

# RISK MANAGEMENT GENERALITAT VALENCIANA

**Valencia, May 2010**



# RISK MANAGEMENT GENERALITAT VALENCIANA

## WHAT have the theoretical economists been saying about debt management?

- TOBIN (1963): Economic stabilization. Focus on long term bonds in order to slowdown the Economy.
- BARRO (1999): To minimize the variability of the tax rates. GDP-link bonds or a combination of fixed, inflation-link and foreign debt.
- MISSALE (1999): To stabilize the ratio deficit/GDP. The optimal portfolio will depend on the correlations among GDP growth, interest rates and inflation.

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**WHAT have the national treasuries been doing in risk management in the last years?**

COUNTRIES	BODY	TARGET	BENCHMARK	BENCHMARK OBJECTIVE	RISK MEASURE	OTHER RISKS
SWEDEN	SNDO	Long Term Low Cost	Foreign: 15% Inflation link: 25% Refixings: 3,1Y	To stabilize Debt/GDP	VAR Cash-flow-risk	N/A
HOLLAND	DSTA	To minimize debt cost subject to a risk limit	N/A	N/A	Amount at risk 9%	N/A
DENMARK	DNB (Bco. Central)	To minimize debt cost (10Y)subject to a risk limit	N/A	N/A	Cash flow at risk simulations	Credit, operative
N.ZEALAND	NZDMO	Id	Strategic portfolio	---	VAR	Credit, operative, liquidity, refinancing
PORTUGAL	IGCP	Id	Strategic portfolio	---	Cash flow risk simulation (5Y)	Refinancing, credit
IRELAND	NTMA	To minimize debt cost subject to a risk limit	Strategic portfolio	To stabilize Debt/GDP	VAR	Refinancing, operative
FINLAND		To minimize debt cost subject to a risk limit	Strategic portfolio	---	---	---
BELGIUM	BELGIC AGENCY		Refinancing or Refixing: 1Y: 22.5% 5Y: 60%		Budget at risk	Credit, refinancing

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## VALENCIA'S DEBT AND RISK MANAGEMENT

- Management through a special agency – IVF.
- The funding and the risk are managed separately by different people and with different indicators.
- The funding through international markets.
- Internal committee to make the decisions about risk management.



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## RISK MANAGEMENT TARGETS

- Yearly interest cost must not exceed the amount included in the budget.
- Accrual interest cost rate has to be equal or less than potential nominal GDP growth, in order to support the sustainability.
- Real portfolio cost must outperform benchmark portfolio cost in NPV plus net interest payments.

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## WHAT IS THE BENCHMARK?

- The benchmark portfolio is the portfolio which minimizes the variability of the cyclical deficit in the long term. It means that we would like to pay more in the economy upturn and less otherwise.
- It's a combination of fix and floating notes of a 5 year average life.
- CCAA Panel data to obtain the elasticity between cyclical primary deficit and operative revenues. Budget Sensitivity to monetary interest rates.



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## CCAA PANEL DATA RESULTS

```
. xtreg defpib varpib dforal dsanidad deduca d92 d98 d02 ds2000,i(ica) re
```

```
Random-effects GLS regression                Number of obs   =    238
Group variable (i) : ica                    Number of groups =    17

R-sq:  within = 0.1265                      Obs per group:  min =    14
        between = 0.4068                      avg   =   14.0
        overall = 0.1866                      max   =    14
```

```
Random effects u_i ~ Gaussian                Wald chi2(8)    =   39.79
corr(u_i, X) = 0 (assumed)                  Prob > chi2    =   0.0000
```

defpib	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
varpib	-.1053293	.0307651	-3.424	0.001	-.1656278	-.0450309
dforal	-.4907538	.34757	-1.412	0.158	-1.171978	.1904708
dsanidad	.0834608	.1852294	0.451	0.652	-.2795822	.4465038
deduca	.5323879	.1925422	2.765	0.006	.1550121	.9097638
d92	.1776948	.3308582	0.537	0.591	-.4707754	.8261651
d98	.0960181	.3390415	0.283	0.777	-.568491	.7605273
d02	-.0232567	.3338403	-0.070	0.944	-.6775716	.6310581
ds2000	-.3158303	.1461106	-2.162	0.031	-.6022018	-.0294589
_cons	.4506896	.3564664	1.264	0.206	-.2479718	1.149351
sigma_u	.19712257					
sigma_e	.48902073					
rho	.1397752 (fraction of variance due to u_i)					

```
. xthaus
```

