National and Kapodistrian UNIVERSITY OF ATHENS

Incorporating risk analysis into telecom investment projects

Dr. Dimitris VAROUTAS

Lecturer

University of Athens

Dept of Informatics & Telecommunications

D.Varoutas@di.uoa.gr

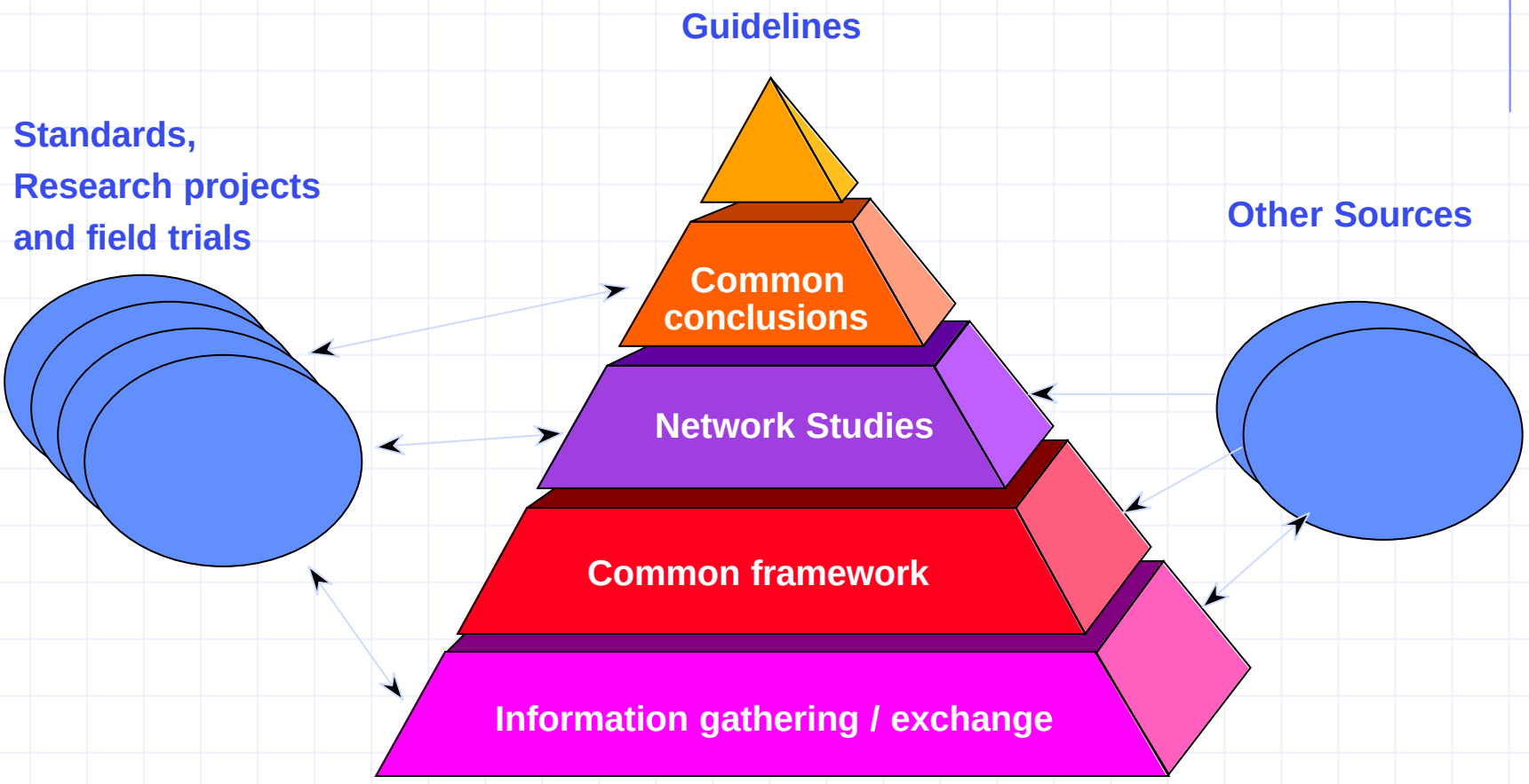
Agenda

- UoA in modeling telecom investments
- Risk analysis in telecom investments
  - The problem
  - The methodologies
  - The tools
- Some examples
  - Broadband access networks
  - 3G-WLAN business cases
- Conclusions & Discussion

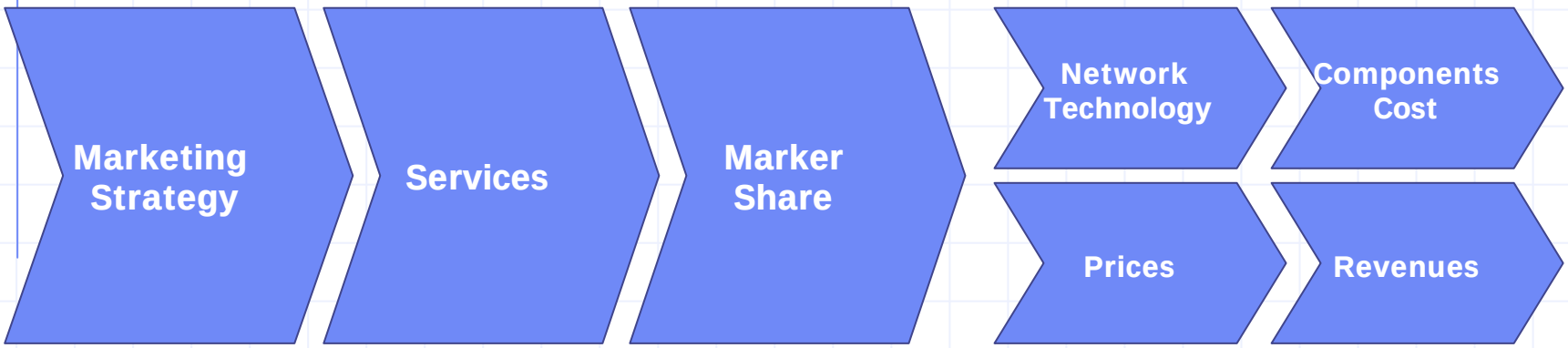
UoA Technoeconomic activities

- Conduct techno-economic evaluations for telecommunication investment projects like:
  - Next generation mobile networks and services
  - Fibre access evolution
  - Broadcast convergence
- Formulate pertinent recommendations to policymakers, network operators and service providers regarding communications investment strategies.
- Demand modelling
- Study the risk and externalities effects in communications
- Promotion and dissemination of the results

