NEW ISSUES IN NATURAL MONOPOLIES REGULATION: THE FINANCIAL SIDE IN INFRASTRUCTURE PROJECTS THROUGH PUBLIC PRIVATE PARTNERSHIP

by sergio A. Hinojosa

NEW ISSUES IN NATURAL MONOPOLIES REGULATION:
THE FINANCIAL SIDE IN INFRASTRUCTURE PROJECTS THROUGH PUBLIC PRIVATE PARTNERSHIP

by sergio A. Hinojosa

FINACIAL REGULATION

FINANCIAL REGULATION

1 UTILITIES REGULATION VIS A VIS INFRASTRUCTURE REGULATION

The theories developed for monopoly regulation have been oriented towards utility companies, such as waste management, electricity, water, and telecommunications. The functional structure of these companies is that of a corporation, whose real assets are composed of its facilities, machinery, equipment, and the corresponding contracts to deliver services to its customers. The ownership structure of utility companies is diverse: public monopolies, companies partially owned by the state, corporations entirely owned by private investors, and enterprises with rights over a previously defined time period on assets that belong to the state.

The most common regulation techniques to deter utility companies from charging elevated prices are: a) Rate of Return Regulation, and b) Price Cap Regulation.

Rate of Return Regulation.- under this technique, the authority sets a fixed rate of return over the assets so that the utility company is able to charge a price that is consistent with the objectives of the regulators. Prices of utilities provided can be adjusted depending on the returns on assets realized by the company. Prices can only be increased/decreased in case the realized rate of return is lower/greater than the rate of return.

Price Cap Regulation.- this type of regulation has been increasingly applied in regulated industries under the belief that it provides strong incentives for the enterprise to be efficient. Under this technique, prices are yearly adjusted according to inflation plus or minus a fixed amount that is not related with the company returns. Price Cap Regulation does not indicate how prices should be set for the first year of operation; it only establishes an indicative rule of how these prices will change over time.

In order to comply with their commitment to deliver utilities in the most efficient manner, monopolies must carry forward an investment plan that is often agreed with the regulatory authority. However, the implementation and financing of this investment plan is the sole responsibility of the regulated company. Monopoly regulation theories do not contemplate how monopolies finance their investment plans, and what risks they undertake in doing so. Possible explanations for this might be that: a) in the case of natural monopolies under state ownership (public companies), there is always present an explicit or implicit guarantee from the government, and b) in the case of natural monopolies in private hands (privatized companies), financing is often conducted under a corporate finance context, where the backing of the debts incurred is the valuation of the company per se and of its real assets.

In the case of public infrastructure monopolies, and specifically in the case of roads, the primary real asset in general does not belong to the firm. This is the case under the Public Private Partnership scheme, where financing takes place under three conditions:

a) that cash flows from the project should offer a return sufficiently attractive to risky capital;
b) that the level of guarantees, collaterals, and insurance provide creditors with confidence regarding the commitments and debts contracted;

c) that the capital structure of the project be capable of separating the risks of the project from the risk of the promoters of the project.

Private participation in ground transportation infrastructure has generally taken place by means of contracts with governments, with defined time periods, where the private sector has the obligation of building and/or operating and/or giving maintenance to determined infrastructure in exchange of the right to charge a tariff or toll that remunerates the provision of such services and that covers the investments allocated towards that end. Such association contract (henceforth denominated PPP contracts) establishes the risks to be assumed by the state and the private sector. The PPP's are materialized through a policy of distribution of risks towards the agent better prepared to assume them.

Since private participation in infrastructure projects does not take place through a corporate finance structure, but rather by means of Special Purpose Vehicles in which corporate capital budgeting techniques are not directly applicable. In this case, *project finance* comes forth, and is applied as a financial structuring technique to projects where, given the magnitude of investments and the extension of capital recovery periods, promoters often cannot participate alone without assuming unreasonable risks.[1]

Projects undertaken through PPP schemes share characteristics that differentiate them from traditional projects. Among them:

a) A primary asset, a roadway for instance, which is not the property of the firm, but rather of the State; hence, the real asset is not susceptible to being used as a collateral. Consequently, other assets are used as collaterals.

b) In general, the projects have no representative "history" to allow the forecasting, with a certain degree of confidence, of net cash flows of the project. In cases of projects of type green field and/or non-tariffied roadways, traffic statistics do not exist, thus evaluation of costs and cash flows in these cases require greater degrees of sophistication.

