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An Overview of Regulatory Tools or Instruments

**Paul Noumba UM
PPPI – WBI
The World Bank**



OVERVIEW

- **Quick introduction to WBI / PPPI**
- **Back to the basics of regulation**
- **Survey of the regulatory tools**
- **Conclusions**



The PPPI Program of WBI (1)

- **WBI is the learning and knowledge sharing branch of the World Bank Group**
- **The Public-Private Partnership in Infrastructure (PPPI) program was established in 1998, as the Infrastructure capacity building program**
- **End game of infrastructure reforms : Attract investment needed to expand coverage, access and improve reliability and affordability of infrastructure services**
- **Objective of the PPPI Program: promote the provision of affordable and sustainable infrastructure services in DCs through good regulation practice**



The PPPI Program of WBI (2)

- We believe that efficient and effective regulation is needed for successful **Public-Private** and **Public-Public Partnerships**
- Capacity building is as important as investment in physical infrastructure
- The PPPI program helps client countries address this challenge
 - » Learning events (LE) for **Policymakers, Regulators, and Advocacy Groups** in **Infrastructure Regulation and Finance**
 - » In FY04 – the program delivered 36 LE and trained 2150 participants from DCs
 - » In FY05 – the program intends to expand its geographic outreach through strengthened partnerships
- To contact us : www.wbippi.org or pnoumbaum@worldbank.org



THE BASIC ECONOMICS OF REGULATION

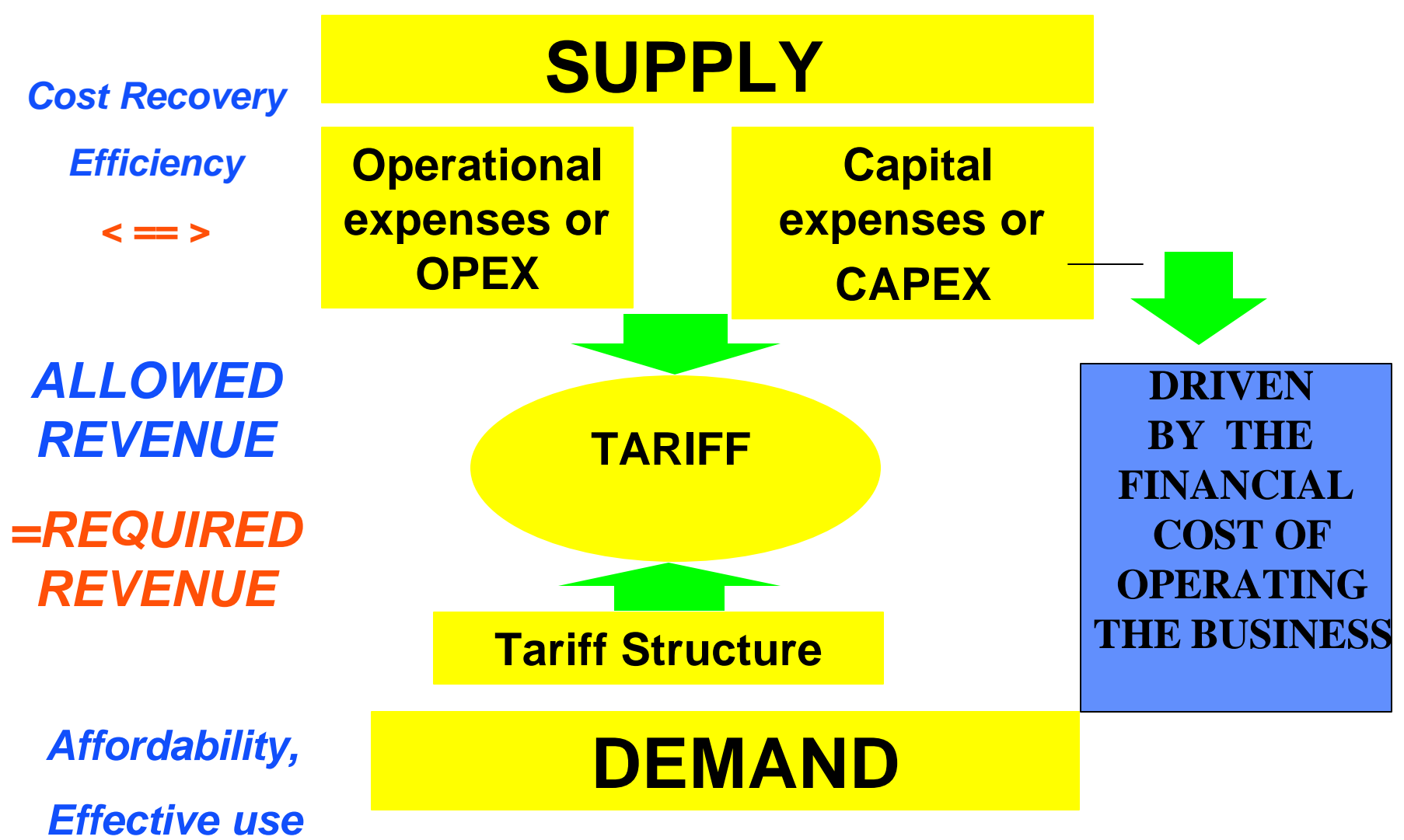
- **The main message from Textbooks:**
 - » **Price should maximize net social benefits of providing a service**
 - » **Net Social Benefits = Consumer willingness to pay – production cost**
 - **Willingness to pay is driven by the utility derived in the consumption of the service (availability, reliability, affordability)**
 - **Production cost is driven by service obligations, and provider efficiency**
 - » **=> Price = Marginal cost**