Hausman specification test

---- Coefficients ----			
defpib	Fixed Effects	Random Effects	Difference
varpib	-.1067788	-.1053293	-.0014494
dsanidad	.0713284	.0834608	-.0121324
deduca	.5344998	.5323879	.0021119
d92	.1662993	.1776948	-.0113956
d98	.0864431	.0960181	-.009575
d02	-.025622	-.0232567	-.0023653
ds2000	-.3181121	-.3158303	-.0022818

Test: Ho: difference in coefficients not systematic

```
chi2( 7) = (b-B)'[S^(-1)](b-B), S = (S_fe - S_re)
      = 0.09
Prob>chi2 = 1.0000
```

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$$\frac{FLOATINGDEBT}{GDP} = \frac{\sigma_{\frac{deficit}{GDP}} * \rho_{\dot{GDP}, r}}{\sigma_r}$$

$$\sigma_{\frac{deficit}{GDP}} = \varepsilon_{\frac{deficit}{GDP}, \dot{GDP}} * \sigma_{\dot{GDP}}$$

$\sigma_{\frac{deficit}{GDP}}$  = Standard deviation deficit/GDP.

$\sigma_{\dot{GDP}}$  = Standard deviation GDP growth.

$\sigma_r$  = Standard deviation Eonia Rate.

$\rho_{\dot{GDP}, r}$  = correlation GDP growth and Eonia Rate.

$\varepsilon_{\frac{deficit}{GDP}, \dot{GDP}}$  = Elasticity deficit/GDP and GDP growth

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## REAL PORTOFOLIO AGAINST THE BENCHMARK

- Maximum risk limit: Higher 20% interest expenses forecast in the budget and 20% and operating balance average in the last 5 years.
- Risk Measure: The risk is the difference between real portfolio and the benchmark valued in terms or Value-at-Risk (VAR) with 95% and three months time.
- Restrictions: No exchange rate risk, in general.

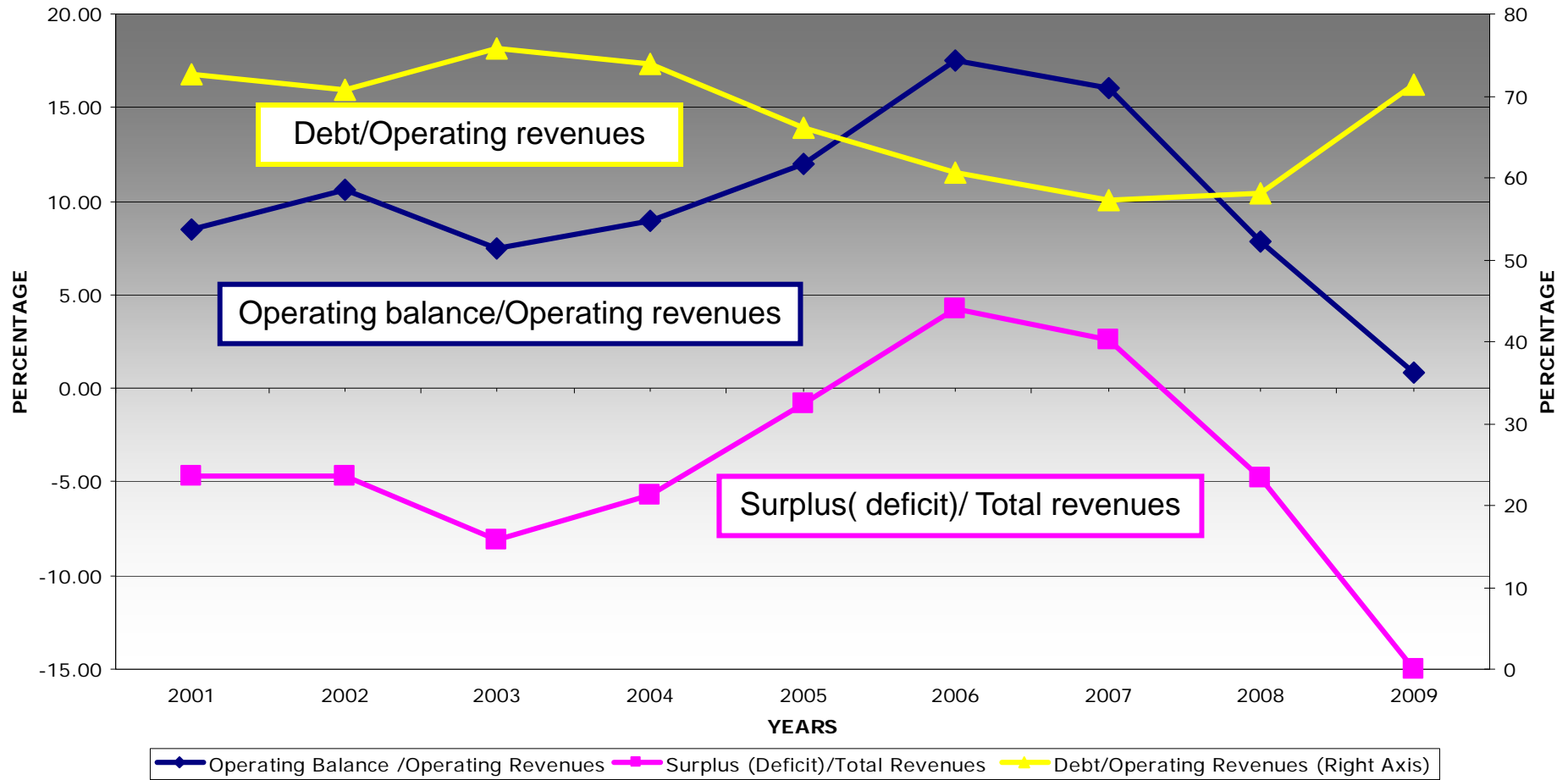
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## OPTIMIZATION

