Highway concessions in Brazil: an analysis towards the feasibility of the securitization

CLAUDIO T. ALENCAR[1]

Company and Enterprise Management Group of the Building Industry, Department of Construction - Escola Politécnica da Universidade de São Paulo

Summary

▪ In this paper, comes out an analyses of the feasiblity of securitization of highway concessions in Brazil. Principally, we seek to identify the highway construction budget and the traffic volume necessary to render securitization feasible as a possibility for funding a prototype concession.
▪ Our analysis relies on information provided by the main federal highway concessions under way in Brazil. The conclusion is that, under the present situation of Brazilian economy, it is possible to securitise the prototype concession, yet its implemetation relies on the fall of prevailing interest rates in Brazil.

Keywords: concessions, securitization, highways, economic analysis, privatisation

Introduction

Currently, Brazil is trying out a new model for developing its infrastructure sector and exploiting related projects. The Brazilian government has previously acted as the investor and main developer of infrastructure projects. Now it is transferring this role to private entrepreneurs, through concessions or permissions.

According to (Estache and Carbajo, 1996), the adoption of this alternative model has two well defined purposes. First, transferring certain tasks of the state to other agents in society, will release funds formely earmarked for such tasks. Secondly it is expected that alternative model will result in efficiency and quality gain.

In the new model, it is proposed that concessions should be preceded by a bid and that, during the whole concession period, the grantor (Government) will monitor the quality of the service rendered through regulating agencies, see (Rigolon, 1997). (Irwin and Alexander, 1996) state that for this model to operate appropriately, the dynamics of the domestic capital market and its relationship with the international capital market is very important. In several countries, institutional investors have been the preferential fund providers for infrastructure projects. This is due mainly to the possibility of matching the cash flow of enterprises in the area, which is intense and concentrated in the investment period, compared to that of the return period, which is long and generally steady, with the profile characteristic of investment funds managed by institutional investors.

However, the presence of sufficient funds to commence a specific project does not guarantee its continued funding. It is necessary to analyse

---

[1] Address: Av. Prof. Almeida Prado - Travessa 2 No.83, 05508-900 Cidade Universitária, São Paulo - SP - Brazil

the project's economic characteristics and compare them with other investment alternatives in the investor's portfolio, (So and Shin, 1995). Project funding is available only when the project's characteristics are more attractive than those in the private investor's portfolio.

The objective of this paper is to identify the traffic volume and construction costs conditions as well that are necessary to attract funding of these projects by private investors in Brazil. Another important point investigated in this study is the appropriateness of the expected securitization process. Securitization provides funding for the project via the selling securities bound to the highway concession. Security buyers receive returns on invested capital from a fixed interest rate and/or from a variable one, based on the revenue generated by the enterprise.

To summarise, the main goal of this paper is to identify the necessary conditions to attract investors to a highway concession in Brazil, given that securitization serves as the underlying funding process.

Principles of economic analysis

The analysis of the economic characteristics of undertaking typically relies on the relationship between the amount of funds required to introduce the enterprise (INVESTMENT), and the revenues generated from its exploitation (RETURN). In this analysis, risks associated with the investment and exploitation of the undertaking must be simulated. Hereby risks are treated as deviations in the variables associated to investment and return, from adopted reference scenarios. These deviations can drastically affect the economic characteristics assumed in the reference scenario.

Such an economic analysis is based on a simulation process that attributes values to a financial flow associated with the development and wage of the undertaking. This simulation process typically involves the following steps:
- setting up a reference scenario in which the behaviour of variables related to the

economic performance of the enterprise is estimated;
- creating a mathematical model that represents the relationships among the variables and, in this way, is able to generate an expected financial flow related to the enterprise;
- drawing conclusions regarding the economic characteristics of the undertaking from the simulated cash flow, which allow for the identification of the volume and the timing of investments that the enterprise requires in addition to the period and the amount of revenues it is able to create under reference scenario conditions;
- undertaking a risk analysis, which involves a variation in the behaviour of the variables set up in the reference scenario. Such a variation modifies original investment and return positions, resulting in a worse economic performance of the enterprise. The degree of deviation in the financial flow due to a given variable shows how susceptible the financial flow is to this variable. If a small variation in a group of variables cause great deviations in return, the undertaking has low support capacity; on the other hand, if great variations generate small deviations, the undertaking has a high support capacity.