The project financing and PPP concepts in infrastructure monopolies drive towards the incorporation of a new perspective in natural monopoly regulation: the financial dimension. Regulation of infrastructure monopoly (IM) should not be governed only by economic efficiency and social welfare criteria. It should also incorporate the identification, assessment and allocation of a project's risks from a financial standpoint.

2 GENERAL FOCUSES OF THEORY MONOPOLY REGULATION

Regulations arise from a political filtering of individual demands motivated by current situations and technological advancements. Therefore, there are two basic fundaments for regulation: a) on the demand side, the demand for regulation from individuals, and b) on

[1] See Finerty, J. (1997) Project Financing: Asset Based in Financial Engineering, John Wiley &Sons, Inc., for a further distinction between corporate finance and project finance.

the supply side, the mechanism under which individual demands are transformed into policy.

Two broad theoretical focuses provide the fundaments necessary for the analysis of regulation: public interest (which criticizes market failures from an efficiency point of view), and private interest (which stresses individual demands for regulation and their transformation into policy).

2.1 Regulation and the Ground Transportation Infrastructure Market

Perhaps the main characteristic of the ground transportation infrastructure market is that it is very difficult for the market, by means of a price system, to allocate resources in an efficient manner, such as in the case of other services and sector of the economy. In this case, in general, the market system fails because roadways are considered by users to be a public good. Hence it results impossible to conciliate economic efficiency (Samuelson Rule), financing, and preference declaration for the good, since it is very costly to bring together all users and make them declare accurately their disposition to pay and their preferences for the service. Moreover, users have strong incentives to sub declare their disposition to pay, thus allowing the existence of free riders.

Moreover, there exists the problem of Natural Monopoly, where it is more convenient to have a single agent providing a given service (a single roadway between two points) given the existence of a huge fixed cost for doing so, as in the case of ground transportation infrastructure.[2]

These situations cause the failure of the market in efficiently allocating resources in infrastructure projects. Even if there existed a mechanism that accurately solved the market failures previously indicated, and in which the private sector provided the investment resources, there would still prevail the problem of asymmetric information: the regulator must then guarantee a notion of public service that takes into account quality of service and access equality in order to define and defend the collective interest.

2.1.1 The problem of Natural Monopoly

The first question to be addressed in infrastructure regulation policy is whether there exists a Natural Monopoly in the sector under consideration. There are a number of theoretical arguments conducing to believe that the production of underlying services in a roadway do exhibit economies of scale[3] and of scope, therefore representing an industrial configuration of the natural monopoly type. This is so because the operations costs is included in the cost of the invested capital, which is fixed given the magnitude of the project. Hence, the average cost per user is decreasing.

---

[2] For further reference, see Train (1993), Philps (1986), Sibley (1987), Panzar (1989), Braeutigam (1989) and Hau (1993).

[3] In the case of monoproduction, economies of scale exist when the average long-term costs are greater than the marginal costs.

The implications of the latter statement is that tariffication at marginal cost for the provision of infrastructure is not viable since monopolists do not finance their own fixed costs, and because if costs decrease and/or demand strongly increases due to conditions endogenous to the industry, it is also possible to observe *ex post* monopolic gains.

To illustrate the case of economies of scale and natural monopoly, assume that 100 units of service per kilometer of roadway must be produced and that the service can be provided by either a single firm or by two. Each firm has a fixed cost equal to 100, regardless of the level of production. The variable costs are equal to 1. If the 100 units are produced by a single firm, the average total cost will be equal to 2, which is the sum of 1 from the average variable cost and 1 from the fixed cost. If the same production is provided by two firms, each producing half of the total 100 units of service per 100 kilometers of roadway, then the average total cost will be 3, or 1 from variable costs plus 2 from fixed costs, which is the result of 100 per firm divided by 50 units of product.

Therefore it is socially desirable to have a single firm providing the service because the cost of production is lower (2<3). The problem is not the existence per se of a monopoly, but rather to deter the single firm from monopolically exploiting the consumers by fixing the price equal to its marginal income rather than equal the long-term marginal cost.

