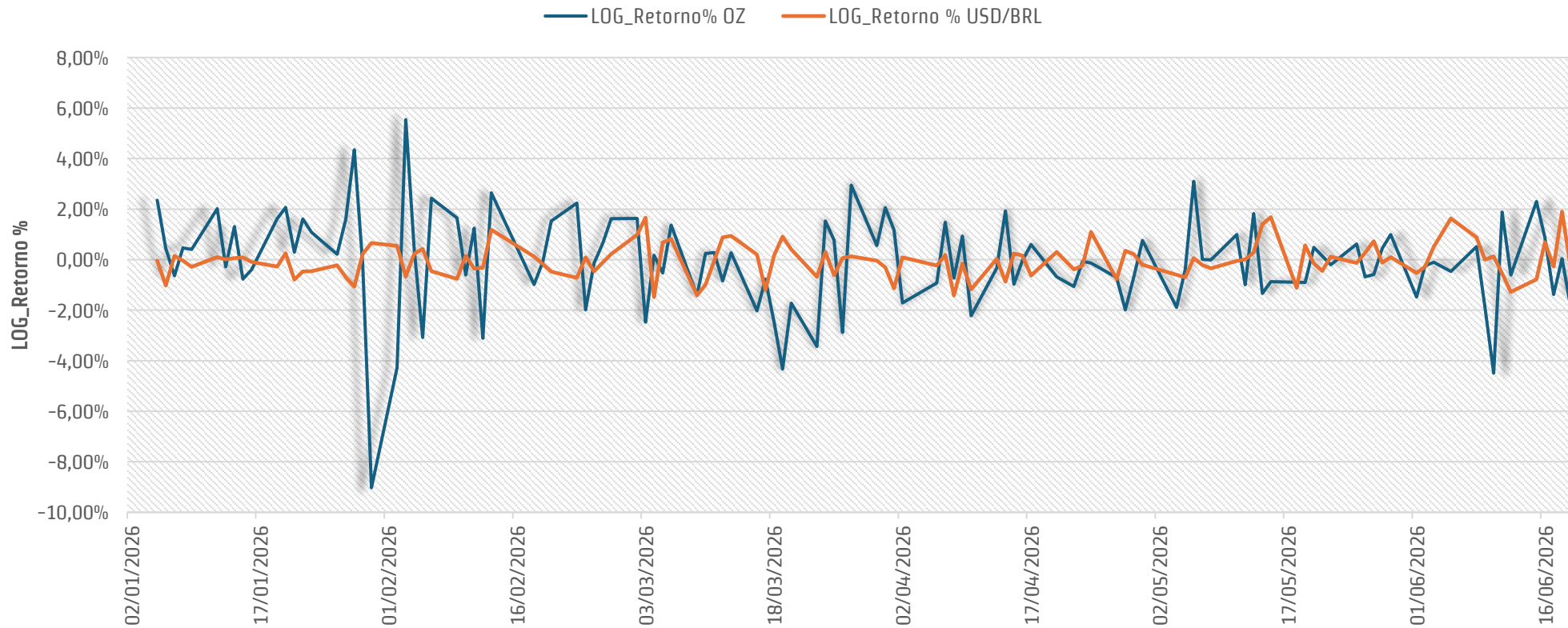
Ouro OZ

Fonte 1: Bullion Rates BR



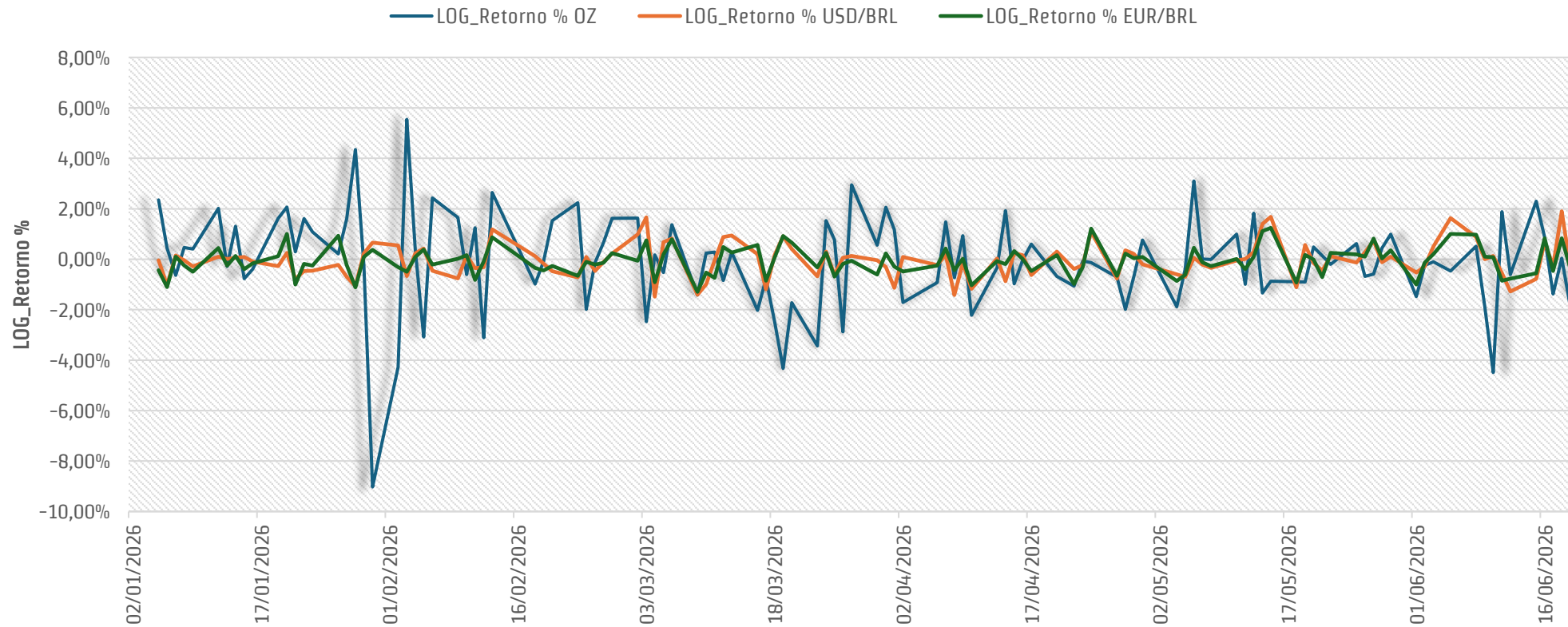
Ouro OZ | USD/BRL

Fonte 1: Bullion Rates BR
