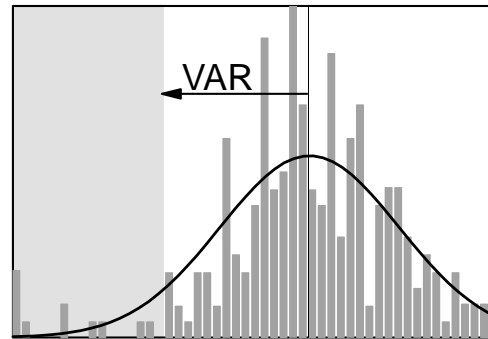


Risk in Financial Reporting



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2005

I. Information Set

(1) First moments:

e.g. balance sheet values

(2) Risk information (second moments):

e.g. VAR, stress tests

(3) Measurement error in variables (first and second moments)

Information Set: Practice

- (1) First moments: commonly used, albeit with disputes in measurement methods
- (2) Risk information: now reported by some firms, especially financials and derivatives users (SEC rule)
- (3) Measurement error in variables: rarely reported, except for backtesting

“En pratique, ça marche,
mais en théorie?”

(attributed to a French mathematician)

Information Set: Theory

(1) Report first moments:

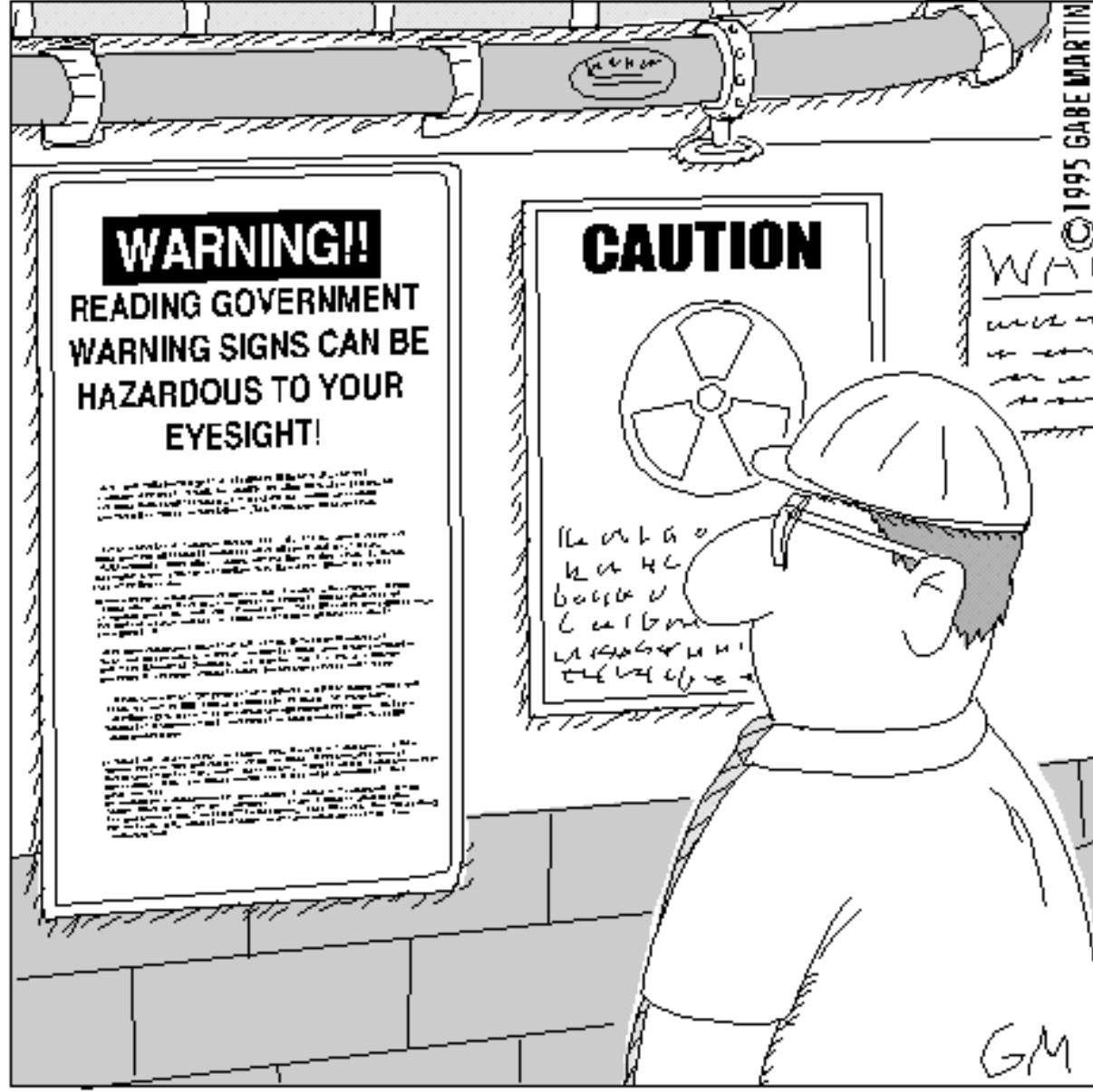
- » historical cost: backward-looking
- » market values: forward-looking