In this respect, the existence of economies of scale and of scope in the provision, maintenance and operation of infrastructure drives towards the study of the classical monopoly, graphically described as:

GRAFICA

In particular, the natural monopoly phenomenon, explained primarily by economies of scale, implies that when tariffication at marginal social cost takes place (since average costs are above marginal costs), the firm cannot finance its investments, and the operations cannot be carried on unless the state provides a subsidy in order to allow the monopolist zero economic income or to allow non-linear tariffication of the type fixed cost + variable cost.

An answer to this problem is to abandon the desire to reach an optimal first-best solution and seek an optimal second-best solution. An alternative is to seek the a socially optimal tariff, which minimizes the loss of economic efficiency due to choosing a second-best solution but subjecting the monopolist to obtain financing. This approach has been denominated Ramsey's efficient tariffication and is based in the calculation of prices for each type of roadway user as a function of the inverse of price elasticity. In both cases, the primary difficulty of marginal cost tariffication lies in knowing the correct function of costs of providing roadway services.

2.2 *Rate of Return Regulation*

Rather than fixing prices in relation to long-term marginal costs, where demand equals the long run marginal cost, the regulator could fix the tariff to the average plus a "reasonable" profitability margin. In this case, what is "reasonable"?

Tariff fixing by means of a “reasonable” rate of return establishes that the benefit to the monopolist will be zero when the profitability is accounted by using a rate of return on capital (s) greater than the cost (r) of using that capital (k). This way, the benefit obtained by the monopolist is positive but smaller than the benefit he would obtain in the absence of a regulatory scheme. The system is inefficient because it induces the monopolist to use K beyond its economic cost so as to obtain the rate s>r, which is the only way in which he could increase his economic benefit. This is known as the "Averch- Johnson" overcapitalization effect.[4] If the regulator counts with complete information on the project, this effect can be eliminated.

2.3 Application of Price Cap Regulation in Infrastructure

It is possible to combine within the general planning of a project the design of a tendering scheme with a selected regulatory scheme. This approach is important under the *Price Caps* method or RPI-X mechanism. In this respect, if the regulator decides to plan the project as a function of baskets of prices and to dynamically regulate it through an X factor, these elements provide the regulator with an implicit tool for the adjudication of the contract.

Specifically, it is possible to adjudicate the contract according to the ponderers of the basket of goods and or the factor X itself. Following the English regulatory scheme, the *Price Caps* or RPI-X method consists in the following:

i. The regulator directly establishes the maximum prices (caps) that the monopolist can charge for the services it provides.

ii. These maximum prices are defined for a basket of services provided by the monopolist.

iii. These prices can be defined by an index of prices or may be expressed as a function of a single price.

iv. The index of prices is periodically adjusted by a factor that is exogenous to the regulated firm. This adjustment factor is the inflation (RPI) minus X, where X is associated to a relevant variable (such as demand and/or costs as indicated previously)

v. At intervals of 3 or 4 years, the adjustment factors, the definition of the basket, and the price pondering schemes, are adjusted.

This method has the following advantages with respect to regulations based on the rate of return:

---

[4] Averch H. , Johnson L. (1962) ¨Behavior of the Firm Under Regulatory Constrain¨, American Economic Review, Vo 52.

i. It is less vulnerable to the "additional cost" of inefficiency, since prices decrease over time.

ii. There is no overcapitalization effect and no inefficient use of productive factors.[5]

iii. It provides the firm with a greater flexibility to adjust the structure of prices within the basket.

iv. It is simpler to implement both for the firm and the regulator.

v. It is more transparent and better focused on the relevant consumer's parameters.

In order to determine a level X, it is suggested to examine the following:

i. Future traffic flows growth.

ii. Capital financing calendar.

iii. Possibility of additional commercial income.

iv. Possibility of diminishing costs and increasing productivity.