THE BASIC ECONOMICS OF REGULATION

- **Problem is that these rules yield a deficit when there are economies**
 - » => no private operator will be interested ...unless matching subsidies are provided
- **=> Option 1 is to rely on Ramsey pricing**
 - » Charge MORE customers who have no alternative (according to elasticity of demand of each user)
 - » => not great socially and potential for abuses
- **=> Option 2 is to rely on Average Cost Pricing**
 - » main question is what is the relevant average cost to be used for setting the average tariff?
 - WITH A PRIVATE OPERATOR: THE FINANCE OF THE BUSINESS SHOULD TELL YOU

THE BASIC ECONOMICS OF REGULATION

Figuring out the AVERAGE tariff level





THE BASIC ECONOMICS OF REGULATION

The Concepts of ANNUAL REQUIRED REVENUE

**Required rate
of return =
Cost of capital**

×

Asset Value

=

**Required
Benefits**

**Depreciation
rules**

×

Asset Value

=

**Depreciation
expenses**

**Operational
expenditures**

×

**Efficiency
Analysis**

=

Cost forecast

**Required
Revenue**

=> CAPEX + OPEX = REQUIRED REVENUE

Tariff calculation = Pick “P” such that:

$$\sum_{t=1}^T \frac{P_t V_t}{(1 + r)^t} - RR = 0$$

P = average tariff per unit of the service

V = consumption forecast => DEMAND FORECAST is KEY!

ρ = discount rate = cost of capital

RR = Required Revenue given costs to recover



LONG RUN Required Revenue = Revenue needed to cover costs

$$RR = \sum_{t=1}^T \frac{(G_t + I_t)}{(1+r)^t} + I_0 - \frac{I_T}{(1+r)^T}$$

I_0 = Initial Investment (value of assets at beginning of period)