(2) Report risk information

(3) Report measurement error in variables (first and second moments)

- » model error (estimation error, noise)
- » reporting bias should be reported (maybe not, but then disclose conflicts of interest)





Disclosures of Market Risk: 1993-2002

Year	Total Examined	Total Provide	Percent Quant. Info.
2002	44	43	98%
2001	54	48	89%
2000	55	47	85%
1999	57	49	86%
1998	71	47	66%

		Disclose VAR Data	
1997	78	63	81%
1996	79	50	63%
1995	79	36	46%
1994	79	18	23%
1993	79	4	5%

Source: Basel Committee Surveys

Deutsche Bank: Economic and Regulatory Capital (in €millions)

Economic capital usage in € m.	2004	2003
Credit risk	5,971	7,363
Market risk	5,476	5,912
Trading market risk	1,581	972
Nontrading market risk	3,895	4,940
Diversification across credit, market risk	(870)	(1,152)
Sub-total credit and market risk	10,577	12,123
Business risk	381	1,117
Operational risk	2,243	2,282
Total economic capital usage	13,201	15,522

“Very severe” means a 0.02% probability that our aggregated losses within one year will exceed our economic capital for that year.

Regulatory Capital

	2004	2003
Risk-weighted positions	206,718	206,142
Market risk equivalent ¹	10,069	9,530
Risk position	216,787	215,672
Core capital (Tier I)	18,727	21,618
Supplementary capital (Tier II)	9,885	8,253
Available Tier III capital	—	—
Total regulatory capital	28,612	29,871
Core capital ratio (Tier I)	8.6%	10.0%
Capital ratio (Tier I + II + III)	13.2%	13.9%

Tier 1?

MEASURING VAR:

Comparison of Methods

- (1) Non-parametric: sample quantile $q(c)$
 - (2) Parametric: use the std. deviation σ in $q_s = \alpha\sigma$, assuming a normal distribution, or **other** (e.g. $\alpha(c)=1.645$ for $c=95\%$ and a normal distribution)
- Is any method superior to the other?
 - » the parametric approach is superior if the underlying assumptions are correct
 - » the efficiency gain stems from the additional information

ASSESSING VAR:

Estimation Error in Quantiles

- Method 1: the c -th sample quantile $q(c)$

» asymptotic std err is

$$se(\hat{q}) = \sqrt{\frac{c(1-c)}{T f(q)^2}}$$

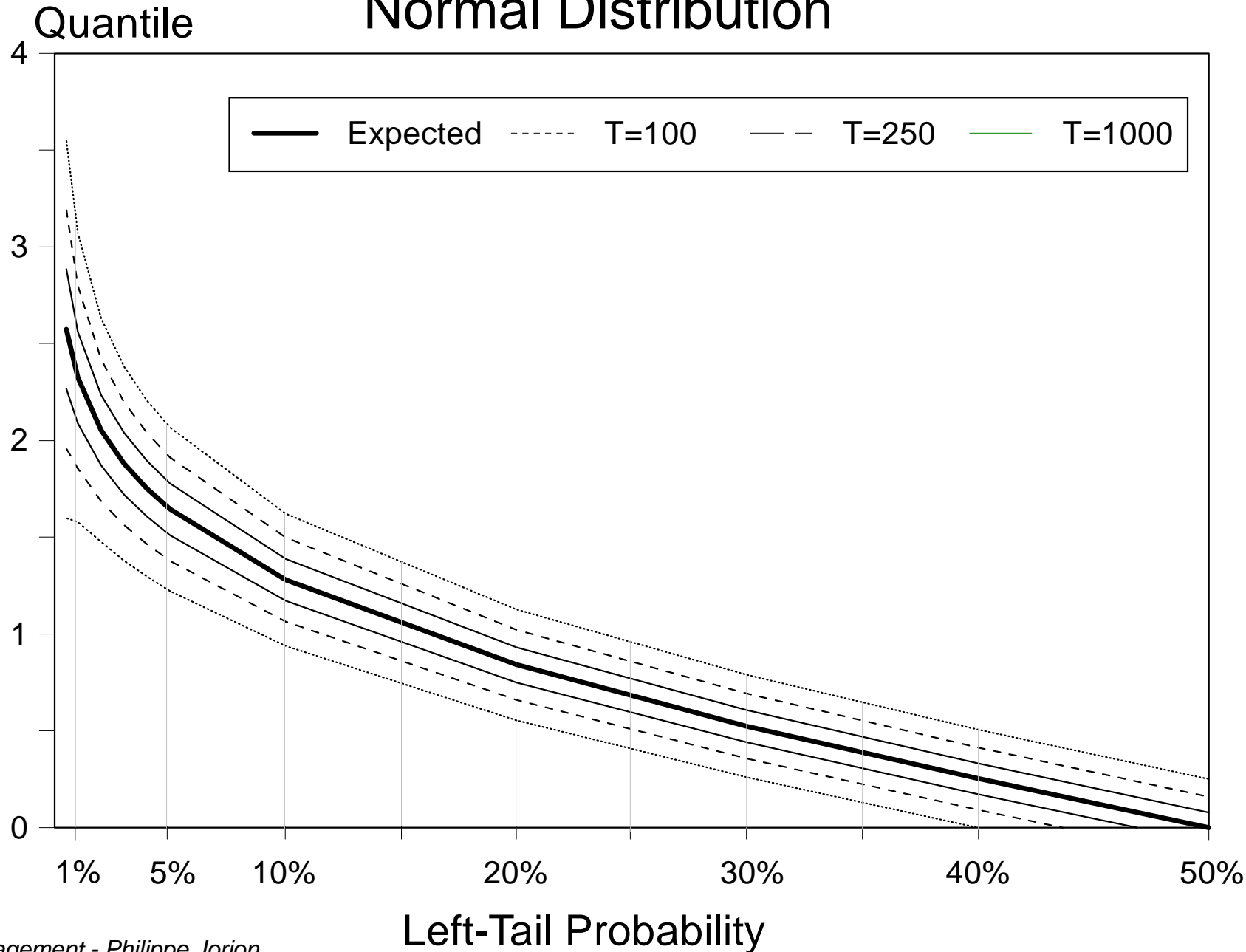
- Method 2: the quantile is measured as $q_s = \alpha \hat{\sigma}$