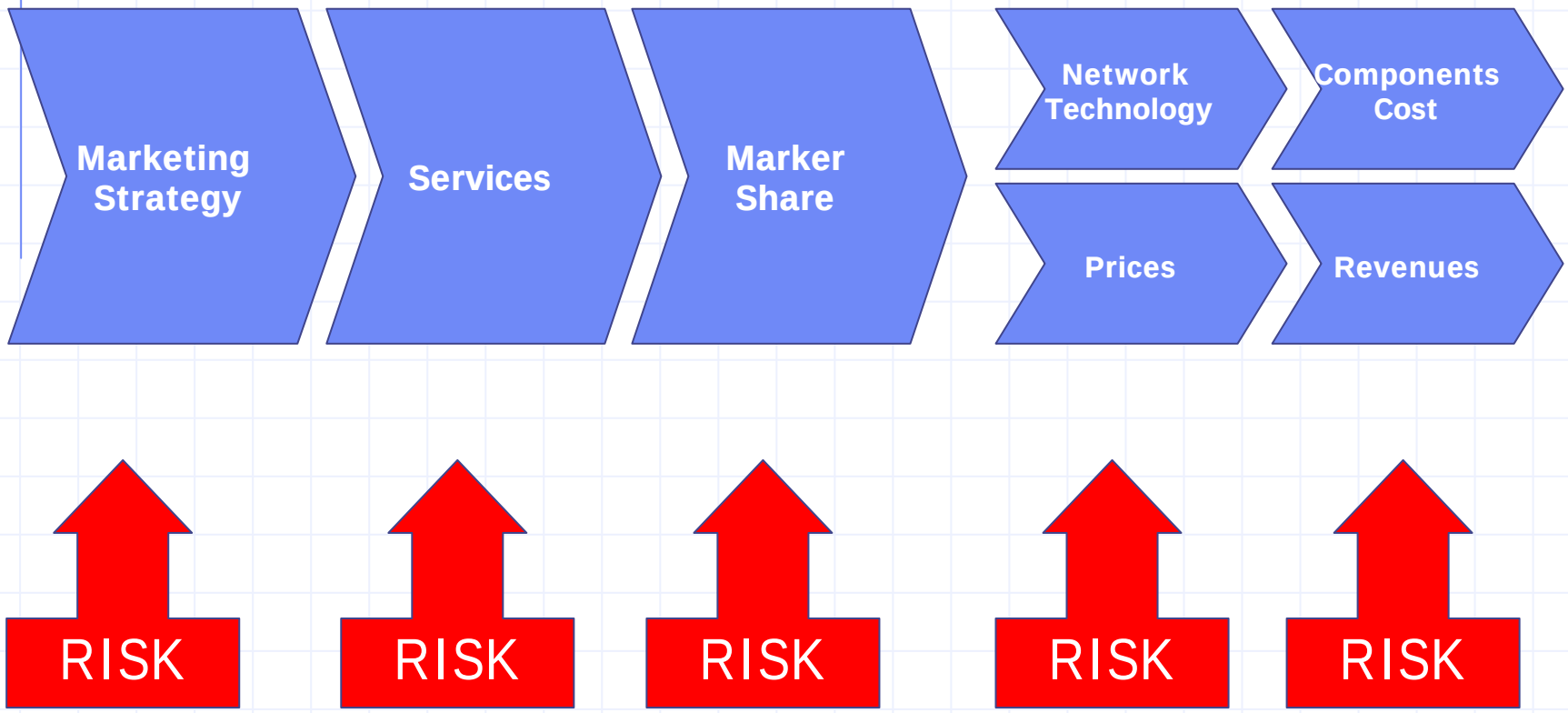
Consolidation of results and guidelines for deployment scenarios