The basic structure of this simulation process can be described as follows: in order to perform economic analysis, there must be a structured simulation instrument called model. This model has to be manipulated by setting up several prototypes of behaviour for the undertaking. Hence, each simulated prototype can be understood as a different virtual undertaking with different economic characteristics.

In this study, it is important to assemble a prototype, or to simulate a virtual highway concession because in the context of feasible securitization, the enterprise is supposed to be able to generate return on invested capital compatible with its risks and this generation depends on the traffic on the privatised highway.

Highway concessions in brazil

In general, concession laws have been introduced in several countries to provide for project developments while granting concessionaires adequate returns. The main objective of concession laws can be understood as the establishment of an environment as competitive as possible, in which projects are financed privately which provide services compatible with user expectations.

The requirements for a competitive environment are: well structured specific legislation and regulatory agencies. Two aspects of Brazil's conccession legislation are of particular importance in that context: the invitation to bid and the concession contract. The bidding will be decided by one of the following criteria: the lowest toll to be charged; the highest offer in the case of payment being received by the government; a combination of the two approaches. The concession agreement is the legal instrument that regulates the obligations and rights of the government, concessionaire and users when the concession is introduced.

A private bidder will take into account a number of factors including the concession object, the period during the investments program would take place, the highway renovation and technological upgrading that would precede the toll collection, toll adjustment, highway operation parameters and expenses involved in the bid. The attractiveness of the highway concession is highly dependent on traffic volume and its expected growth rate. These variables are correlated to:

▪ the intensity and nature of the current economic activities in the area where the highway is located and the cities it connects;

▪ the existence of alternative routes to service the targets users of the origin and the destination of the granted highway;

▪ the existence of alternative transport facilities between the origin and destination;

▪ the development of new technologies of transportation.

THE PROTOTYPE[2]

In this study, the model used to analyse the economic characteristics of highway concessions was predicated on the rules promulgated by the General Brazilian Law of Concessions. Consequently, our model is in compliance with the general conditions foreseen in the General Law of Concessions prevailing in Brazil, but is not necessarily transferable to other context.

According to these rules, it is very important to define the stages of the concession program, their duration and the financial flow expected in each stage. The concession is made up of two main stages: the bid or preconcession and the wage of the highway. The bid involves meeting the conditions that will qualify the bidder as concessionaire. The wage of the highway is divided in two overlapping phases. The first involves renovation and technological upgrading or even construction. These activities are foreseen both in the invitation to bid and in the concession agreement. The second phase involves the operation and administration of the highway, per se, aiming at maintaining the quality of the rendered service and the period of toll collection, according to the concession agreement.

THE PRECONCESSION STAGE

Any company taking part in a bid will have to provide funds in order to pay legal and enviromental expenses and pay for consulting services, the grantor and other costs. The total cost involved in this stage derives from the nature and object of the concession, total investments needs and contractual obligations.

THE CONCESSION AGREEMENT

The concession agreement is the legal instrument that regulates government,

---

[2] All information used in this prototype was obtained from the BR 290 Osório – Porto Alegre highway concession.

concessionaire and user obligations and rights. The condition for the exploitation of a utility by the private sector is generally the concessionaire's commitment to make investments in functional improvements (costly concession) when the service already exists, or to develop the entire enterprise on which the service is based on when is does not, which is the case of the BOT (built, operate and transfer) system. In addition, the contract may involve the fixing of a payment. In both cases the concessionaire is rewarded by the toll collection in a specific period. When this exploitation period is over, the concession can be renewed by a new public bidding.

The attractiveness of the concession to investors will be dependent of *economic characteristics x associated risk* binomial, which will derive in large measure from contractual rules. If rigid contractual rules are established to safeguard grantor and users interests, such rigidity tends to harm the attractiveness of the concession to private investors. In other words, more flexible contractual rules can improve the attractiveness of a project to investors; however, they can be harmful to those utilising the service.

Any analysis that explores the economic characteristics of the securitization of highway concessions and its associated risks will have to start adopting a prototype and an economic scenario, considering contractual aspects and macroeconomic projections. Through these assumptions, the financial flow related to the undertaking (or concession) can be simulated. This will typically include the effect of the inflation on the financial flow, from the preconcession stage to the end.
Furthermore, the concession agreement will give additional information regarding the cash flow via clauses refering to suitable service, user and grantor rights, toll policy and available sources of revenue.