» asymptotic std err is

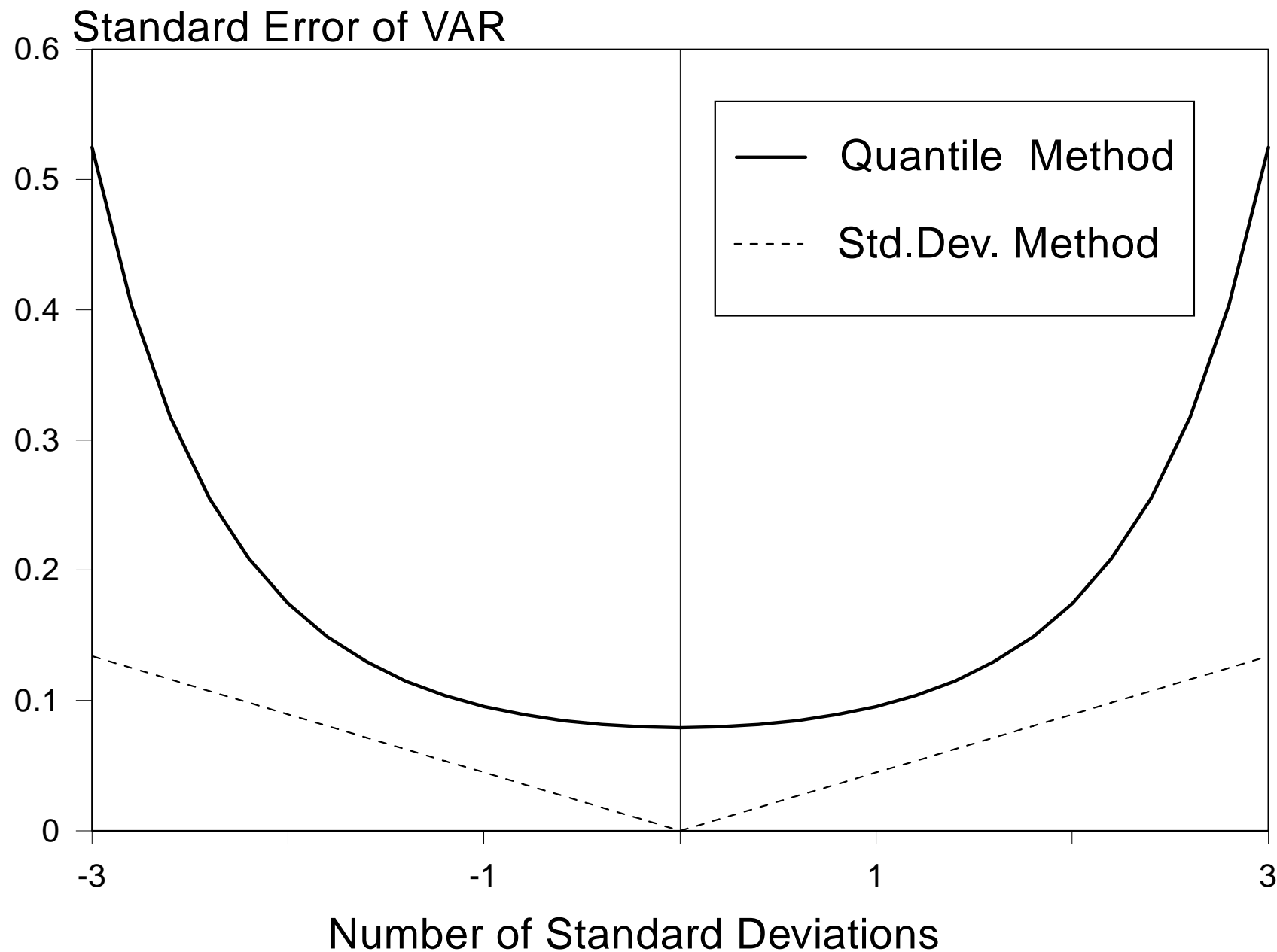
$$se(\alpha \hat{\sigma}) = \alpha \sigma \sqrt{\frac{1}{2T}}$$

- Method 2 is more precise because the standard deviation uses data from the entire distribution, not just adjoining points

Confidence Bands for Sample Quantile Normal Distribution



Standard Error of VAR for Different Methods



The Effect of Sample Size on Standard Errors

		Standard Error Replications:			
Left Tail	Expected Quantile	100	500	1000	10,000
1%	-2.326	0.409	0.170	0.119	0.037
5%	-1.645	0.216	0.092	0.066	0.021
10%	-1.282	0.170	0.075	0.052	0.017
Std.Dev.	1.000	0.069	0.032	0.022	0.007

Relative Precision for 99% VAR

		Relative Error (Percent)			
		Replications:			
Distribution	Skewness	100	500	1000	10,000
Normal	0.00	17.6	7.3	5.1	1.5
Right skew	0.76	9.3	4.2	3.0	0.9
Left skew	-0.76	23.4	9.2	6.3	1.9

II. Unbiased Valuations

- (1) Market prices: objective and tradable
 - » except perhaps for liquidity adjustment
 - » may not reflect economic fundamentals (?)
- (2) Close market counterparts
- (3) Model prices, based on NPV or option valuation models using risk forecasts
 - » however, valuation operates in a risk-neutral world whereas risk management uses the physical distributions

III. Risk and Artificial Volatility

- Accounting rules are not always consistent for recognition and valuation of assets and liabilities
 - » e.g. hedge of anticipated exposure or FAS 133 treatment of macro-hedges
- This could create “artificial” volatility in earnings, which seems to worry CFOs
 - » e.g. opposition to IAS 39
- Quest for low reported earnings volatility motivates “earnings management”

Artificial Volatility

- Issue is whether such volatility:
 - (1) represents true economic volatility and
 - (2) if not, whether penalized in financial markets
- Evidence that the apparent “tightening” of credit standards is explained by increased earnings management
 - » “Tightening Credit Standards: Fact of Fiction?,” (2005), Jorion, Shi, and Zhang

CONCLUSIONS

- The trend is toward mark-to-market valuation
- Risk measures are the next step, or changes in mtm values
- Risk measures are bound to take an increasing role in financial reporting
 - » accounting should incorporate risk measurement
- Measurement error in risk measures (Risk^2) should be described as well
 - » failure to address this issue is costly, e.g. non-recognition of portfolio credit risk models