2.4 New Economics of Regulation

One of the most dynamic branches of microeconomics is Economy of Regulation. There exists three theoretical developments on that have transformed the way to cope and analyze the regulation problems posed by the focus on public interest, and have proven to be quite helpful in assessing market situations where the competition paradigm does not hold. These developments are:

Economics of information, which has allowed the explicit incorporation of information asymmetry problems that exist between regulators and regulated firms, thus advancing in the design of contracts and incentive mechanisms to minimize problems. Information asymmetries might be a result of "private" information in the hands of regulated firms, and unknown to the regulator, with respect to a non-verifiable exogenous variable (such as a technological or productivity parameter) adding-up to an adverse selection situation, such as moral hazard.

Transaction Costs Theory, which is associated with Coase and Williamson's (1985) findings. The crucial argument of this theory is that given the existence of transaction costs, it is very costly to design complete contracts. Williamson refers to four types of such costs, two of which occur before subscribing the contract, and two that occur once the contract is outstanding: the first two relate to contingencies that can not be foreseen, and in case they are, it is very difficult to include them all in a contract; the second two are

---

5 Averch Johnson effect

result from the excessive costs that monitoring and auditing a contract can represent. Consequently, it should be expected for contracts to be incomplete.

Game Theory, which has allowed the analysis and explicit modeling of strategic interactions that take place between rational agents, such as firms that participate in an oligopolic market, or regulators and regulated firms.

Theory of Regulator Capture, which intends to explain the tendency of government intervention in different industries. As mentioned before, two main focuses have been proposed in this respect: a) public interest theory, where the role of the government in correcting market imperfections is stressed, and b) private interest theory or capture, where regulatory agencies face information restrictions and are not regarded as maximizers of public welfare. The capture theory underlines the role of interest groups in the crafting of public policy.

2.5 Regulation and Institutionalization

One of the main problems that countries must face in defining its regulatory schemes is to adequately diagnose the framework under which such schemes are to be implemented. This is crucial, because even though it is possible to define theoretically acceptable regulatory schemes, in practice many of them fail when implemented.

To regulate is difficult and costly. Hence countries should first try to execute more inexpensive and efficient policies as an alternative to direct regulation, such as the promotion of competition, in order to attain a better allocation of resources.

Competition policies should be broadly defined, not to be limited to antimonopoly legislation. Therefore, competition policies could be generically defined as what the State does (or does not do) to deepen markets and maximize the sum of economic surpluses of producers and consumers. Defined as such, competition policies not necessarily translate into the promotion of participation of a greater number of operators, but rather in an increase of consumer welfare.

The country-specific context determines the manner and degree in which institutional autonomy of the regulatory agency can be attained. Two closely linked elements describe the legal context under which companies operate and the requirements imposed on the regulatory agencies: design of the law and its enforcement.

A sound law design requires a simple text to be easily understood, not subject to pressures leading to its frequent modification, and consistent with generally accepted principles. A simple legislation can be more effective in attaining the relevant objectives that it pursues. Complex legislation can result from the desire of introducing far too many objectives in a law, many of them inconsistent with each other. Simplicity reduces the pressure to burocratize its implementation and minimizes chances for corruption.

2.5.1 Contract Regulation and Supervising Activities

Regardless of the institutional organization of the regulatory agency, it is crucial for the regulatory agency to have as its central objective ensure the compliance with the accorded contract and to scrutinize the correct implementation and quality of the infrastructure project.

Accordingly, the minimum standard functions of a regulatory institution are:

a) Contract supervision;
b) Evaluation of engineering designs, studies and specifications for the project.
c) Enforcement of specifications and technical norms in the constructions activities;
d) Control the compliance with the activity plan proposed by the regulated firm;
e) Control the regulation of security measure;
f) Manage the compliance with quality norms;
g) Revise and assess statistic information provided by the regulated firm.

