Cost Estimating in a changing World

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Abstract – **Over the years, economic developments, changes in the world lead to the change of the concepts and techniques/methodologies for profitable investments.**

I. INTRODUCTION

During the last two decades there were significant changes in the economic world.

The deeply change of the positions of all levels of power and the deeply modification of the development, the under development concepts and growth have led to the change the basis, the approach and the reliability of all the attempts of predicting and forecasting.

The purpose of this document is to explain what are the practices and methodologies to be used to estimate cost and time of an investment in this modern economic world.

II. CONTENT

Nowadays the world economy does not have anymore a guarantor of the global equilibrium and stability then investments have to guarantee their equilibrium in an independent and autonomous way.

This important alteration are due to the deeply change that there was in the positions of all levels of power. Important examples are the change that have occurred in the positions of the Sovranational organizations, the International Financial Power, the National Governments, the Multinational Companies and the Investment Projects.

However this was not the only cause of the change of the economic world because in the last two decades there were also deeply modifications in the development, the under development Concepts and Growth.

The real (productive) economy is not anymore a characteristic of the Western society, struggling to survive in the financial markets basing their analyses on creative, virtual and dubious principles, in order to be able to maintain the control and the financial power, triggering a competition between the Virtual and the Real Economy.

In this modern economic world all the attempts of predicting and forecasting have to change their basis, approach and reliability.

The investor, undertaking the realization of a Project not only complicated but also complex, has to adopt practices and methodologies of deterministic type and scientific basis, in order to predict the cost and the time necessary to complete an investment project.

Is possible to realize a cost estimate in a professional manner only if using an internal and external database and a Benchmarking reference, applying a unique and transparent methodology.

The estimate to be completed must include the "Technical Allowance", using the ICEC and AACE rules for the allowances classification. The allowances are related to the value included in the line items "Base Cost", which are set aside for specific items that are not or cannot be fully specified at the time of the estimate. The allowance level depends on the stage of completion of the project design.

Once completed the estimate is extremely important to understand which are the uncertainties affecting the same in order to choose properly the level of contingency to be adopted. These uncertainties are calculated at a project level and their calculation methodologies are detailed and based on a Risk Analysis. This analysis allows to detect the main Criticalities and to highlight the Technical and Managerial uncertainties which interest the Project time and cost.

The investor has to define his attitude towards risk (based on the main Project subjects: criticalities, market conditions, etc.) and to establish the adequate level of Contingency to cover the possible negative effects.

III. CONCLUSION

The ability to predict economic behaviour of investment projects and predict potential risks and their mitigation it has become of paramount importance for all the actors involved in the "game of the economic development" of the world.

In this modern economic world, without global guarantees of balance and stability, the solution is to focus on the investments and try to ensure their equilibrium.

This equilibrium can be achieved through the use of scientific and deterministic methodologies by investors to estimate the cost and time of each investment.

A. Figures and Tables

| ESTIMATE CLASS	Primary Characteristic	Secondary Characteristic			
	LEVEL OF PROJECT DEFINITION Expressed as % of complete definition	END USAGE Typical purpose of estimate	METHODOLOGY Typical estimating method	EXPECTED ACCURACY RANGE Typical variation in low and high ranges [a]	PREPARATION EFFORT Typical degree of effort relative to least cost index of 1 [b]
Class 5	0% to 2%	Concept Screening	Capacity Factored, Parametric Models, Judgment, or Analogy	L: -20% to -50% H: +30% to +100%	1
Class 4	1% to 15%	Study or Feasibility	Equipment Factored or Parametric Models	L: -15% to -30% H: +20% to +50%	2 to 4
Class 3	10% to 40%	Budget, Authorization, or Control	Semi-Detailed Unit Costs with Assembly Level Line Items	L: -10% to -20% H: +10% to +30%	3 to 10
Class 2	30% to 70%	Control or Bid/Tender	Detailed Unit Cost with Forced Detailed Take-Off	L: -5% to -15% H: +5% to +20%	4 to 20
Class 1	50% to 100%	Check Estimate or Bid/Tender	Detailed Unit Cost with Detailed Take-Off	L: -3% to -10% H: +3% to +15%	5 to 100