G_t = Operational Costs for year t

I_t = Investment during year t

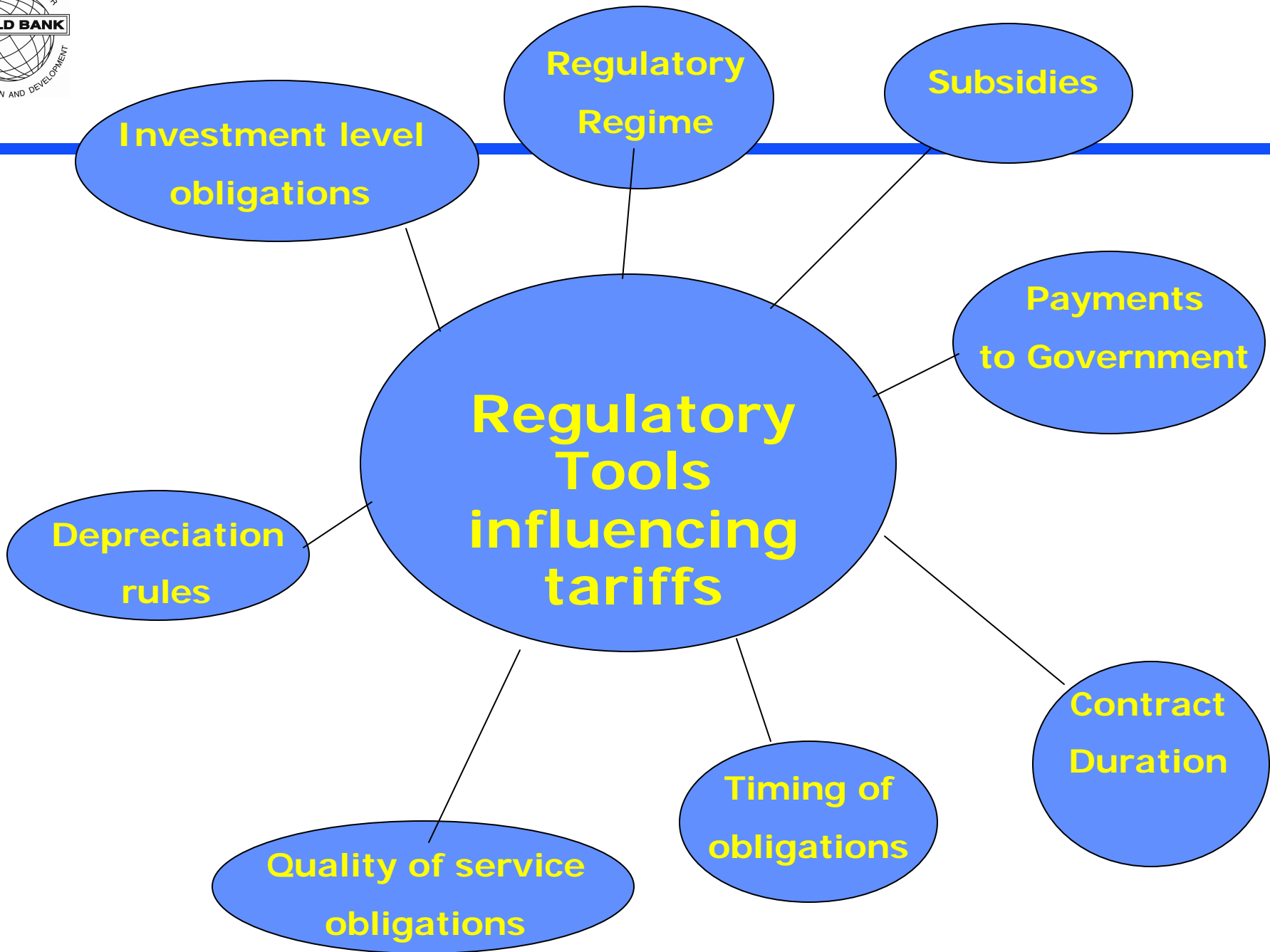
I_T = Residual value of investment (value of assets at end of period)

r = discount rate (or cost of capital)

RR = required revenues until year T

Regulatory variables highlighted...

Pricing Variables		Regulatory Tools or Instruments
Volume of consumption	V_t	Demand Assessment – Service obligations (coverage, QoS, ...)
Cost of Capital	ρ	Cost of Capital (assessment of risks....)
Asset Value at the beginning of the regulatory period	I_0	Depreciation rules, and other accounting rules
Asset Value at the end of the Regulatory Period	I_T	Depreciation rules and other accounting rules
Regulatory Period	T	Regulatory Regime
Investment	I_t	Investment obligations and timing, Coverage and QoS obligations
Operational Cost	G_t	Coverage and QoS Obligations



In Sum...

- **Ultimately:**
 - » **Regulated prices should make sense to the operators and be affordable to consumers**
 - » **Regulated prices should provide right incentives to consumers --- economic signals**
 - » **Revenue generated with regulated prices should comply with the rule of “Required Revenue”**
- **To do all this, regulators need to develop regulatory tools**

Regulatory Tools

- The contract with the government
- Quality rules and related penalties
- Tariff rules
- Benchmarking of efficiency levels

BUT ALSO:

- Asset valuation
- Estimates of the cost of capital
- Regulatory Accounting Guidelines
- The economic and financial regulatory model
- Indicators of financial viability
- A clear view of the analytical decision criteria
- (Demand assessments)