In addition, the regulatory agency should:

a) Approve, reject and suggest modifications to the original time schedules, projects and other documents presented by the regulated firm for which the tendering norms require approval. In this respect, the approval of any project or document does not entail any responsibility to the regulator, hence responsibility on the design and quality of the construction should be assumed entirely by the regulated firm;

b) Reject construction materials that do not comply with the specifications detailed in the contract.

c) Stop construction works in the cases where projects have not been approved yet, or if they were been executed in contravention of approved specifications.

d) Propose the application of corresponding penalties in observance of the concession contract:

Upon completion of the construction works:

a) Monitor the compliance with technical norms for the conservation of the infrastructure

b) Approve conservation programs

c) Control the compliance with the schedule of activities

d) Enforce compliance with the technical norms on the operation of public works;

e) Supervise fulfillment of agreed tariffs;

f) Control observance of economic conditions determined under the tendering bases;

g) Propose the application of penalties in the case of non-compliance;

3 FINANCIAL REGULATION

Financial Regulation is the utilization of a series of financial and economic techniques and tools on the part of the State. Its objective is to maintain stable the relationship between risk and expected return, throughout the maturity of the contract,. Financial regulation should be incorporated in the contract since the very beginning in the request for proposals (RFP) and/or in the PPP agreement by means of two procedures:

a) on the risk side, throughout a series of clauses and/or covenants that specify the measures and define the responsibilities of the concessionary entity, along with the design of guarantees provided by the State; and
b) on the return side, in the definition of the life-span of the contract, the tariffs scheme (absolute and relative levels of tolls depending on type of vehicle and its adjustment formula over time), the time schedule and investment program, and the definition of adjustment mechanisms in the case where the risk-return relationship becomes unbalanced during the time length of the contract.

3.1 Financial Economic Equilibrium of the concession (FEE)

Financial regulation is closely related to the definition Financial-Economic Equilibrium (EFE), which is the upholding of a targeted profitability (e.g. rate of return) on the part of the conceding party in benefit of the concessionaire. The targeted profitability is the financial engineering included in the bidding document which is reflected in a mathematical model that is structured according to standard parameters associated with investment valuation.

The model, and thus the target profitability, can be known by the conceding party throughout the extent of the contract if it was established in the tendering bases and evaluated in the tenders presentation. In this case, the financial regulation should uphold stable both the risk and the expected return all through the duration of the contract.

Alternatively, both the model and the targeted profitability of the concessionaire may not be explicitly known by the conceding party throughout the duration of the contract. In this case, the financial model and targeted profitability may only be known (or guessed) implicitly by the conceding party when agreements between the two parties are negotiated in relation to contractual modifications leading to compensations to the concessionaire. In this case, the financial regulation should uphold stable only the risk level of the contract, throughout the duration of the contract, given an expected profitability known only to the concessionaire.

3.2 Risk-return Relationship

A basic principle in finance is the existing relationship between the risk assumed in a given project and the expected return from such investment. The total risk has two components which are known as systematic risk and non-systematic risk. The systematic risk is an endogenous factor that is not under the control of the investor, and reflects the sensibility or volatility of the expected return on the project in relation to the overall market; in other

words, it is an elasticity measure that determines how changes in the economy affect the profitability of the project.

This type of risk is measured by means of a factor denominated Beta (β), which is the covariance between the profitability of the project and that of the overall market, divided by the variance of the overall market.

On the other hand, the non-systematic risk is an endogenous factor to the project, and which is susceptible of being controlled through diversification. It plays an important role in the financial and operative leverage that can be achieved by the firm.

In this respect, a public works contract can be analyzed as a project with cash flows with given expected returns and risks.

In general, the profitability of a project E(Rp) is defined in the Capital Asset Pricing Model (CAPM) as:

$$E(Rp) = Rf + \beta b \times (Rm - Rf)$$

Where Rf is the risk-free rate of return, Rm is the return of the overall market, and βb is the marginal contribution to the portfolio risk of the project.

Alternatively, this equation can be rewritten as:

$$E(Rp) = Rf + \beta b \times PR$$

Where PR is the risk premium and is defined as $R_m - R_f$.

A modification to this model for countries with high country risk implies the modification of the traditional CAPM model. This modification is denominated "Zero Beta CAPM"[6], where, instead of employing the risk-free rate of return and zero variance, a risky rate of return with minimum variance is used given the conditions of the country. This change entails adding up to the standard risk free rate a term that reflects a risk-premium according to country risk.[7] This approximation is detailed in section 2.5 of Hinojosa (2001) PDF.

3.2.1 Business design in public private partnership arena under a consistent risk return context

In many occasions, either because of public welfare reasons, economic policy, or unwillingness of users to pay, the possibility of raising tariffs is not available, furthermore if there appears a price elasticity that leads to a decrease in the total income of the project. This restricts a contract from applying apply a tariff acceptable from both social and private standpoints.