ARBITRATED ECONOMIC SCENARIO

Our economic model include the currency used in the analysis (in this case the Brazilian currency – the real R$), the adjustment index adopted, factors influencing the financial flow, such as:

- preconcession costs;
- renovation and technological upgrading costs;
- operation and maintenance costs;
- revenues derived from toll collection.

Other elements included in the economic scenario are the expected inflation rate and a minimum rate of return for the concessionaire. In this paper, the financial flow is adjusted following the variation of the IGP (General Index of Prices) calculated by Getúlio Vargas Foundation – Brazil. Others factors, such as the toll revenue are assumed to follow the evolution of real purchasing power, which is associated with the inflation rate during the entire period of the concession.

THE EXPLOITATION OF THE HIGHWAY

In the exploitation stage, there are costs related to renovation to improve traffic conditions on the highway. Other costs brought upon the concessionaire at this stage are operation and maintenance expenses, which are dependent on the performance projected for the granted highway. Revenues are available from the start of toll collection should also be included here.

BUDGET - RECOVERY AND IMPROVEMENTS

The highway construction budget can be estimated choosing an account plan that contains the costs associated to the mobilisation for production, earthmoving, paving, drainages, special bridges, monitoring systems and user information and backup. Even in the account plan, there ought to be costs associated to construction management.

The estimated costs, expressed in the domestic currency, can vary intensely according to

geographical features and quality of the soil of the area where it will be built.

The disparity of values among the costruction costs, estimated by DERSA (Departamento de Estradas de Rodagem de São Paulo - Road Department of the State of São Paulo), and other Road Departments in Brazil express the relevance of detailed information in estimating construction costs. DERSA's estimation for highways construction cost is around 2 million R$ per kilometre, while others have estimated it between 350 and 400 thousand R$ per kilometre.

OPERATIONAL COSTS

In this prototype, the costs associated with the operation and management of the highway during the concession period are based on costs related to structuring and operating systems that allow the concessionaire to offer services in compliance with concession agreement requirements. These requirements follow the General Law of Concessions in Brazil. Thus, the following costs must be estimated for the adequate offer by a concessionaire:

- general management costs;
- operational costs;
- maintenance and conservation costs;
- insurance and warranties;
- monotoring costs.

In addition, the creation of a fund for investments for the replacement of assets has to be taken into account. The magnitude of this fund corresponds to the volume that the entrepreneur ought to periodically invest in order to maintain the level of revenues generated by the enterprise[3].

EXPECTED TRAFFIC

The main revenue in exploiting a highway is the toll collection. Therefore, an assessment of

---

[3] The deterioration of the highway and its inevitable functional obsolescence produce a decrease in revenue. The reversion of the decrease is only possible with new investments.

the traffic volume that will flow through the highway is of vital importance for estimating the exploitation revenue. In spite of the fact that the Brazilian concession legislation permits the commercial exploitation of separate sides of a highway, this hypothesis is not taken into consideration in this paper.

(De Chiara, 1996) has suggested that there is a positive correlation between the level of economic activity and the traffic volume. According to him, "the transportation of people and cargo from one place to another depends on the development of other economic activities within a given society".

THE BASIC TOLL

The Brazilian Law of Concessions establishes the rules for the charging of the tolls. As long as the concession is authorized, the contract can include mechanisms for toll adjustments in order to mantain the originally intended financial balance whenever the loss of that balance is caused by variables related to factors, which cannot be controlled by the concessionaire and whose behaviour may deviate a great deal from the initial proposal.

If there are not disturbances that justify toll adjustment, this will occur in annual cycles according to the formula given in the contract. Usually, the toll adjustment of highway concessions is based on a basket of indexes related to its main construction costs.

In our model, the basic toll was based on the average value provided by the successful proposals for concessions of federal Brazilian highways (about 0.03 R$ per kilometre). For São Paulo's highway concession program (Ferreira, 1997) has identified tolls reaching 0.035 to 0.040 R$ per kilometre. For purposes of the analysis here proposed, the toll was settled at 0.03 R$ per km.

Multiplying the expected annual traffic volume by the toll, the annual gross operational revenue generated by the highway can be projected. The gross operational result can be calculated, by

---

deducting inflationary losses and related expenses (taxes and financial interests) by the gross operational revenue.

The revenue level should be compared to payment demands arising from the securities that will support the investments. A summary of the financial flow related to the concession prototype is presented in table 1.