Steps in technoeconomic modelling

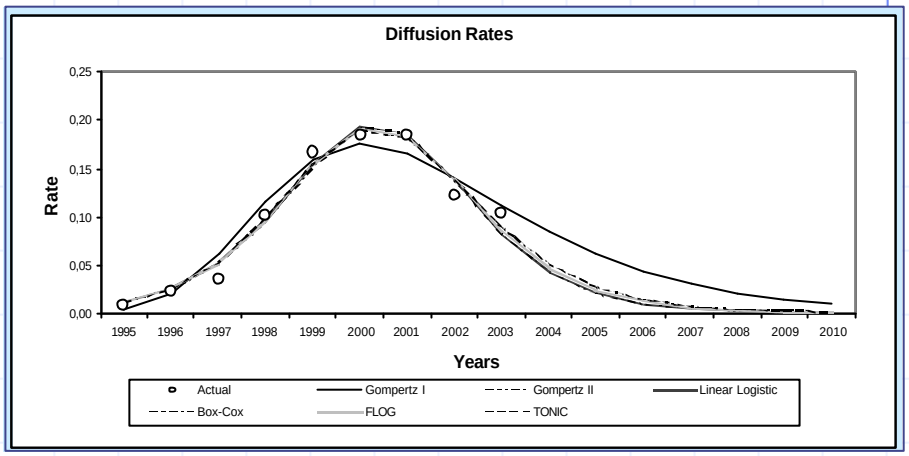


Risk and uncertainty are the only certain factors



Risk in marketing strategy

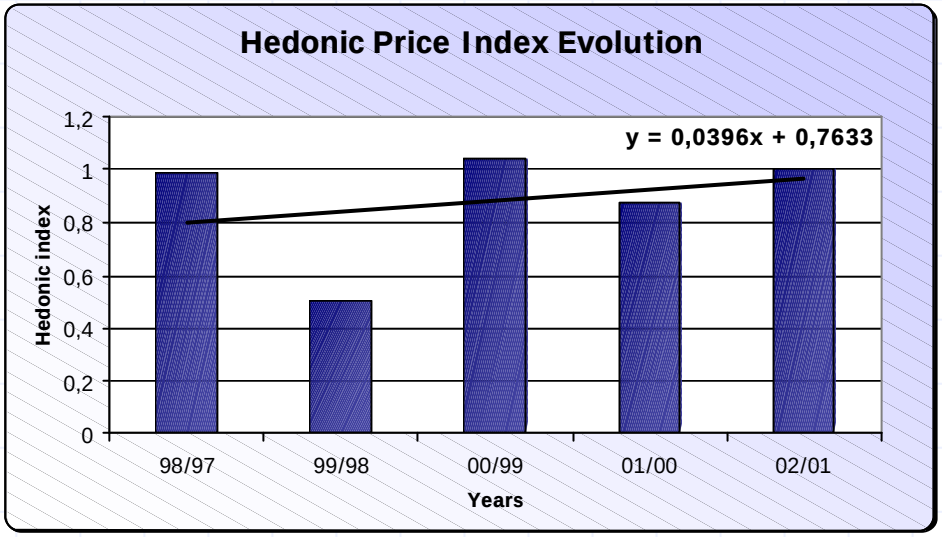
- Lucrative segments of markets/areas/services
- Suitable models for the evaluation of the segments
  - Diffusion or choice based models
  - Market studies or expert reports
  - Cross technology models
  - Cross country models



E.g. Can we evaluate and forecast the number of innovators and imitators?

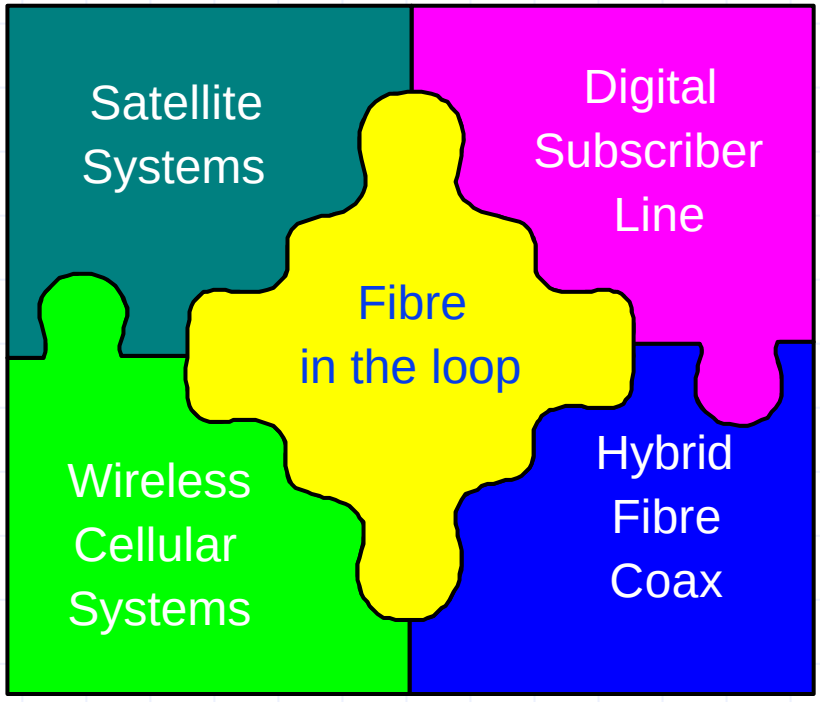
Risk in evaluating services

- Which are the profitable applications and services
  - Online or offline services
  - Determinants of telecom service
    - Rate
    - Distance
    - Mobility



Risk in choosing the network technology

- Can we take lessons for existing technologies
- Need for risk analysis in new technologies
  - xDSL
  - WLAN



Risk in evaluating pricing concepts

- Appropriate pricing models
- Evaluation of price models in real or simulated situations
- Unified price indices
  - across technologies
  - across services
  - across countries
- Need for new approaches in econometric models
  - Price elasticity
  - User behavior
  - Externalities
  - Cross technology effects