CONTRACTUAL

**Additional
Tools**



Regulatory Tools

The Contract with the government

- **Specifies rights and obligations of the parties**
 - » **Service coverage**
 - » **Investment**
 - » **Quality**
 - » **Timing of obligations**
 - » **Payment to gvt**
 - » **Subsidies**
- **Includes information disclosure and reporting obligations**
- **Core reference document of the Regulator**



Service Quality Regulation

- Build it into the contract
 1. Choose the level of quality desired.
 2. Choose the instruments for monitoring
 3. Information requirements or annex established in the contract
 4. Mechanisms for control
 5. Penalties for non-compliance with contract

Fines and Other Penalties

- Regulatory effectiveness requires a system of penalties
- Fines and penalties should be economically justifiable
- So...« *The punishment should fit the crime!* »
- It is hard to establish the amount that the operator has gained, and how much the users have lost because of the violations of the standards in the contract
- Examples
 - autobus: fine = unit costs X route-kms not provided
 - train delays : fine = lost time X average salary
- In practice, define the fines in terms of formulas specified in advance in the contract
- Maximum penalty : termination of contract is not a credible threat (feasibility? transition?)



Regulatory Tools Pricing

- **Legislation and implementing decrees or regulations**
- **Legal specification of tariff structure**
- **Most Importantly : Tariff Adjustment Rules**
 - » **Indexation Rules**
 - » **« Pass-Through » rules**
 - » **Ordinary and Extraordinary tariff revision rules**
- **Specify penalties in legal documents**



Regulatory Tools

Benchmarking and Efficiency Measures

- **Reforms aim at improving cost recovery and cutting costs**
- **Efficiency gains are an economic rent to be redistributed between providers and consumers**
- **Hence the need for their accurate measurement**
- **Regulator should :**
 - » **Announce how these gains will be measured**
 - » **Enforce accounting guidelines to collect appropriate and relevant data needed**
 - » **Explain how results will be used in regulatory decisions**
 - » **Specify a related consultation process**



Regulatory Tools

Asset Valuation

- **The asset value IS what investors want at least to preserve and ideally to increase**
- **With the cost of capital, it allows the determination of the « Required Benefits »**
- **With specified depreciation rules, it allows the determination of the amortization expenses**
- **Should be updated regularly,**
- **Pay attention to the valuation method**



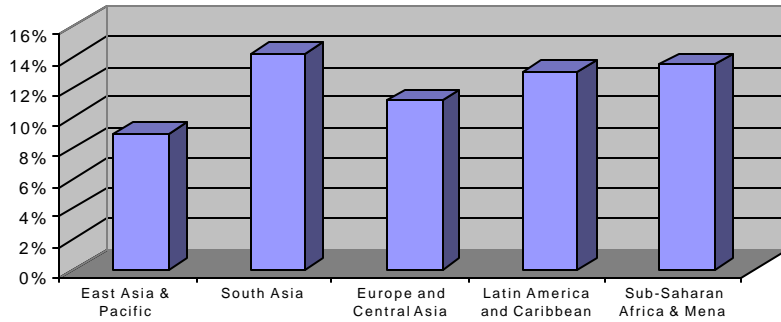
Regulatory Tools

Estimate of the cost of capital

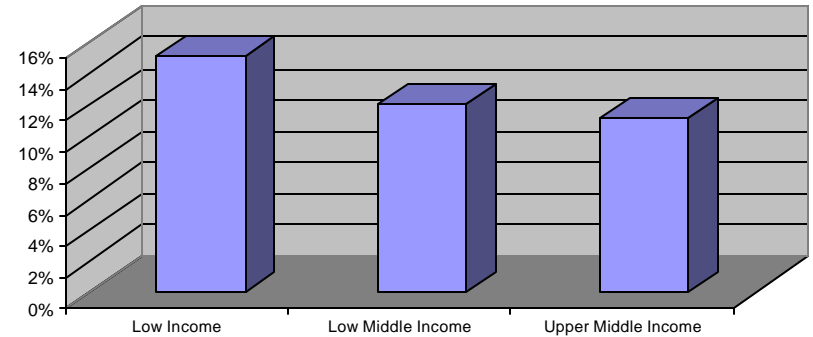
- **Minimum rate of return allowed to the operator of a regulated industry...**
- **Requires a fair assessment of risks (political, regulatory, exchange rate,...)**
- **Should Rely on a sound Methodology**
- **Should be reviewed periodically simply because markets conditions change**

Cost of Capital (1998-2002)