The securitization of the concession

(Stebbings, 1995) defines the securitization as a system where a group of assets is converted into fixed yield bonds, which are sold to investors. Accordingly, as securities are negotiated in the capital market, the company will attract funds to make investments or acquire liquidity for the assets, which would otherwise be fixed.

Securitization implies the creation of debts for investors. The capability to pay the incurred debt is dependent on the revenue generation capability of the assets that were converted into securities. According to (Henderson and Scott, 1988) minimum requirements for securitization are:

- a clear understanding of the credit characteristics;
- well defined payments rules/identifiable cash flow;
- assets with maturity of at least one year;
- low default and overdue payment rates;
- total amortisation;
- a variety of obligations;
- high liquidation value.

Among others, the following assets meet those requirements: real estate mortgages, automobile financing, credit cards receivables, computer and truck leasing, commercial transactions receivables, investment fund shares, real state investment trusts, general enterprises in the building industry sector, etc.

(Rocha Lima, 1995) emphasises that the securitization system should be able to safeguard the assets from market fluctuations. The securitization process of any asset starts with the creation of a Special Purpose Company (SPC). The SPC is created to segregate risks associated to a specific enterprise from systemics risks involved in other operations developed by its originator. In other words, the SPC is created to isolate an enterprise from the risks inherents to other operations in the originator's portfolio. Thus, securitization can be understood as a discreet operation with a risk contour contained within its own performance, which is not related to that of the organization that develops it.

According to (Ferreira, 1995), a vigorous growth in securitization in Brazil facilitates new patterns for the financing companies and enterprises, focused on capital markets instead of credit markets. Some authors believe that this is due to advantages provided by the securitization system, such as:

[i] - financial cost reduction;
[ii] – capital market expansion;
[iii] – security appreciation;
[iv] - more transparency in asset value;
[v] – the establishment of a secondary market;
[vi] - greater efficiency in drawing funds from lenders to borrowers;
[vii] - tax expense reduction.

Table 1 Financial flow during the concession

Classification	Total (R$ thousand)	Period (year)	Annual average (R$ thousand)
Preconcession costs	(2912)	0 - 1	(2912)
Recovery/improvements costs	(72800)	2 - 5	(18200)
Operational costs	(312800)	2 - 22	(14895)
Taxes	(54587)	3 - 22	(2729)
Financial expenses	(59278)	3 - 14	(4940)
Securitization expenses	(8624)	2 - 22	(411)
Gross operational revenue	713553	3 - 22	35678
Gross operational result	202552	3 - 22	10128

In Brazil, securitization has been developed, especially in real estate, and more recently, in utility concessions, with a strong focus on securities of variable income, characterized as debentures. Specifically, securitization of enterprises in the building industry has been made feasible by the issuing of securities of two types:

1) the public offering of subordinate debentures whose gains are composed of a portion of fixed income, identified by a guaranteed interest rate, and of a portion of variable income, linked to the enterprise's performance. These are offered to investors and pose smaller risk;

2) the private placements of subordinate debentures, destined to the shareholders of the SPC, responsible for developing the enterprise. Its gains depends on the performance of the enterprise. All fluctuations in returns must be absorbed by them; therefore, it is natural they should have higher profitability than those of public offerings.

This system of financing enterprises has been described as "project financing" or "project finance". In project finance credit is guaranteed by the cash flow of the enterprise and its contractual basis. (Finnerty, 1998) and (Ferreira, 1997) suggested that the most important advantage of this system is the splitting of risks among all participants of the enterprise.

In this paper, the securities bound to the concession are divided in two categories: equity debentures (EDEB) and subordinated debentures (SDEB), according to their involvement in risks, funding requirements for the enterprise, as well as, facilitating their negotiation in the capital market. The EDEBs must absorb all the risks of the concession, whereas SDEBs have much better defined risks.

EQUITY DEBENTURES - EDEB

EDEBs are given to SPC shareholders, as compensation of investments that they make in a highway project. EDEBs have variable earnings equivalent to profit sharing in 100% of the Availabe Operational Earnings (AOE)[4] generated by the concession.

Thus, during the concession period, EDEBs receive, all of the AOE generated by the enterprise, which serve as their earnings and amortisation. Once the AOE volume annually distributed during the concession period is identified, it is possible to obtain the internal rate of return associated to EDEBs by relating the volume of AOE distributed to the volume of EDEB given to and paid for SPC stockholders.