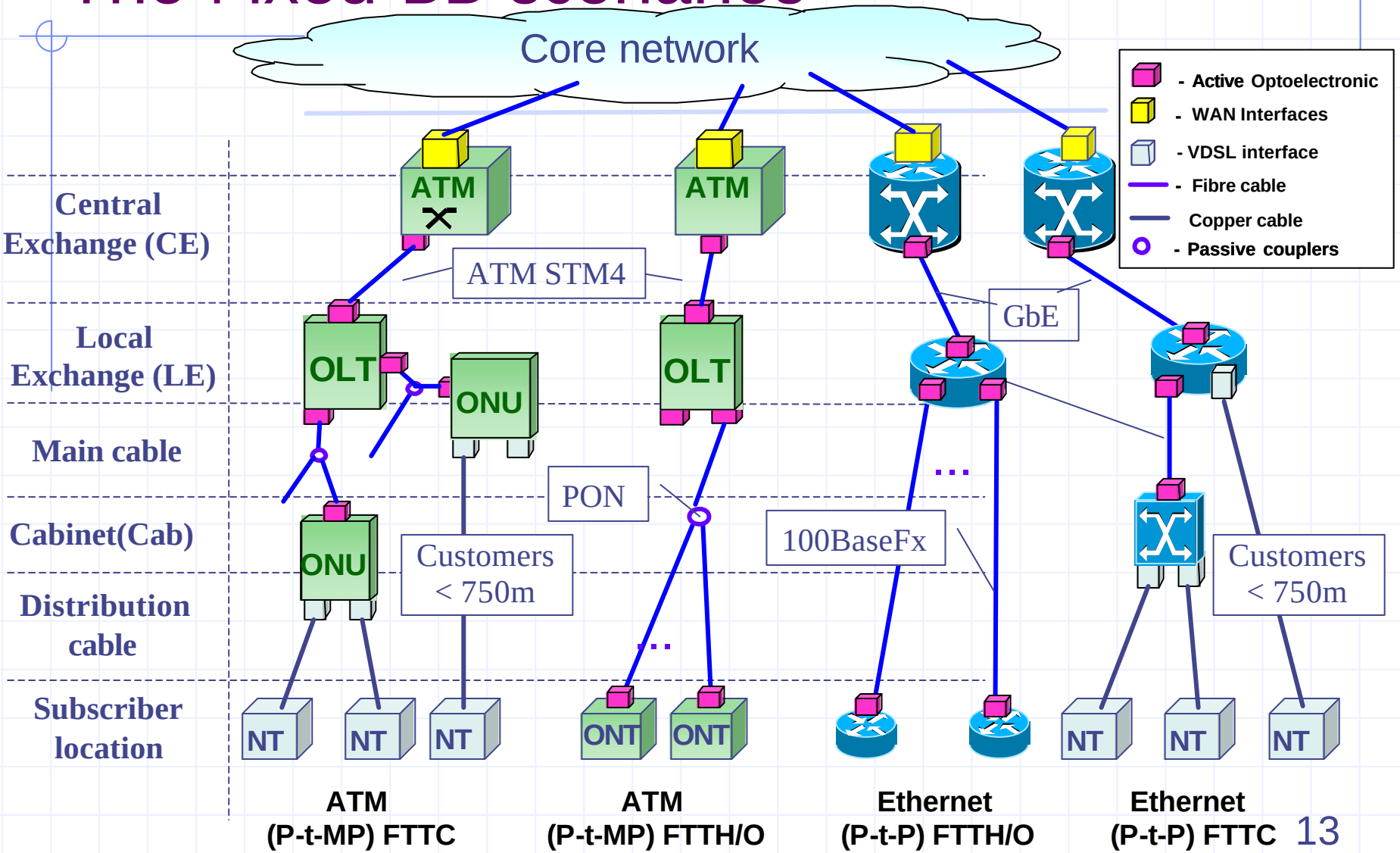
Risk analysis outputs

- Selection of technologies based on actual costs
- Concentration
- Non profitable cases
- Calculation of “costs per user” and “costs per subscriber”
- Optimum solution
- Rest value calculations
- Critical components
- Renegotiation of components’ purchase costs
- Profitable services
- Detailed analysis of services costs
- Rules and guidelines for viable cases
- Market opportunities