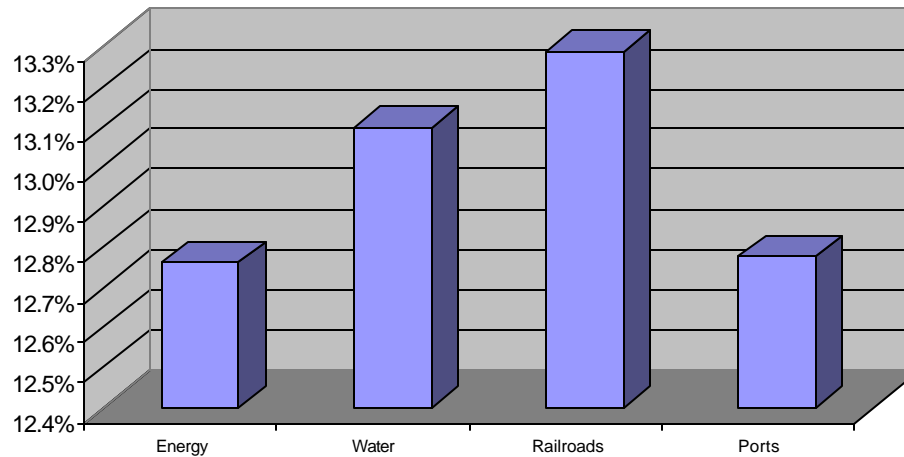
Cost of Capital by Region



Cost of Capital per countries according to Income levels



Cost of Capital by Sector





Regulatory Tools

Regulatory Accounting Guidelines

- **Core instrument to generate the information required for effective regulation**
- **Includes guidelines on**
 - » **Depreciation**
 - » **Cost allocation**
 - » **Expenditures forecast processes**
- **Unavoidable as few countries tend to generate good economic information for regulators**
- **Should be included in the contract**



Regulatory Tools

The financial and economic model

- **Analytical framework**

- » **Ensuring internal consistency of the :**

- Obligations bear by the parties and any future change anticipated
- The different regulatory tools,
- Assumptions on the behavior of the main actors

- » **Quantifying the impact of the different options to all actors based on transparent rules**

- **Calculates the Internal Rate of Return (IRR) of the Activity based on the agreed assumptions**

- » **Which means nothing unless compared to the cost of capital !!!**

Regulatory Tools

A clear decision criteria

- **IF IRR = CoC => ideal**

- » NPV of activity is 0
- » No « excessive » profit is earned by the operator
- » Comparable to a competitive markets returns

- **If IRR > CoC => « Excessive » Profit**

=>Regulatory action needed at revision time (e.g. cut tariff, subsidies,...)

- **If CoC > IRR => Risk of bankruptcy**

=>Regulatory action may be needed to ensure service continuity (e.g.: subsidy, change in service obligations level or timing, ...)



Regulatory Tools

Financial viability criteria

- **Control of standard financial indicators:**
 - What credit rating agencies would look at to check the credit worthiness
 - Cash flows in terms of equity, assets and free cash flows
 - Debt ratios, liquidity, debt composition
- **...also need to check the consequences of limited access to capital markets**

WBI Offerings in Regulatory Tools

Type of activity	Technical Courses	Poverty Concerns and Infrastructure	Courses on Emerging Policy Issues
Target Audience			
Regulators and Private Operators	<ul style="list-style-type: none"> ■ Financial Models for Regulators ■ Efficiency Measurement ■ Access Pricing ■ Asset Valuation ■ Infrastructure finance 	PPPI and Regulation in Urban Services and Transport	Competition Issues in Regulated Industries
Policy makers and Advocacy groups (Users Groups, Journalist, MPs)	Transparency in infrastructure concession	PPPI and the Poor	Competition Policy and Regulation for Non-Economists Utility regulation for non specialist
Academics (Researchers + Regulators)	Masters Program in Utility Regulation (Francophone Africa and Latin America)		

Main Challenges

- Main challenges of effective regulation
 - » Determining fair balance between interests of consumers and investors
 - » Balancing certainty for investors with the need for flexibility to respond to changing conditions (e.g.: Argentina)
- Principal risks faced by regulation
 - » Poor information available to regulators
 - » Risk of political or industry “capture” of regulatory process
- Refrain from micro-management
 - remember why you liberalized in the first place
 - don't substitute poor regulation for poor performance