In the model presented, the volume of EDEB is equal to the costs linked to the preconcession period. However, depending on the format of the EDEB emission, which is related not only to grace period but also to amortisation rules and interests payments, deficits can be generated in the global cash flow of the concession. In this case, the deficits will have to be compensated for creating more EDEBs.

As far as the risks inherent to the undertaking are concerned, we assume these to be absorbed, exclusively by EDEBs. In case deviations from the reference scenario cause worse economic performance of the enterprise, the SDEBs will not be affected, but the EDEB profitability will.

EDEBs are placed for simultaneous subscription, in a sole annual tranch to be paid up in cash. They are supposed to cover the preconcession costs and the eventual cash flow deficits. Their face value is adjusted annually according to the IGP variation.

SUBORDINATED DEBENTURES - SDEB

SDEBs are floated in public offerings; they have fixed earnings plus na element of profit

---

[4] The Available Operational Earnings (, which remunerate the EDEBs according to the percentual collected) are obtained by deducting operational costs, the fund for investments for the replacement of assets and EDEB charges, interest and principal, from the gross operational result.

sharing in the gross operational revenue[5] of the enterprise. The fixed earnings plus the variable earnings derived from the revenue must be competitive with other assets that are offered in the market.

The SDEB emission can assume varied configurations as regards the proportion of fixed and variable earnings in the total earnings of the security. A larger proportion of fixed earnings denotes a smaller participation in the risks associated to the enterprise. A larger proportion of variable earnings will, on the contrary, be more vulnerable to the risks of the enterprise. The SDEB volume is related to recovery and tecnological upgrading costs. SDEBs are placed in four tranches, for simultaneous subscription, to be paid in four annual payments, in compliance with the investment requirements in the same period. Their face value is adjusted annually according to the IGP variation.

We assume that SDEBs receive a fixed interest rate, equivalent at 10% a year, on the face value of each tranch, from the month following each payment until the date of their amortisation. They also receive variable earnings equivalent to 5.1% of the exploitation revenue. The redemption of each tranch, with a 2 year grace period, is scheduled to be made in 8 equal payments adjusted annually in agreement with the IGP variation.

INDICATORS OF ECONOMIC QUALITY

The economic characteristics of EDEBs and SDEBs can be summarised in terms of the Internal Rate of Return and Pay Back indicators. The Internal Rate of Return expresses the investment's capacity to produce a certain level of wealth, see (Rocha Lima, 1995).

The Pay Back indicates the period that the enterprise needs to recoup invested funds. It can be calculated in two ways: simple Pay Back,

which measures the period for recouping the investment capacity, and the Pay Back, based on an atractiveness rate that would remunerate the funds if they were invested in an operation whose risk pattern is similar to that of the enterprise under analysis.

For EDEBs, the Internal Rate of Return (*TRP*) will be the one that satisfies the expression:

$$\sum_0^a \frac{I_k}{(1+TRP)^k} = \sum_b^n \frac{R_k}{(1+TRP)^k} \text{, where} \qquad (1)$$

I_k = payment value in a certain year of order k;

R_k = return value, as payment of interest, amortisation, or both, received by the investor (concessionaire or partners of the SPC) in a certain year of order k;

TRP = internal rate of return associated to the investment;

0 = moment of the first investment payment;

a = moment of the last investment payment;

b = moment of the first return payment;

n = moment of the last return payment.

For the SDEB Internal Rate of Return, the expression is also valid, substituting (*TRP*) for (*TRI*).

Table 2 shows the financial flow related to both types of securities, EDEBs and SDEBs. Figure 1 display the corresponding Internal Rate of Return and Pay Back positions. The Internal Rate of Return is important for investors because indicates the leverage of the invested funds only at the end of the operation, whereas the analysis of the profile of its formation describes the evolution of this leverage, period by period.

Risk analysis

The characteristics of the EDEB and SDEB described in the previous section were based on the reference scenario. However, the reference scenario does not mean providing foresight of the future, but only a reliable hypothesis of behaviour.

---

[5] Not in the result because SDEBs will be subscribed by investors that do not have the ability to manage risks associated to the highway exploitation bussiness.