An example

Fixed BB telecommunication investments

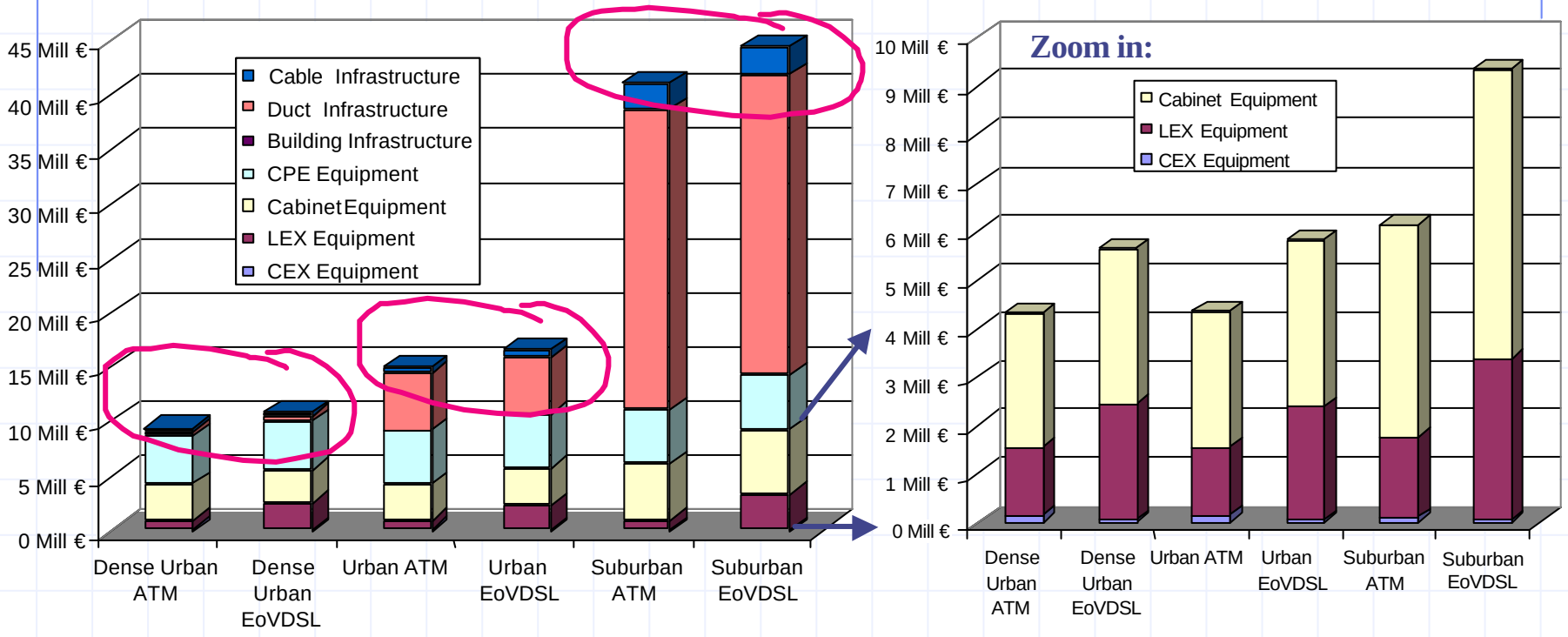
The Fixed BB scenarios



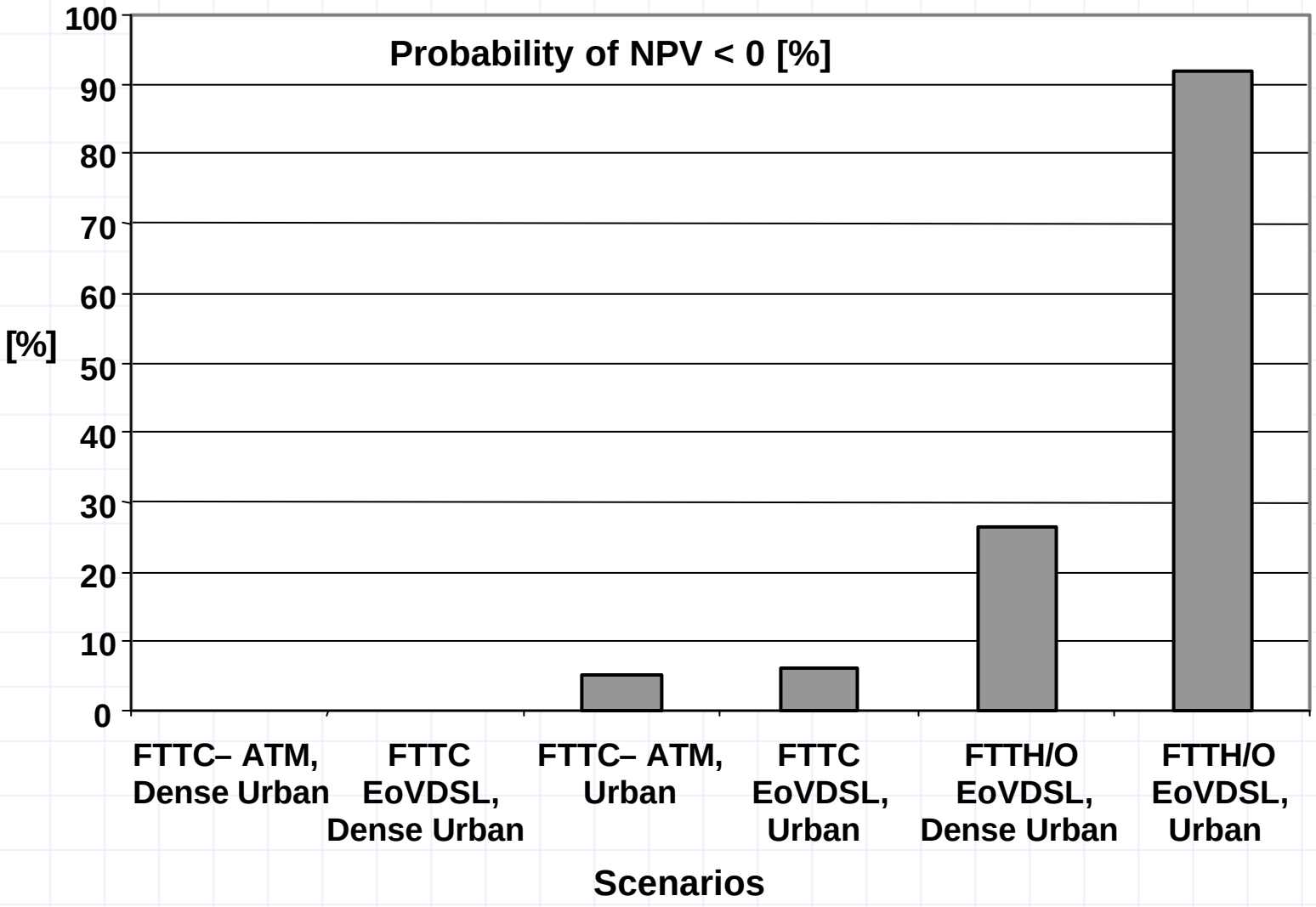
Financial results

	Net Present Value (NPV)			
	Fibre to the Cabinet		**Fiber to the Home/Office**	
Area	ATM	Ethernet	ATM	Ethernet
Dense Urban	29,45 mill €	29,40 mill €	18,31 mill €	7,47 mill €
Urban	18,13 mill €	18,06 mill €	-9,11 mill €	-22,30 mill €
Suburban	-34,42 mill €	-38,21 mill €	-279,49 mill €	-295,32 mill €
	Internal Rate of Return (IRR)			
	FTTC		**FTTH/O**	
Area	ATM	Ethernet	ATM	Ethernet
Dense Urban	66,8 %	56,2 %	46,1 %	21,5 %
Urban	30,8 %	29,7 %	no return	no return
Suburban	no return	no return	no return	no return
	Pay back Period [years]			
	FTTC		**FTTH/O**	
Area	ATM	Ethernet	ATM	Ethernet
Dense Urban	3,8	4,3	5,5	7,5
Urban	5,3	5,7	no return	no return
Suburban	no return	no return	no return	no return