- Horizon time: three months. This is done every month.
- Number of scenarios: seven about interest rates.
- Target: to minimize cost with a certain risk.
- Restrictions: turn over (%) or level of risk.
- Optimization results: to increase or/and decrease some tenors in the yield curve
- Execution: through derivatives or/and new issues in capital markets.
- Daily results (difference between real portfolio and benchmark cost in NPV) and monthly reports.

# RISK MANAGEMENT GENERALITAT VALENCIANA

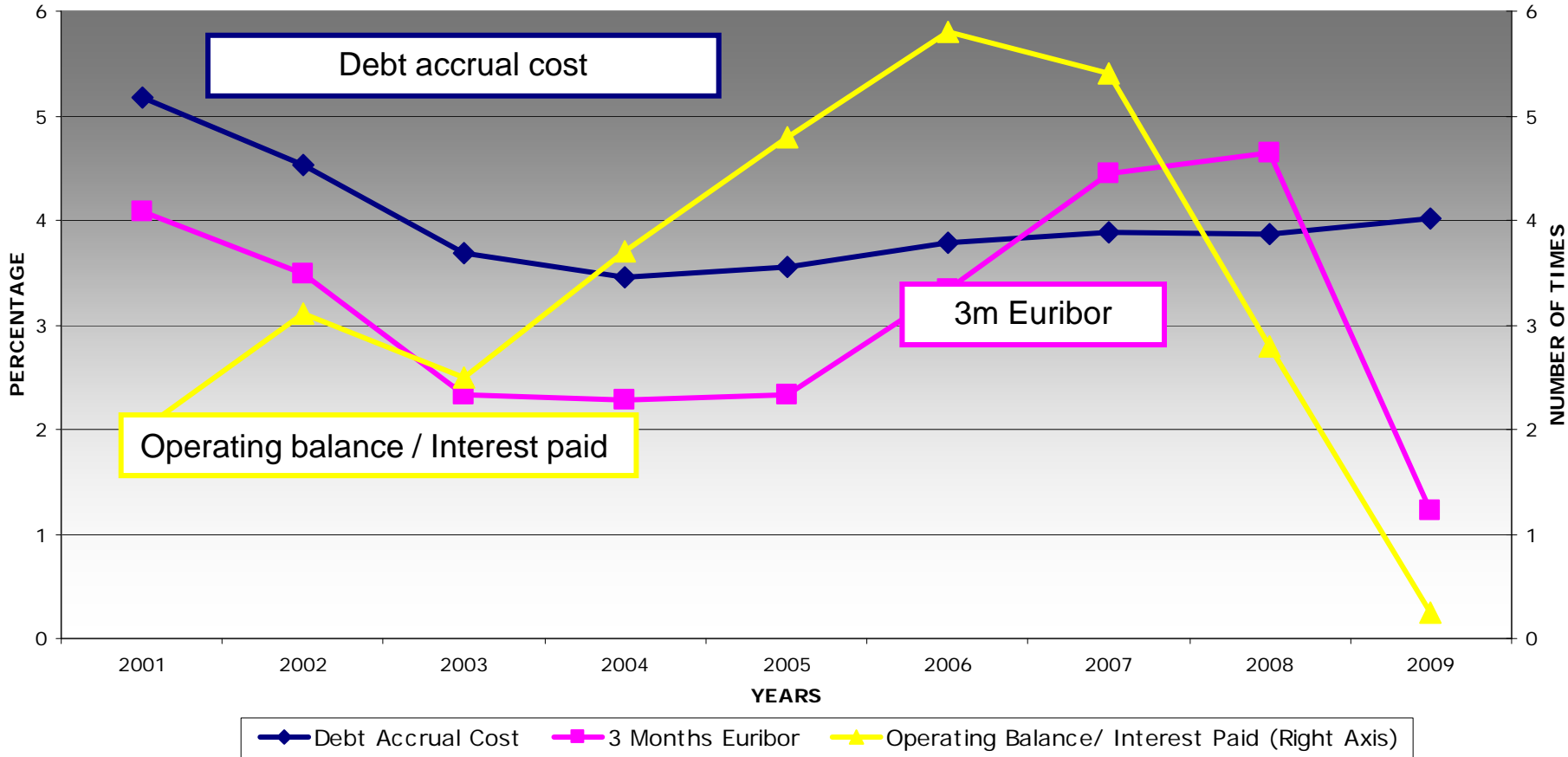
## BUDGET RATIOS



Source: Generalitat Valenciana

# RISK MANAGEMENT GENERALITAT VALENCIANA

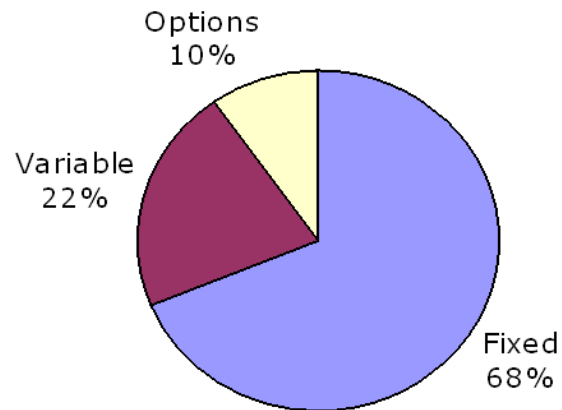
## BUDGET RATIOS (cont.)



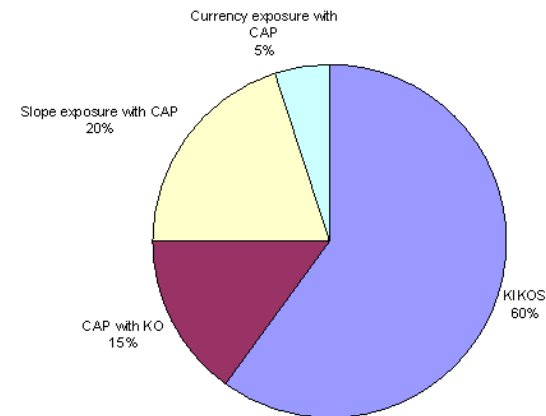
Source: Generalitat Valenciana

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**Fixed / Floating structure**  
**31/03/2010**