On the other hand, the time term of projects is usually limited by the present value of the cash flows, in the sense that long terms (over 30 years) marginally contribute little to the

---

[6] Also known as two-factor model

[7] The incorporation of country risk in the CAPM model has been suggested by "Infrastructure in a Market Economy", Kennedy School of Government, Harvard University. Case Study Sequel (2000).

present value of the project. Moreover, extension of terms over 30 years obstruct the possibility of financing projects by means of fixed income instruments, because their trading is very limited.

Finally, the state contributions are available only in limited sums, and are difficult to politically defend when they are directed to increase the private profitability of a project, much more when these funds could be rather used in other socially sensible sectors, such as education or health.

Therefore, the key question is how to design a project contract in a risk-profitability context, assuming that the project is socially profitable, that its risk is high, and that management of variables such as tariffs, time terms, and state contributions are not feasible instruments. The response implicitly applied in contract schemes has been a public-private partnership PPP based on sharing the risks entailed by any given project. This way, the conceding party (the State, ministry or state agency) reduces the β of projects by directly assuming the risks that cannot be diversified by the private sector.

An example on a methodological proposal for the hypothetical estimation of the expected returns under the Zero Beta CAPM model is provided in section 2.5 of Hinojosa (2001) PDF: Revision of State of Art Contingent Liability.

3.3 Financial Regulation when the State is acquainted with the financial model and the target rate of return of the concessionary

The underlying concept in a public works contract is the allocation of project risks in the agent better prepared to cope with them. Therefore, this should be the central element orienting the necessary adjustments to the financial model in order to reestablish the Economic and Financial Equilibrium (EFE). This objective is pursued by clearly and precisely differentiating: a) between the concepts of Real Firm (RF) and Model Firm (MF), and b) between the risks to be allocated in the RF and MF, while meticulously observing the dispositions defined in the legal body of the contract.

> *Real Firm (RF)*: it is the regulated enterprise (not the promoter enterprises nor the parent company). It is the enterprise that assumes the responsibilities established in the contract. It takes the respective risks and receives in exchange a remuneration. In legal terms the real firm is the Special Purpose Vehicle.
>
> *Model Firm (MF)*: it is understood as the instrumental virtual company established by the RF in the tender process. The MF is translated into a mathematical cash flows model, whose dynamic structure depend over time on the specified and assigned risks defined in the contract. The MF obtains during the extension of the contract a profitability exactly equal to the profitability reported in the bidding process, which must be upheld throughout the length of the contract. The MF also defines the compensations associated with the materialization of the risks assigned in the contract.

The distinction above has the objective of allowing the involved counterparts to separate those risks that are assigned to each one of them. Therefore, if the Economic and Financial Equilibrium (EFE) is based on fixing a determined profitability, the adverse events affecting the RF, and which are the responsibility of the concessionaire, must not be compensated by the State.

Given the definitions mentioned above, it is possible to express the effective profitability of the RF as:

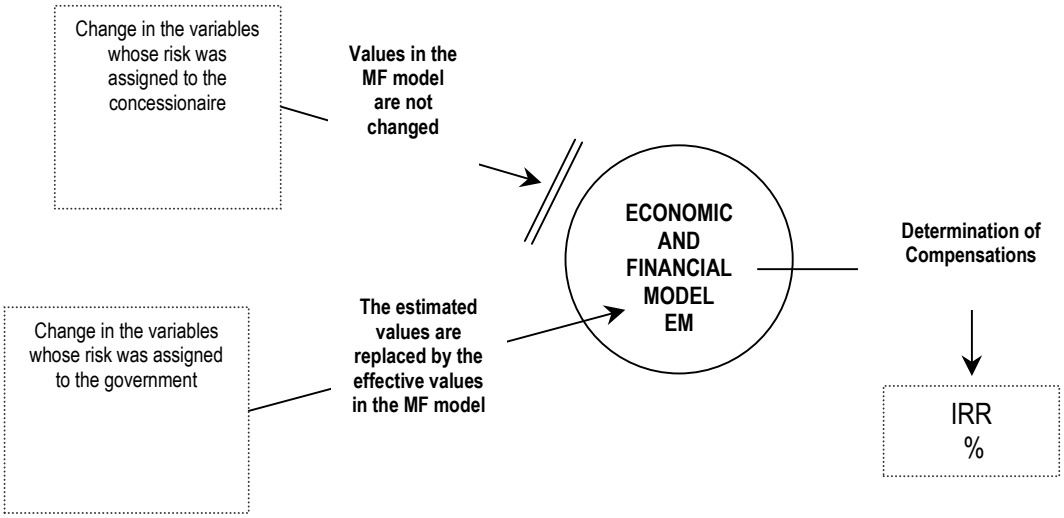
$$IRR_{RF} = f\left(IRR_{MF}, \varepsilon\right)$$