Fonte 2: Banco Central BR



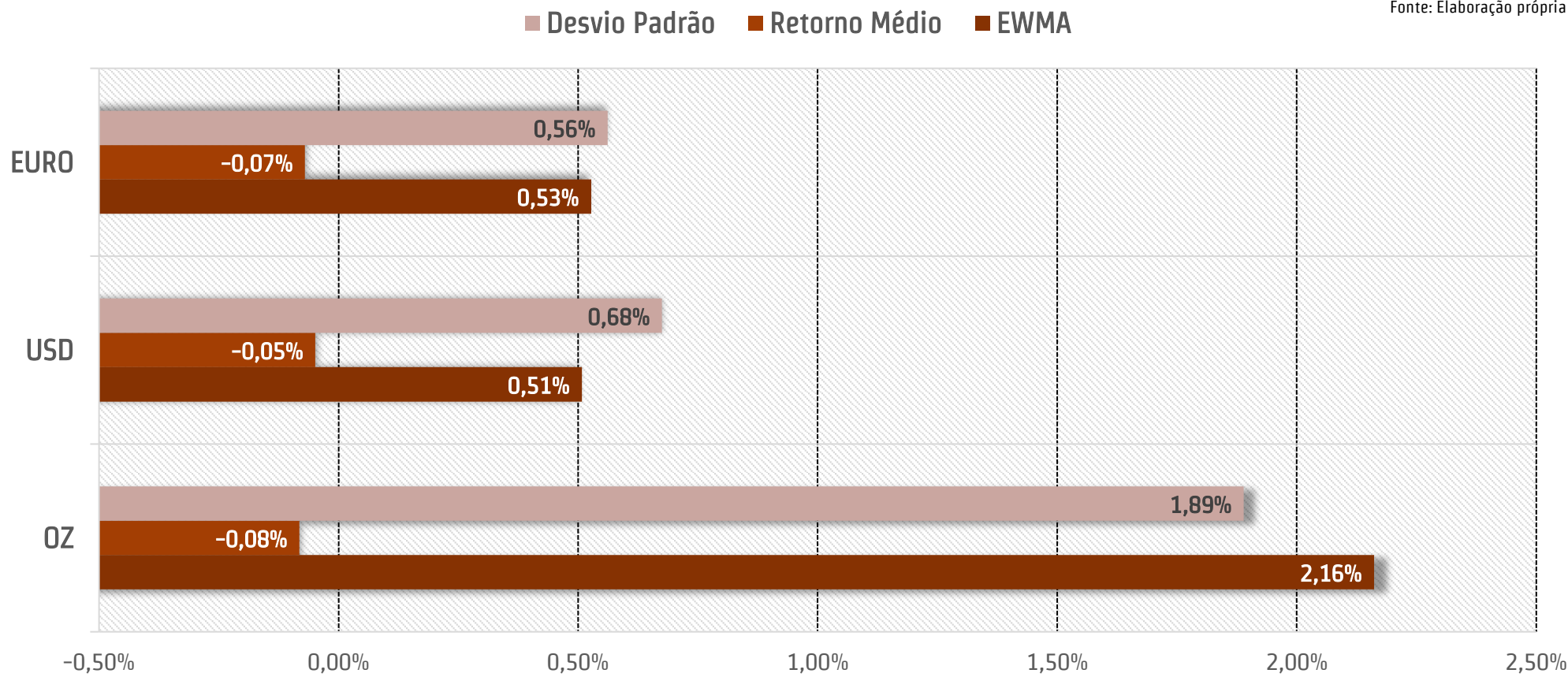
Ouro OZ | USD/BRL | EUR/BRL

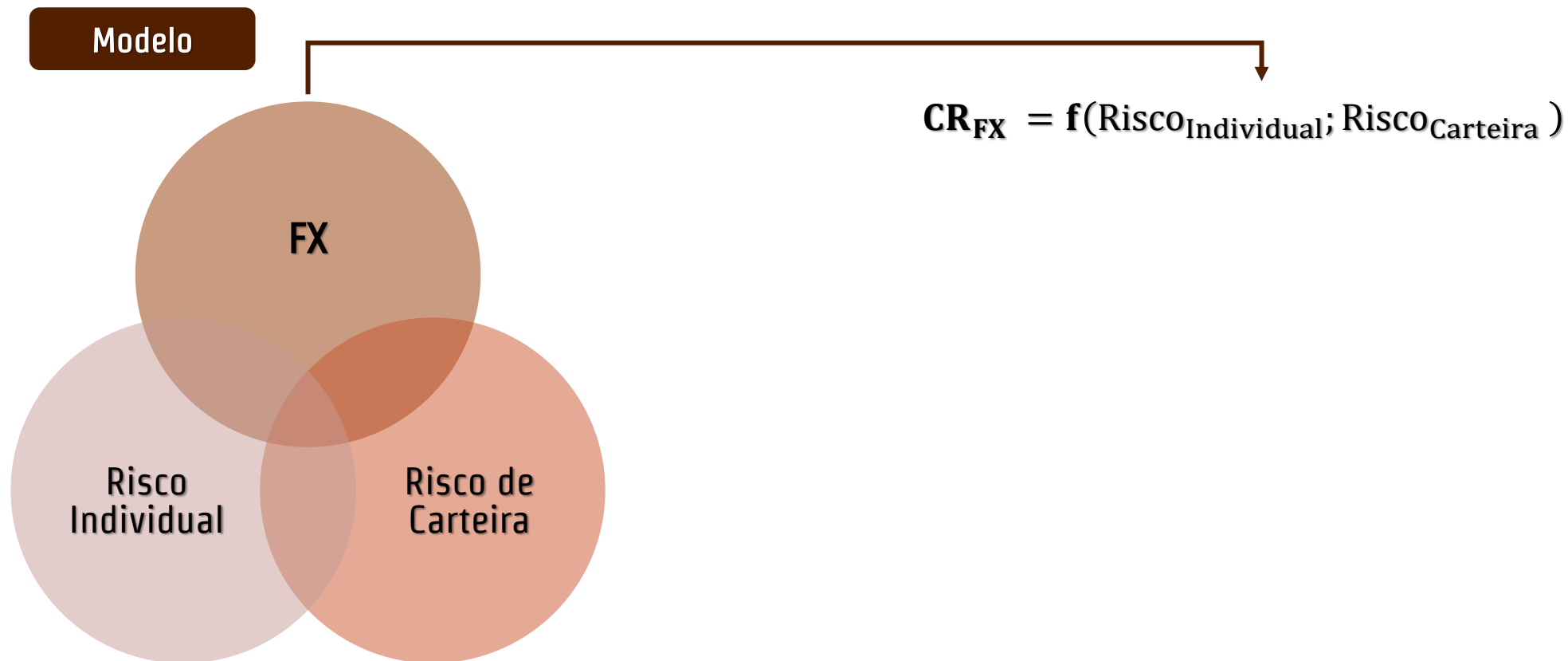
Fonte 1: Bullion Rates BR
Fonte 2: Banco Central BR