Fig. 1. The levels of Estimating.
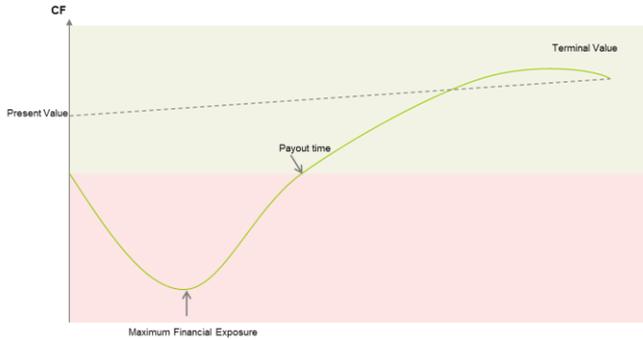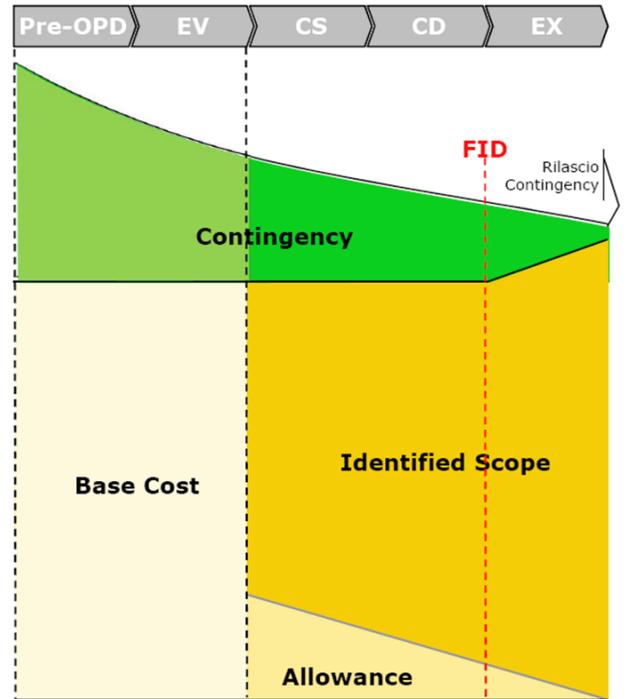

Fig. 2. Investment Characteristic Curve

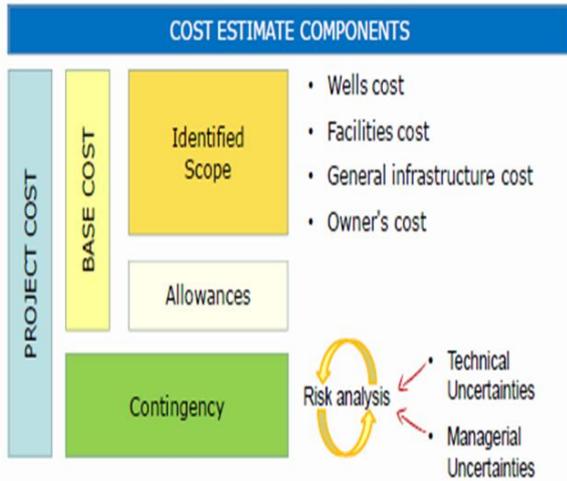Fig. 3 and 4. Techniques for predicting the Base Cost.

Fig. 5 and 6. The accuracy.

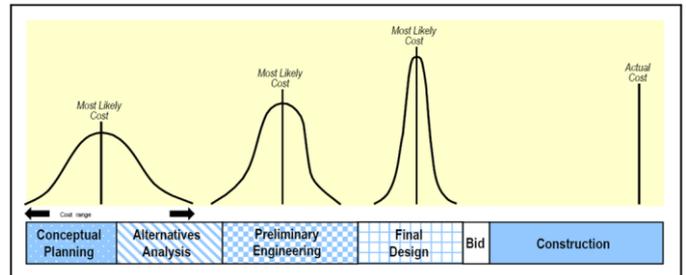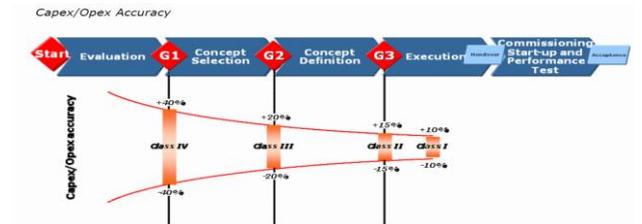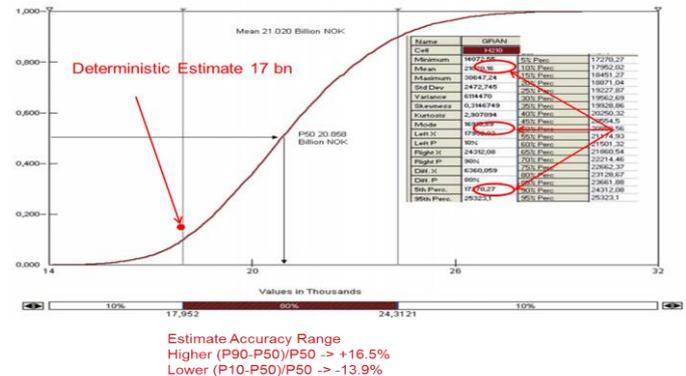Estimate Accuracy Range
Higher (P90-P50)/P50 -> +16.5%
Lower (P10-P50)/P50 -> -13.9%

Fig. 7. Risk Analysis.

B. Definitions

Accuracy: is as the tolerance in the mechanics and depends on the processing tools that apply to obtain the artefact. It is an objective concept and has a variation measured on Empirical* basis during the development phase of the project.

Attitude towards risk: is the ability of the decision maker to take a risk and be ready to face and mitigate its consequences in the case of verification of the same.

Contingency: is an amount of economic provisions that aim to cover from endogenous and exogenous risks. Even this case is based on a variation measured on Empirical* basis during the development phase of similar trend of accuracy but not the same.

Confidence: is an objective fact and depends on the evaluation methods of the production process and of its state of completion.

(*) There is no quantitative statistical reliability that supports the range indicated by the funnel and is totally arbitrary and based on the Expert Judgement.