Where IRR_{RF} is the effective profitability of the real firm, IRR_{MF} is the profitability of the model firm, which should be upheld throughout the lifetime of the contract, and ε is a random variable equal to the difference between the effective and projected values of the project, for those variables that correspond to the risks assigned to the concessionaire.

For instance, if the traffic risk is assigned to the concessionaire, and the effective value of the traffic is greater than the value projected in the bidding process, this will contribute to a greater ε . If on the contrary, the effective traffic is exactly equal to the projected traffic, ε will tend to zero.

3.3.1 Effects of Risk allocation between Real Firm and Model Firm

As expressed previously, the MF incorporates effective values of those variables corresponding to the risks assigned to the conceding party. This isolates the risks assigned to the firm from the risks assigned to other agents, therefore facilitating the determination of the exact compensation required to immunize the RF from the risks that have not been assigned to it, and simultaneously avoiding to compensate the RF for risks that were effectively assigned to it.



Thus, some of the systematic risks (risks that can not be controlled), are removed from the MF and assigned to the state or directly to the users of the infrastructure project. Consequently, the removal of this systematic risk must be considered as a factor in the determination of the expected profit of the contract. In the case of the non-systematic risks, these are entirely assigned to the RF given the intuition that they can be diversified away.

As an illustration, assume the existence of a contract where the inflation risk is assigned to the user and to the state, by readjusting the tariff every once in a while. The risk is assigned to the user, because it will be him who will ultimately pay a higher tariff if inflation is high, and to the state, because it will have to pay the political costs associated with authorizing higher tolls on conceded roadways. Thus the firm should be compensated for this risk when the effective inflation is greater than the inflation assumed in the bid. This is expressed in the incorporation of the effective inflation values in the MF, which in turn affects other variables within the model, such as investments, other costs and the tariffs. The resulting change upholds the IRR at its fixed level.

An opposite example would be the case in which the demand risk has been assigned to the concessionaire. Should the traffic flows drop, no compensation should take place. Consequently, in the MF the traffic variable should not be altered. Otherwise, the model would signal a compensation that would not be proceeding according to the terms of the contract given the fact that demand risk was originally assigned to the firm.

In summary, the effective values of those variables that correspond to risks assigned to the state should be incorporated in the model in order to determine in the MF the compensations that should take place. On the contrary, those variables that correspond to risks assigned to the concessionaire should be kept fixed within the MF, since no compensation is to be determined.

3.4 Financial Regulation when the State is not acquainted with the financial model and the target rate of return of the concessionary

There exists a broad criteria for the reestablishment of the economic and financial equilibrium of a contract in the face of situations affecting it. It is known as the reestablishment of the profitability of the project.

The objective of this approach is to modify the financial and economic conditions of the project, after the occurrence of endogenous or exogenous events affecting these conditions, so as to ensure that the project exhibits again the profitability level that it enjoyed under the original conditions at the time of adjudication.

In order to do attain this objective, it is necessary to reproduce the evaluation of the project performed during the tendering process, including the values for the variables that defined the adjudication. In general, the evaluation performed by the concessionaire will not be available to the State, which will result in a negotiating process between the State and the concessionaire where each other's model profitability results will be compared for particular events affecting the economic and financial equilibrium.

The inconvenience of this process is that the concessionaire will be in an advantageous position to conceal the positive effects that may be generated over the project's profitability, and will simultaneously have the instruments to request compensation for events for which do, or do not, proceed a compensation.