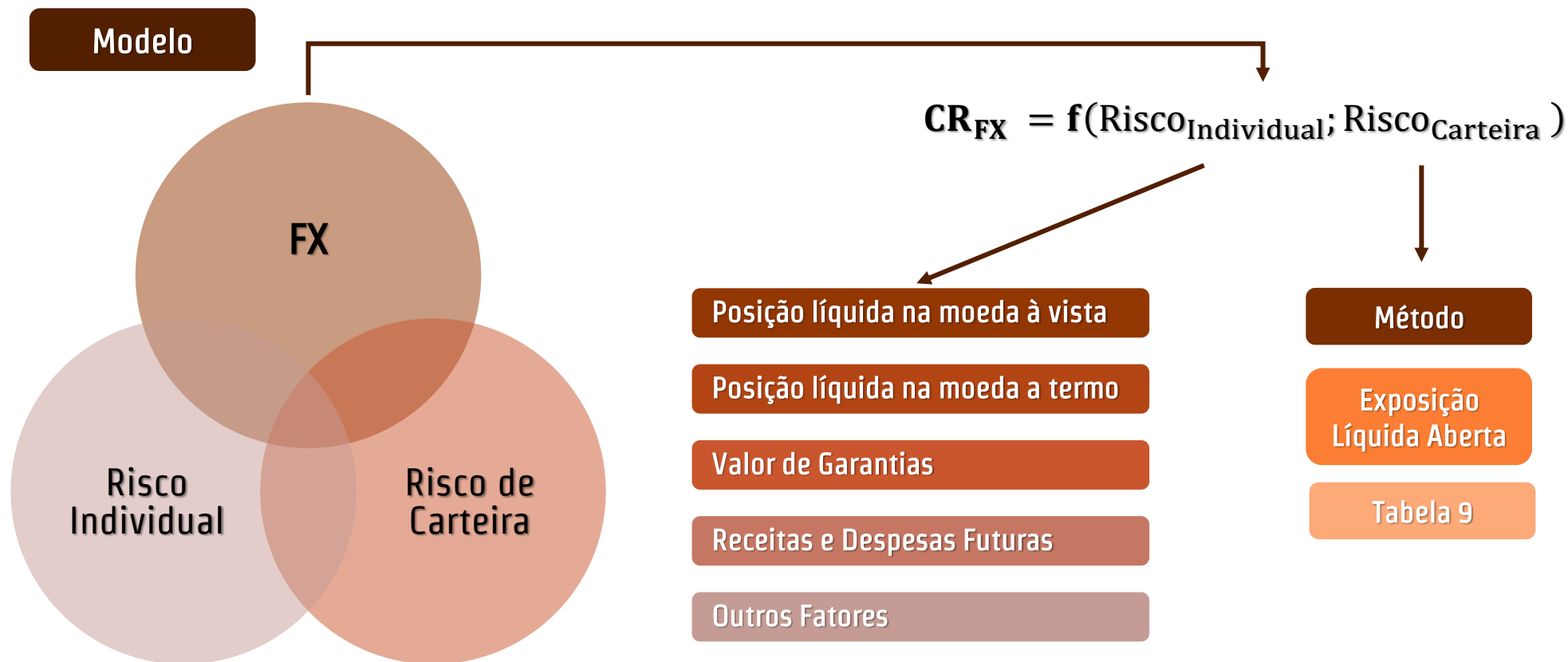


Basel MAR 40 – CR_{FX} – Abrangência

Fonte: Elaboração própria







Basel MAR 40 – CR_{FX} – Exposição Líquida Aberta



Example of the shorthand measure of FX risk						Table 9
	JPY	EUR	GBP	CAD	USD	Gold
Net position per currency	50	100	150	-20	-180	-35
Net open position	300			-200		35

Basel MAR 40 – CR_{FX} – Exposição Líquida Aberta



Example of the shorthand measure of FX risk						Table 9
	JPY	EUR	GBP	CAD	USD	Gold
Net position per currency	50	100	150	-20	-180	-35
Net open position	300			-200		35



$$CR_{FX} = \text{Máximo}_{\text{Exposições}} (\text{ABS}(\text{Exposições C}); \text{ABS}(\text{Exposições V})) + \text{ABS}(\text{Exposições Ouro})$$

Basel MAR 40 – CR_{FX} – Exposição Líquida Aberta



Example of the shorthand measure of FX risk						Table 9
	JPY	EUR	GBP	CAD	USD	Gold
Net position per currency	50	100	150	-20	-180	-35
Net open position	300			-200		35

Isonção

EB (T) < = PR

EL (T) < = 2%

PR | CAP. 10.1

$$CR_{FX} = \text{Máximo}_{\text{Exposições}} (\text{ABS}(\text{Exposições C}); \text{ABS}(\text{Exposições V})) + \text{ABS}(\text{Exposições Ouro})$$