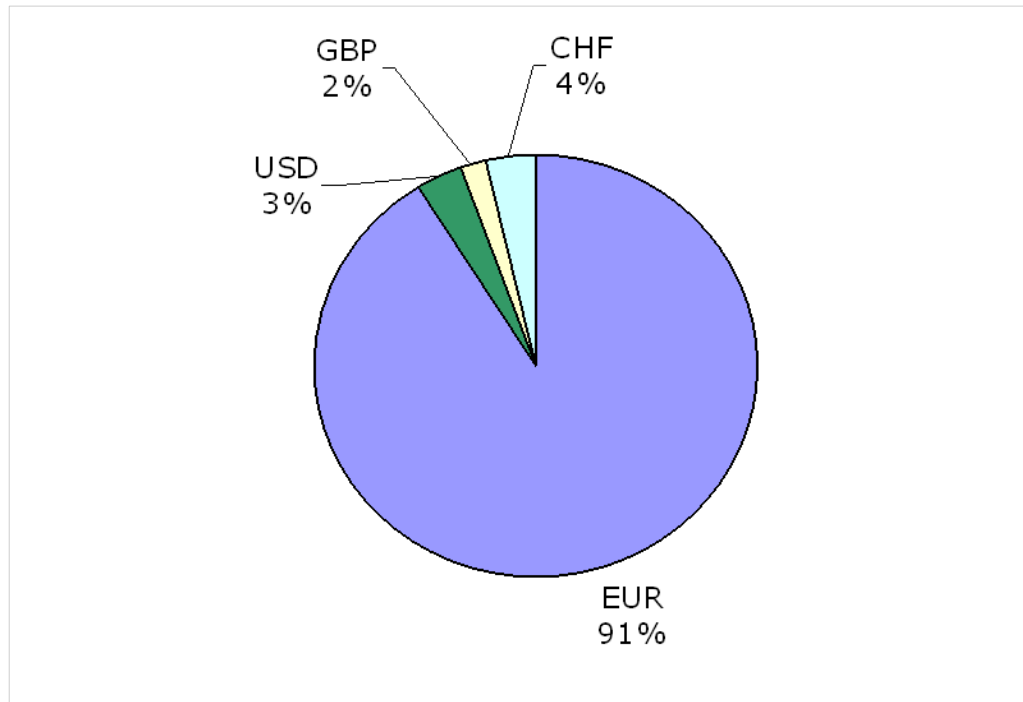


**Options Portofolio**  
**31/03/2010**



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**By currencies (before currency swaps):  
31/03/2010**

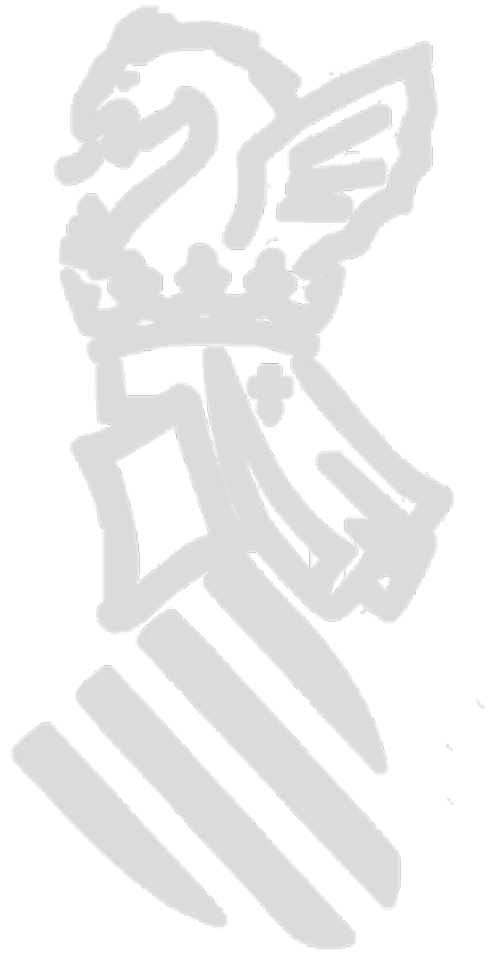


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## VALENCIA'S DEBT PERFORMANCES

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Accrual Debt Cost	5,20	5,19	5,18	4,53	3,68	3,45	3,56	3,79	3,88	3,86	4,03
Real Portfolio Debt Cost (NPV)	-0,05	5,42	6,08	5,97	3,15	5,14	3,53	-0,25	1,96	9,35	3,98
Benchmark Cost (NPV)	-0,12	5,62	6,20	6,94	3,58	5,04	3,71	0,62	2,54	8,39	3,36
Performance ( -=positive; +=nega	0,07	-0,20	-0,12	-0,97	-0,43	0,10	-0,18	-0,87	-0,58	0,96	0,62

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**Valencia, april 2010**