CAPEX figures



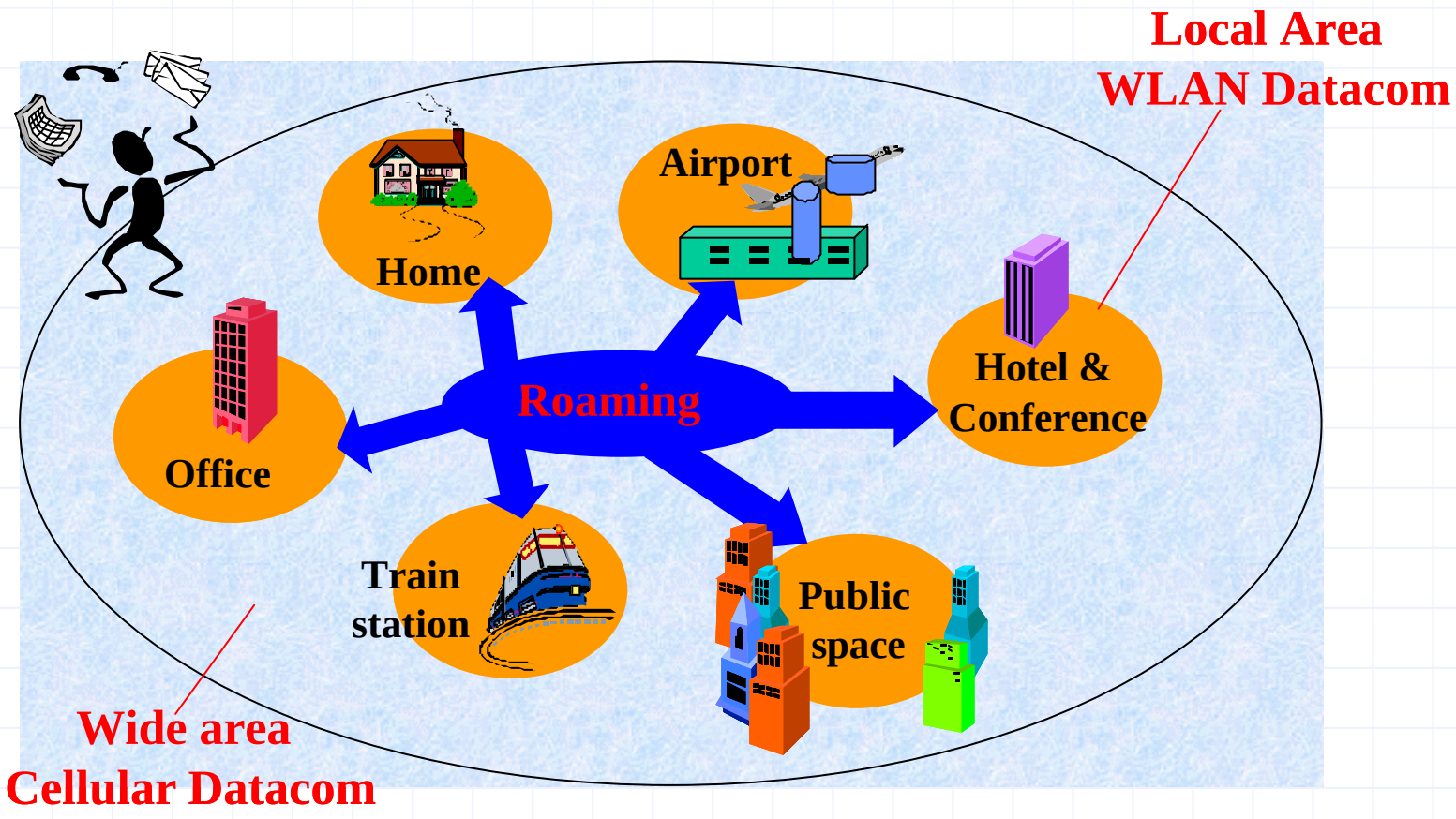
Financial risk in fixed BB investments



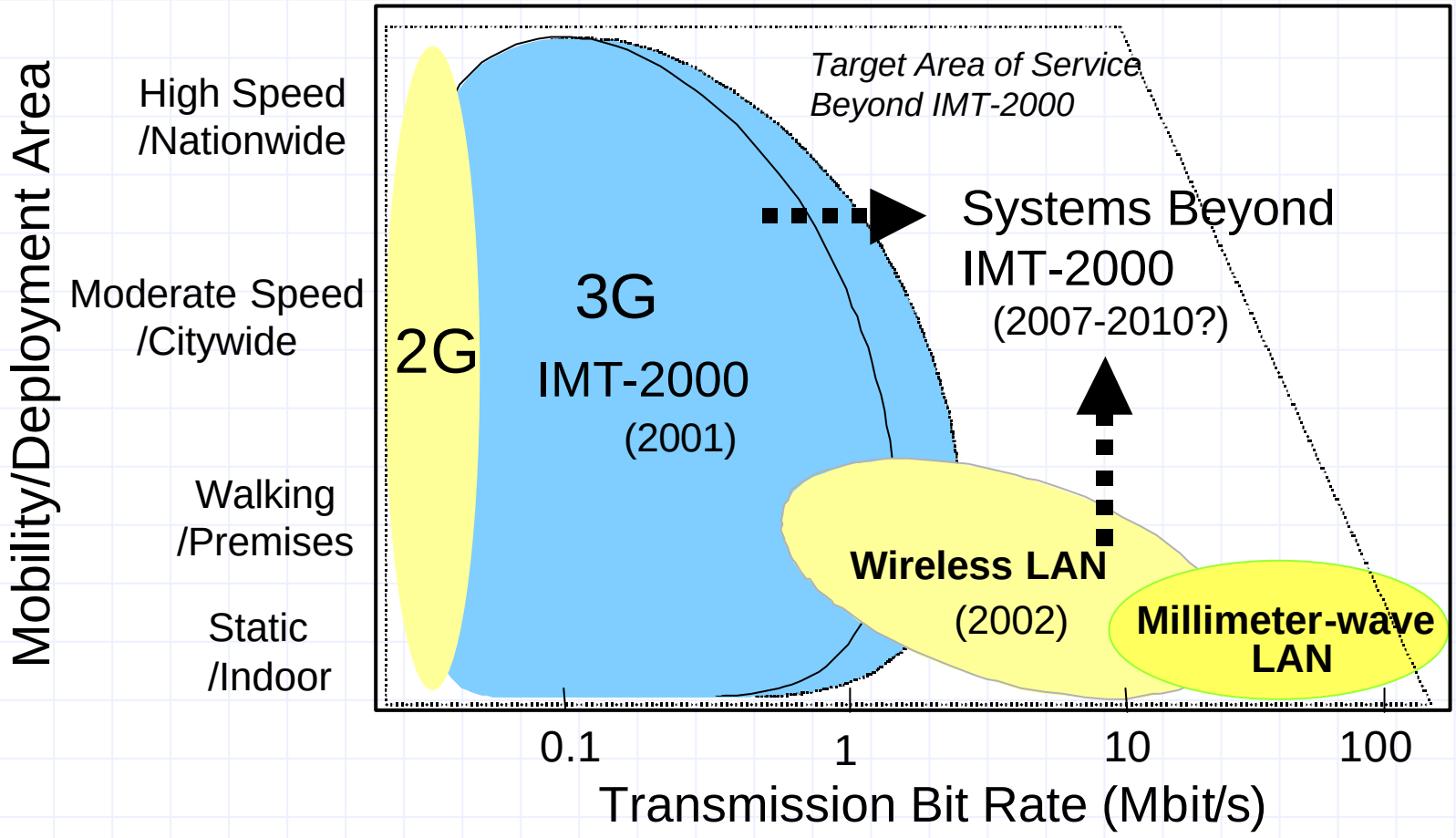
An example

3G and WLAN investments

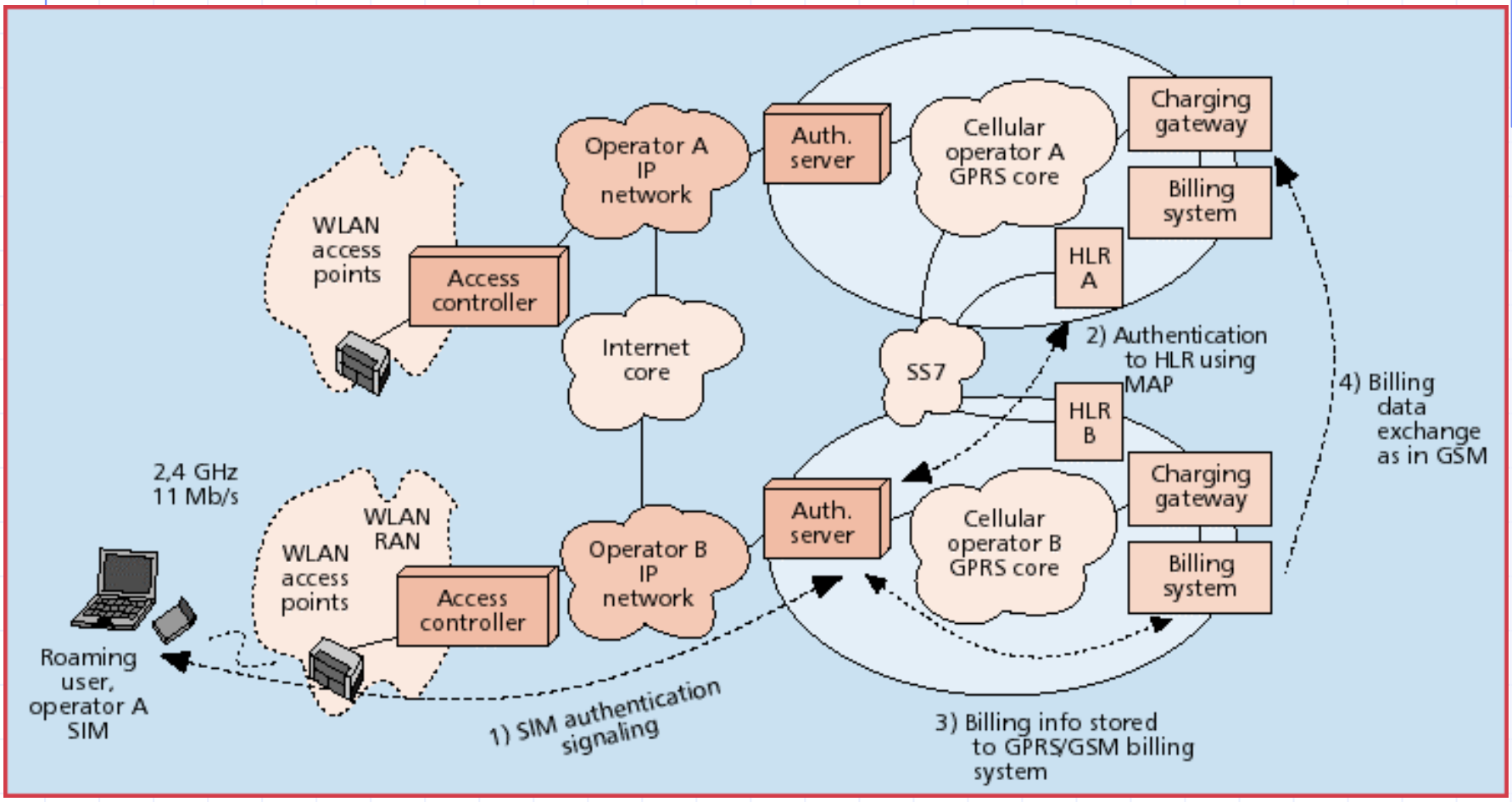
The idea for 3+/4G networks



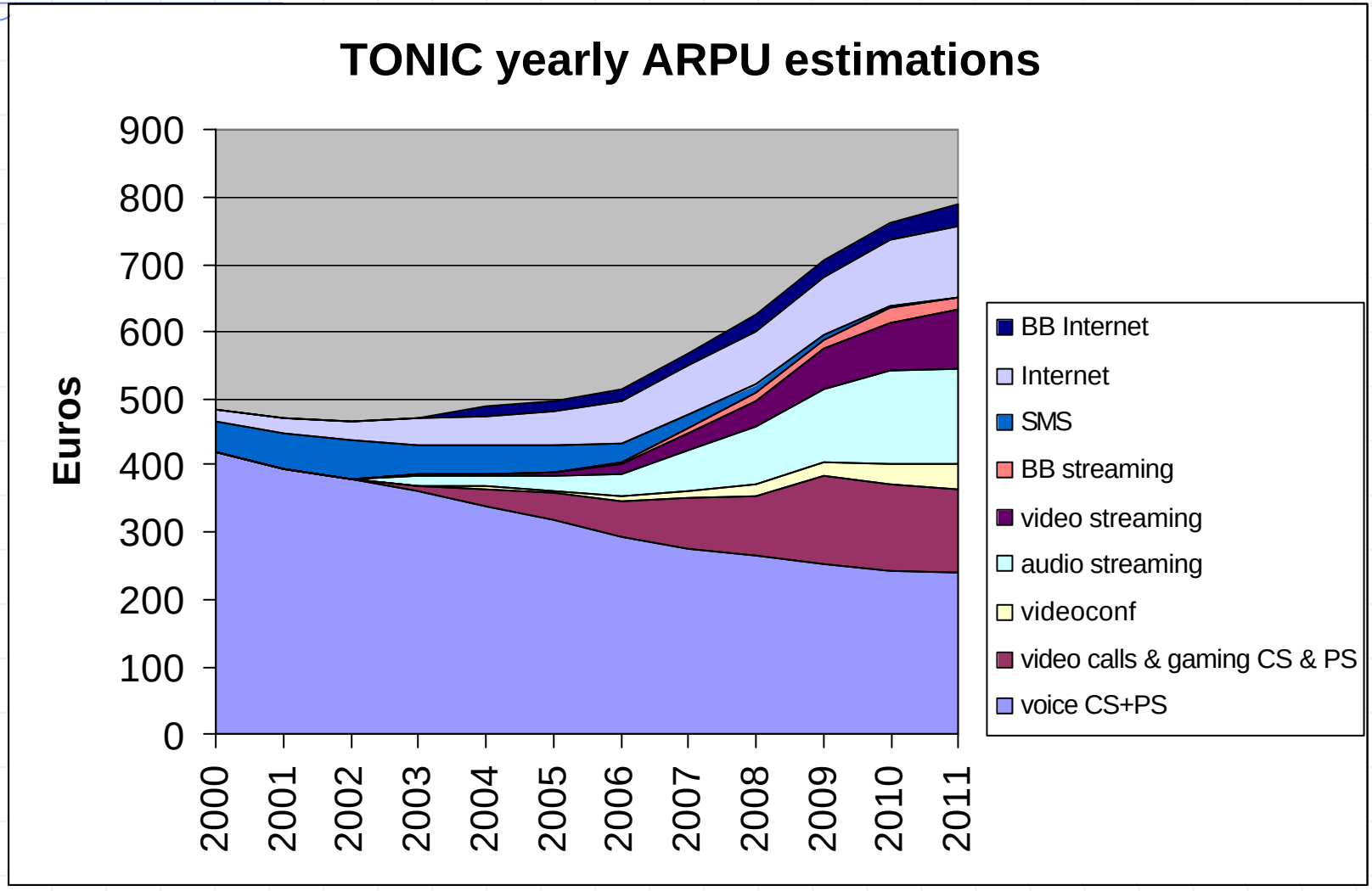
Transmission rate - Mobility



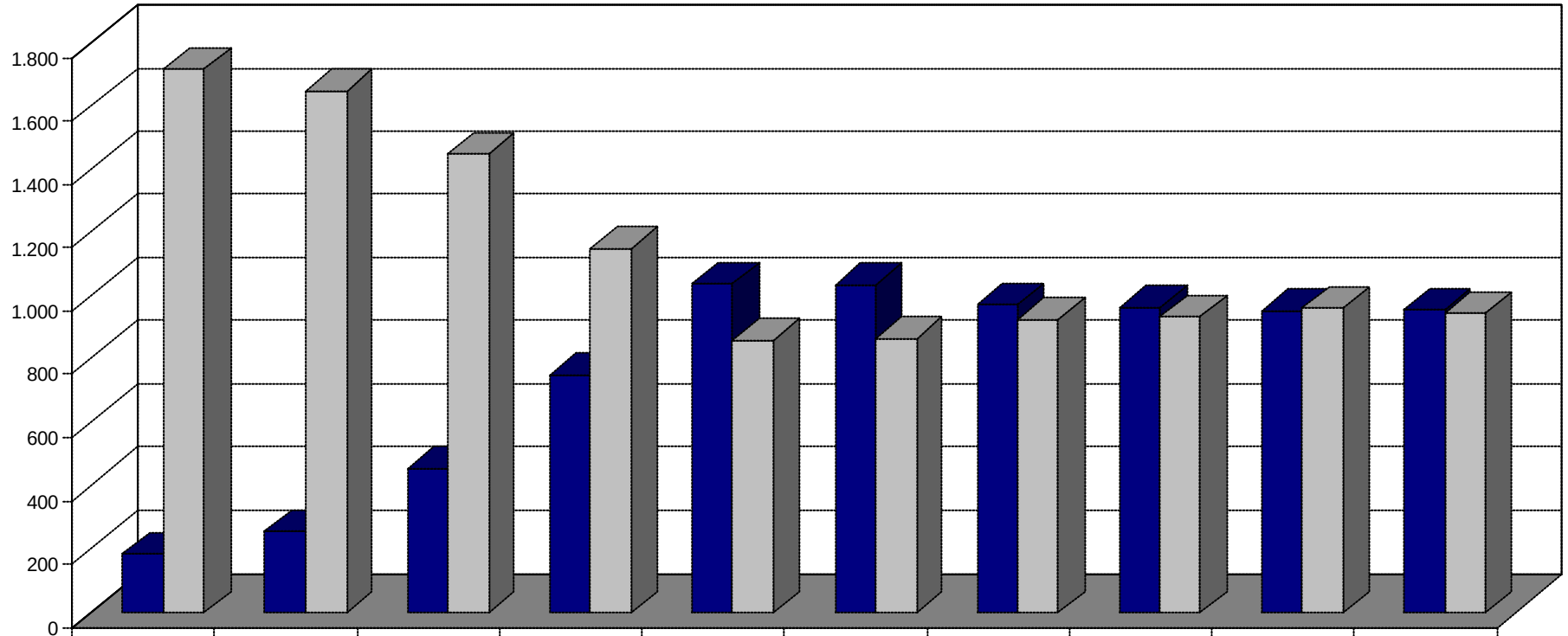
WLAN Roaming



ARPU Estimations



Sensitivity analysis



	Usage	Total Penetration	End Market Share	Start Market Share	OAM	UMTS BTS	Marketing Multiplier	Terminal Subsidy	WLAN Building Begin	Churn
Low Value	183	253	453	748	1.037	1.033	971	964	948	953
High Value	1.714	1.643	1.444	1.147	860	864	926	932	961	943

Risk factors

- Risk in marketing parameters
  - Market size
  - Market share
  - Service determinants
- Risk and uncertainty in network parameters
  - Technology costs
  - Technology changes
  - Cost components evolution
  - Area characteristics

Some ideas on telecommunications investments in developing countries

- Demand forecasting
  - Effects of cross-country diffusion processes
  - Competition level
- Technology selection
- Critical mass effects
- Communications or telecommunications

Conclusion

- Risk analysis is a critical issue for telecom investment projects
- Need for specific problem statement, methodology and tools development
- Research is needed as well as coordination among key players

Time for Questions & Answers

D.Varoutas@di.uoa.gr