CR_{COMM}



Mercadorias

- Mercado Secundário
- Metais Preciosos



Metais Preciosos

- Exceto Ouro



Instrumentos de alta volatilidade



Modelo

Abordagem
Simplificada

Escala de
Maturidade

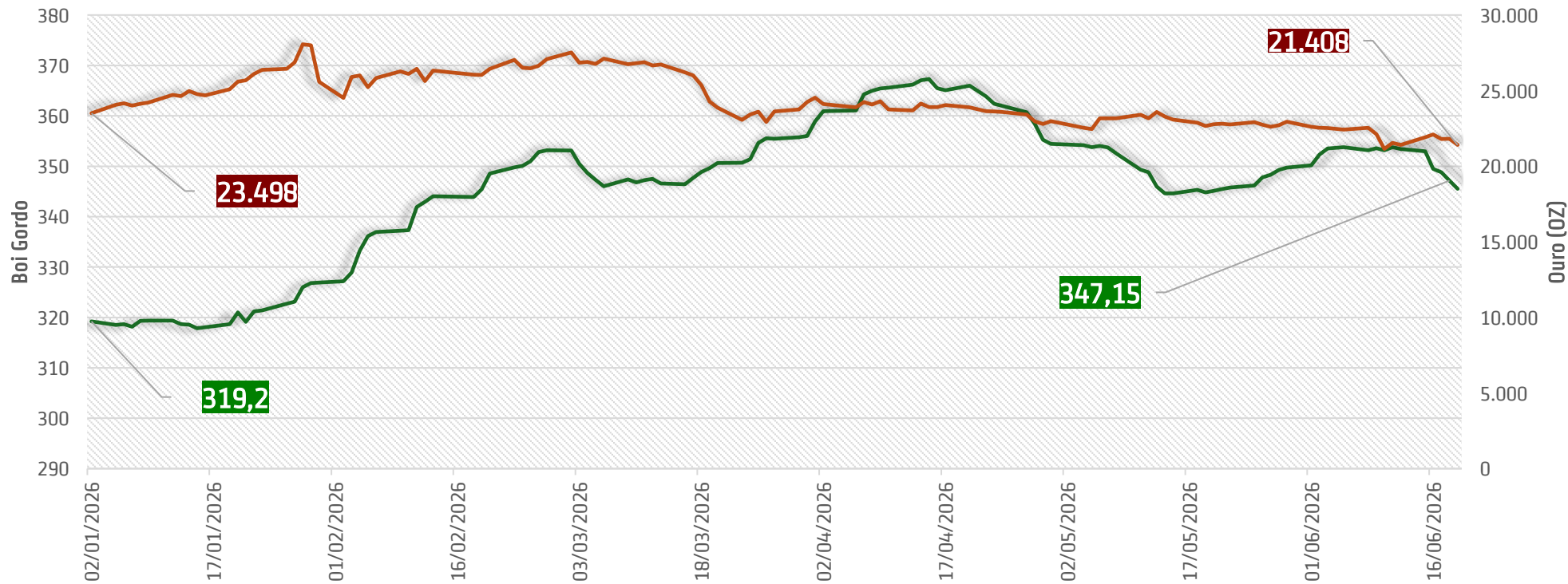
Basel MAR 40 – CR_{COMM} – Análise Empírica



Histórico de Cotações

Fonte 1: Cepea/ESALQ
Fonte 2: Banco Central BR

Boi Gordo BRL Ouro (preço/oz)



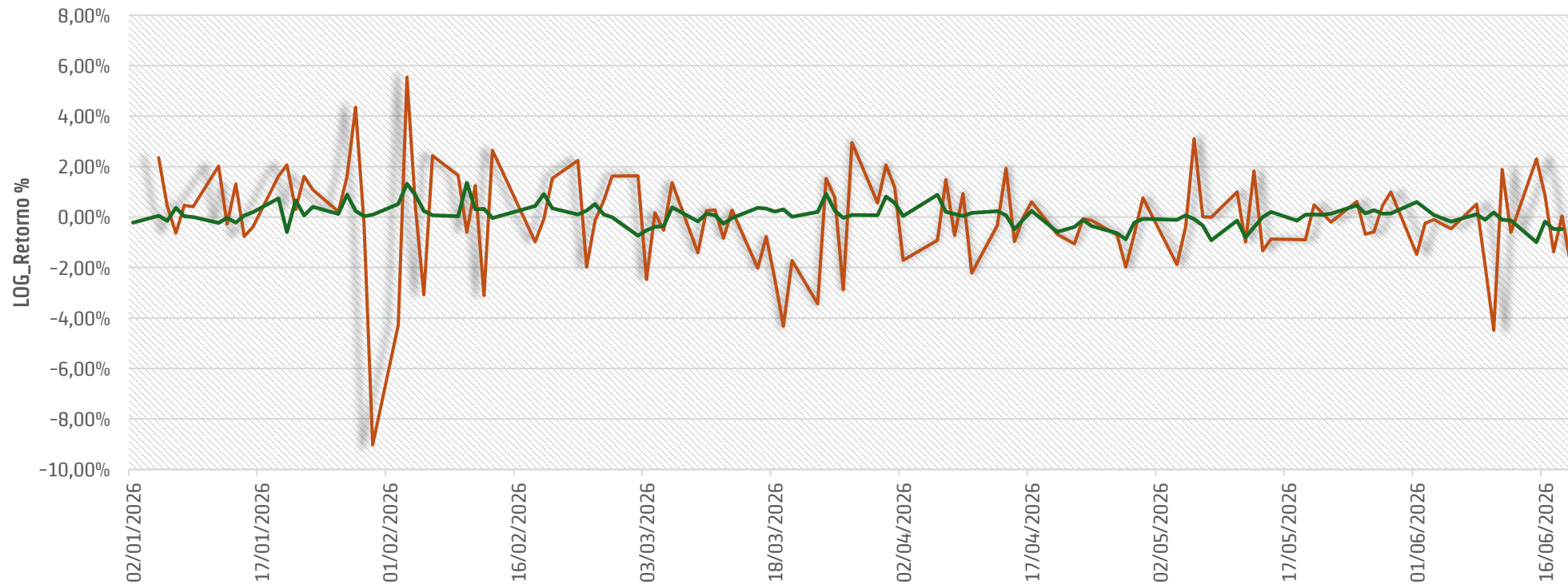
Basel MAR 40 – CR_{COMM} – Análise Empírica



Boi Gordo | Ouro OZ

Fonte 1: Cepea/ESALQ
Fonte 2: Banco Central BR

— LOG_Retorno % OZ1 — LOG_Retorno % Boi Gordo

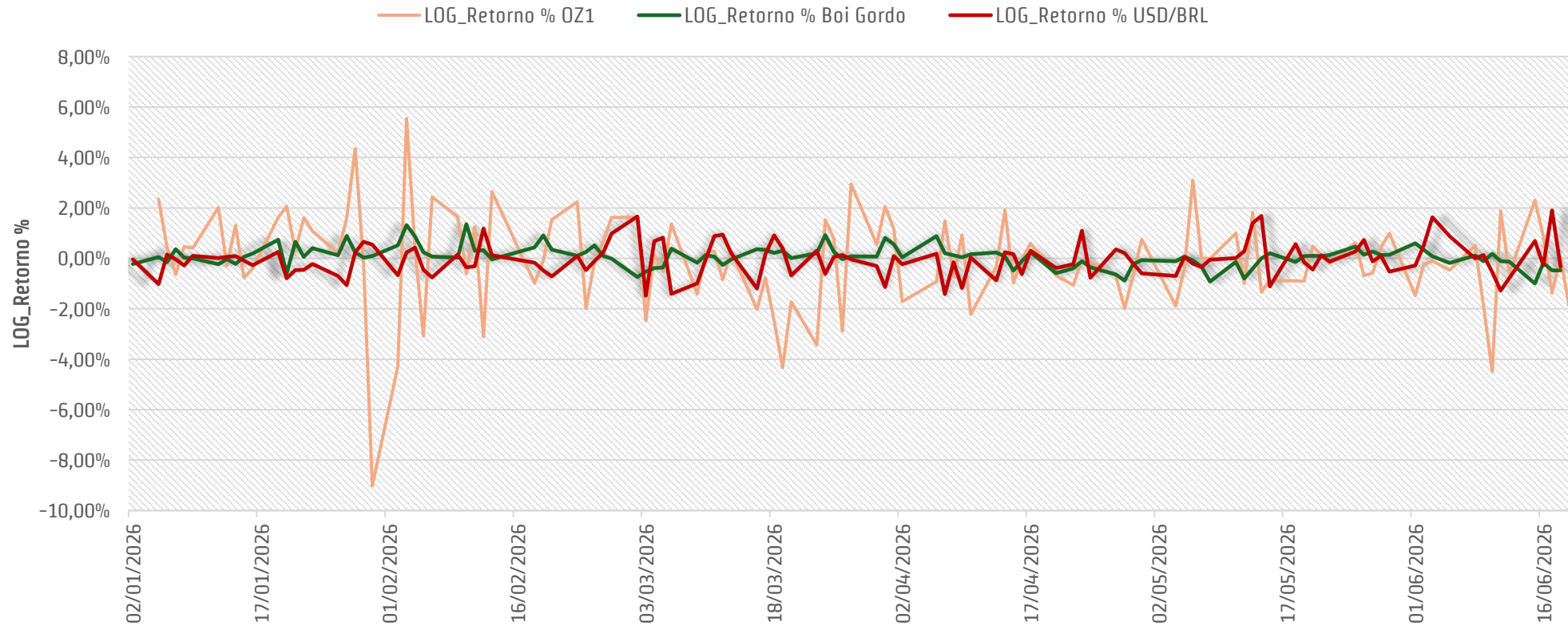


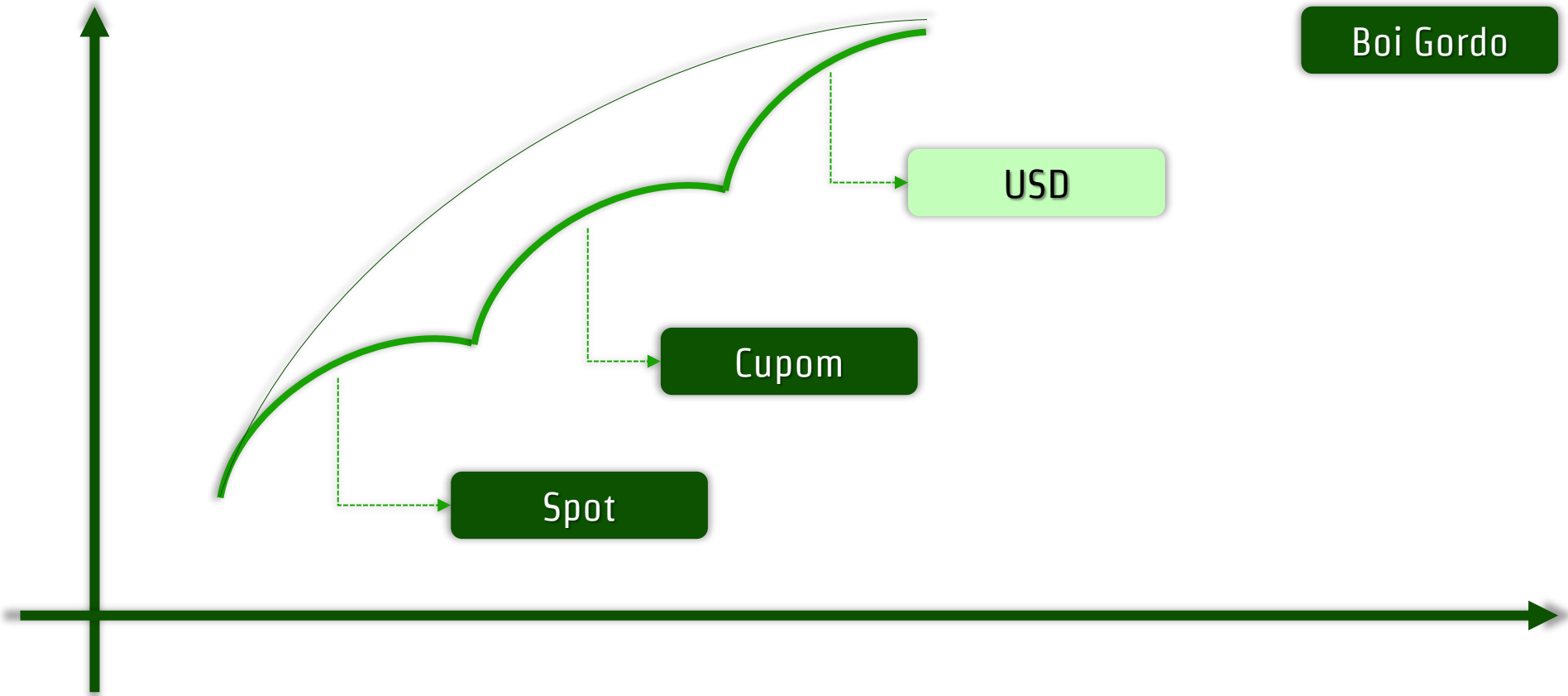
Basel MAR 40 – CR_{COMM} – Análise Empírica



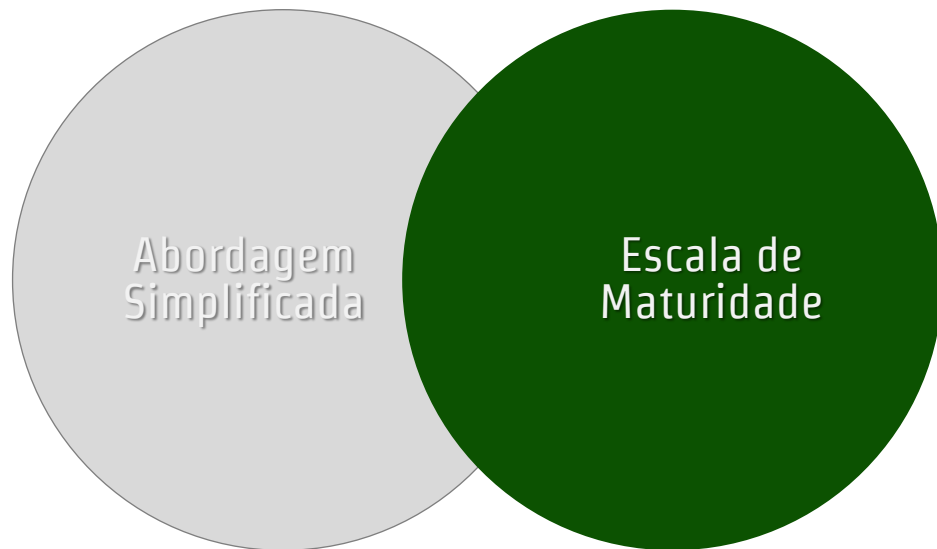
Boi Gordo | Ouro OZ | USD/BRL

Fonte 1: Cepea/ESALQ
Fonte 2: Banco Central BR





Modelo



Diretrizes Gerais e Sugestões (BIS)

Pretensão

- Captura do GAP da Carteira

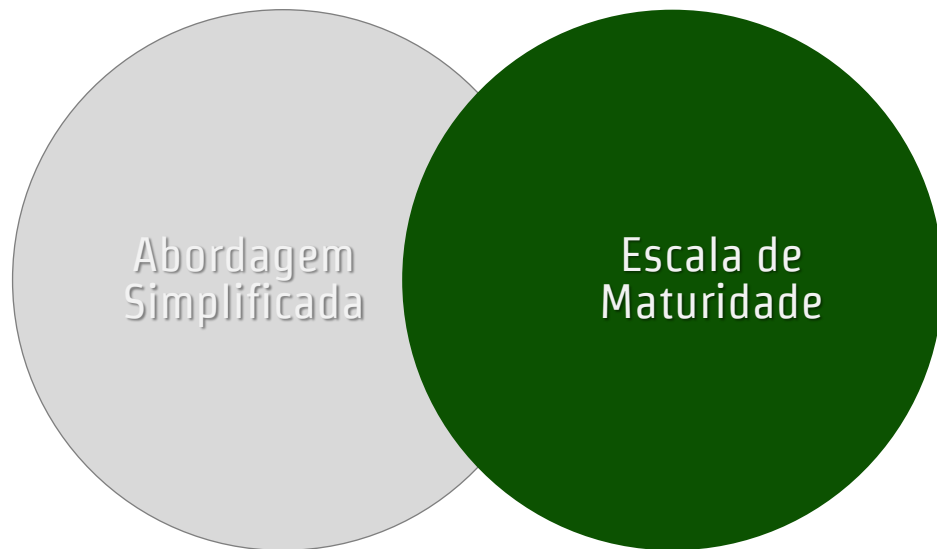
Sugere-se cálculo em termo líquidos

Termos de compensação

- Legislador Nacional

Conversão da cotação em moeda nacional

Modelo



Metodologia

1
1º Passo

- Cálculo das posições líquidas (BRL)

2
2º Passo

- Repartição em vértices
- TABELA 010

Metodologia

1
1º Passo

- Cálculo das posições líquidas (BRL)

2
2º Passo

- Repartição em vértices
- TABELA 010

Time bands and spread rates		Table 10
Time band	Spread rate	
0-1 month	1.5%	
1-3 months	1.5%	
3-6 months	1.5%	
6-12 months	1.5%	
1-2 years	1.5%	
2-3 years	1.5%	
over 3 years	1.5%	

Etapas de Cálculo

Apurar: Exposições líquidas

Multiplicar: 1,015 (Faixa)

Compensar: entre faixas

Acrescentar 0,60%

Requerimento: 15%

F''' e FIV

Modelo

Metodologia

Abordagem
Simplificada

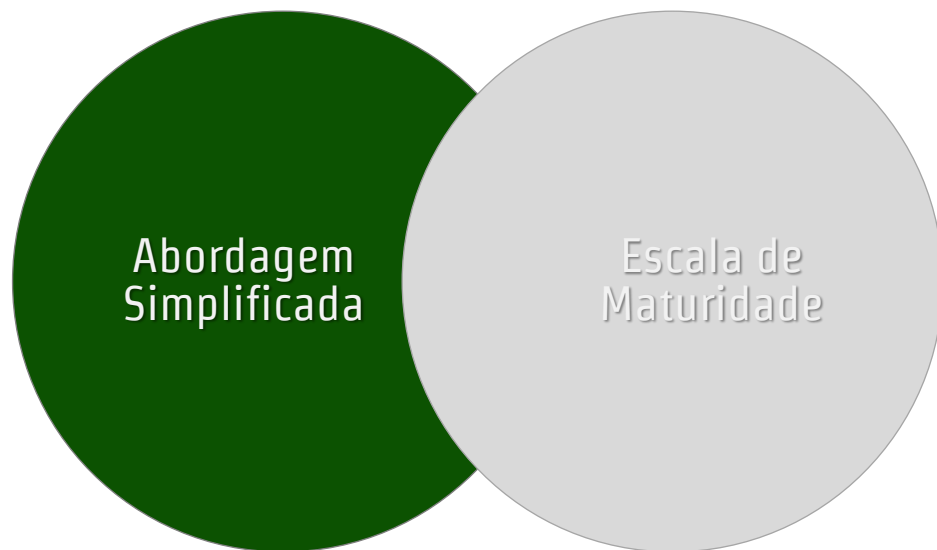
Escala de
Maturidade

Etapas de Cálculo

Exposições Líquidas: 15%

Exposições Brutas: + 3%

Modelo



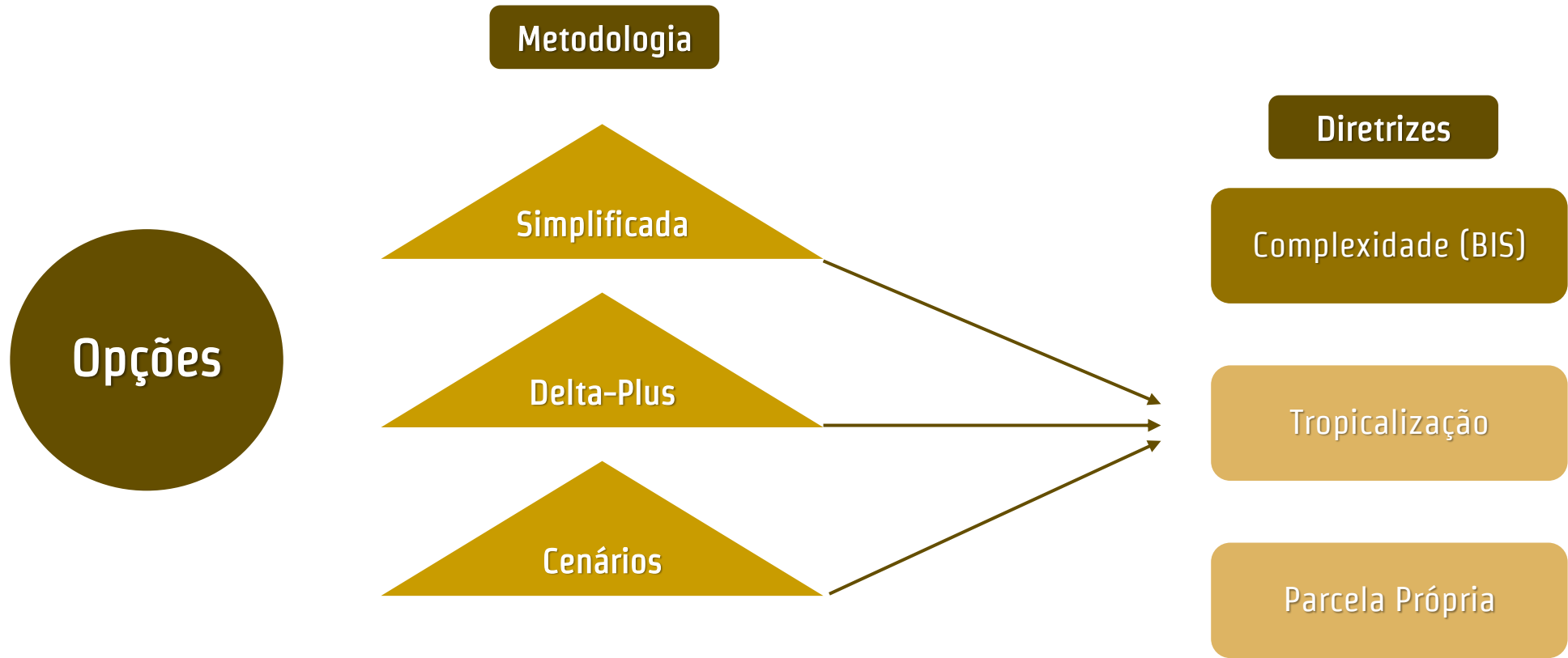
Metodologia

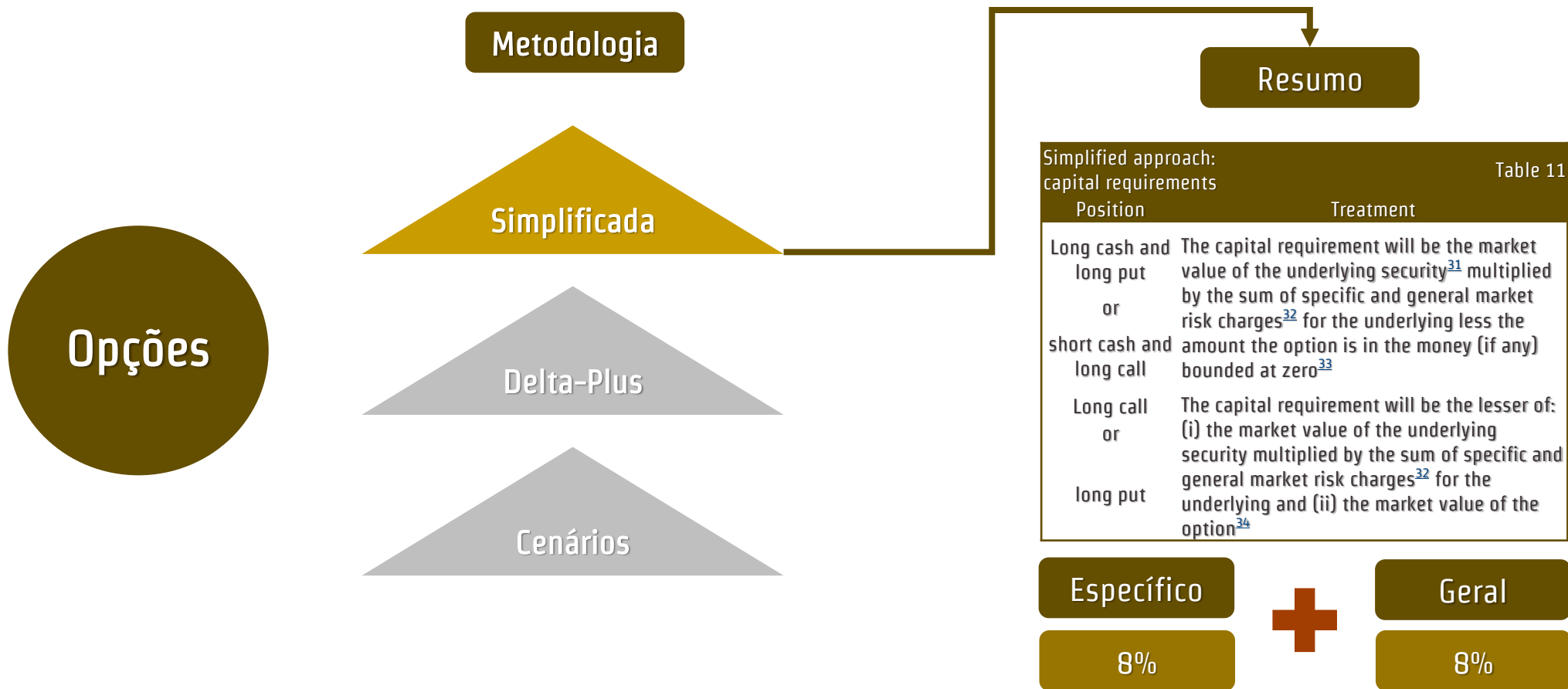
Etapas de Cálculo

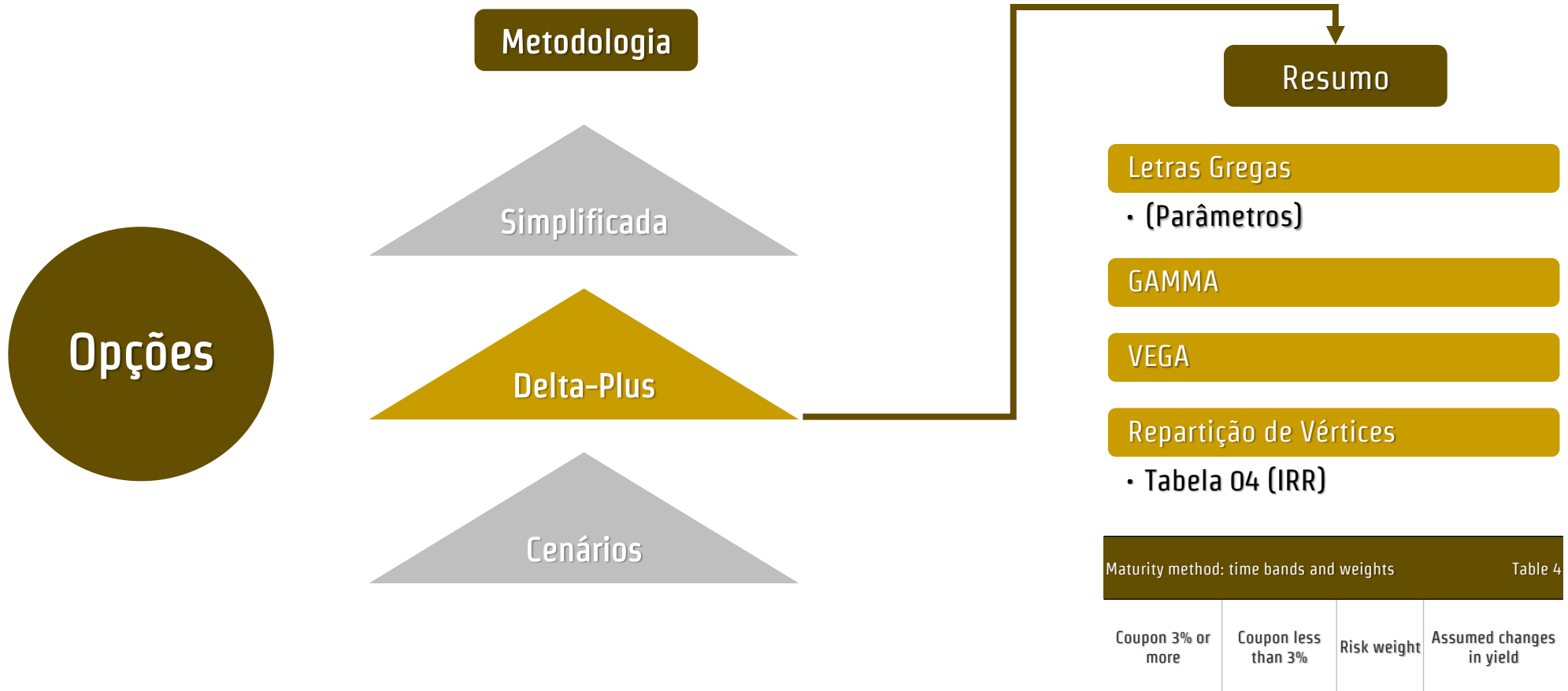
Exposições Líquidas: 15%

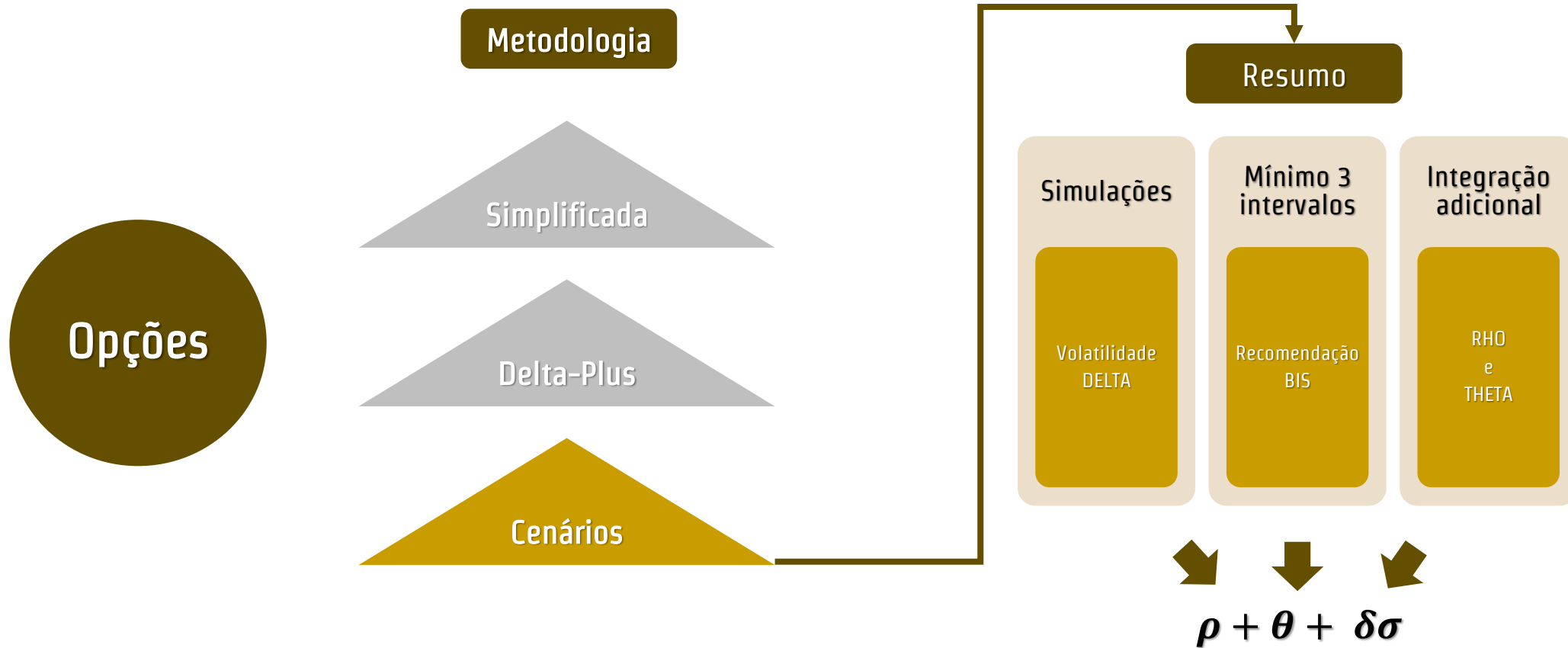
Exposições Brutas: 3%

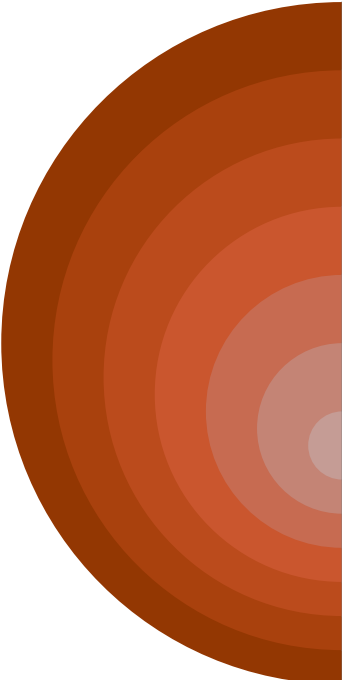
$$RWA_{COM} = \frac{1}{F} \cdot \left[\left(F''' \cdot \sum_{i=1}^n |EL_i| \right) + (F^{IV} \cdot EB) \right]$$











Semelhante ao MPAD atual
Fator SF = Sensibilidade = RWASENS
Risco Específico + Risco de Mercado
2 Metodologias: IRR
2 Metodologias: COMM
Ouro = Moeda $\neq$ RWASENS
Componente Específica: Opções

4º Workshop Duxus de Risco

Notas de Risco.

Obrigado!

Fábio Henrique Costa Corrêa

Rodrigo Leme de Oliveira