Table 2 Security issue program

Type	Payment (R$ thousand)	Period (year)	Redemption (R$ thousand)	Period (year)	Earnings (R$ thousand)		Period (year)
					Variable	Fixed	
EDEBs	6736	1	6736	22	198728	3824	3 - 22
SDEBs	14560	2	1820	4	1498	1425	3
	25480	3	5005	5	1528	3919	4
	25480	4	8190	6	1558	6235	5
	7280	5	9100	7	1589	6458	6
			9100	8	1621	5656	7
			9100	9	1654	4765	8
			9100	10	1687	3875	9
			9100	11	1720	2984	10
			7280	12	1755	2093	11
			4095	13	1790	1202	12
			910	14	1826	489	13
					1862	89	14
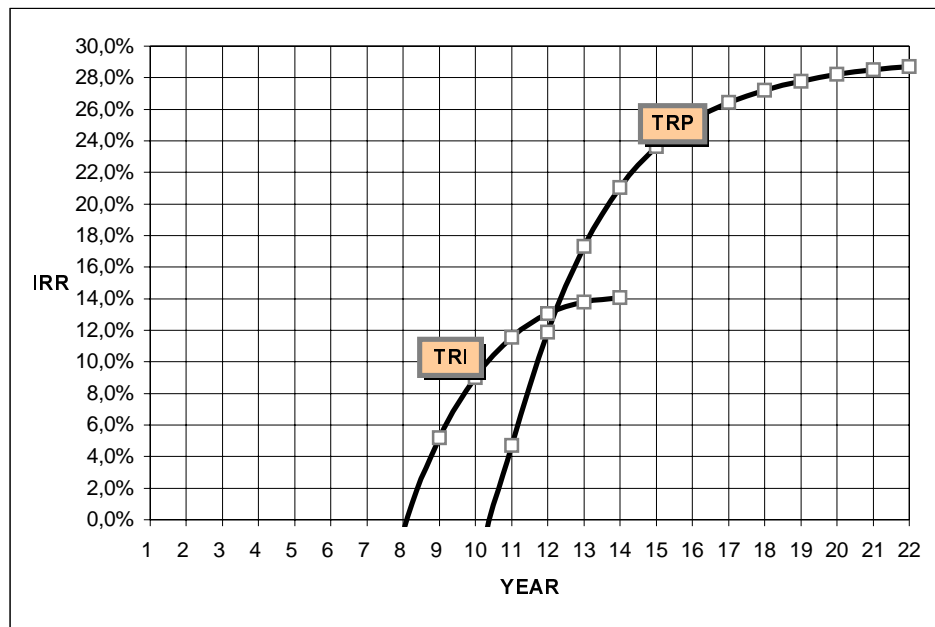
Figure 1 – TRI, TRP and Pay Back

Consequently, budget (recovery and improvements) increase and traffic volume break down will be analysed regarding to the impact on the Internal Rate of Return (IRR) of both, EDEB and SDEB. In relation to macroeconomic aspects, fluctuations on the inflation rate and its impact on the EDEB and SDEB IRR will be simulated. The following figures show these impacts.

BUDGET INCREASE

To analyze how a budget increase impacts on the IRR, a budget variation from R$ 728,000/km, the position on the reference scenario, up to R$ 827,000/km was introduced, as seen in Figure 2.

TRAFFIC VOLUME BREAK DOWN

To analyze how traffic volume impacts on the IRR, the following figures were considered: an initial traffic volume decline from 100,000 vehicle-equivalent/km/year, the position on reference scenario, to 95,500 vehicle equivalent/km/year, together with a traffic growth rate variation from 2% a year to 1%. This results in the impacts as seen in Figures 3 and 4.

INFLATION RATE FLUCTUATION

The impact of inflation rate fluctuation was analyzed in a probalistic way, due to its unpredictable behaviour. In this analysis the inflation rate can vary randomly between imposed borders (1% - 8% annually). Thus, each inflation rate position (51) randomly generated indicates different IRRs for SDEBs and EDEBs. In this approach it is possible to build an IRR reliable sample and to extract its confidence interval of 95%, using the formula, $\overline{X} \pm 1.96(\frac{\sigma}{\sqrt{n}})$, where, X is the average, σ is the standard deviation and n is the number of elements of the sample. The figures 5 and 6 show us these efects:

Conclusions

The securitization of the prototype highway is feasible as long as the EDBEs and SDEBs can satisfy both SPC shareholders and capital market investors, according to the configuration of profitability and risks related to them. Accordingly, under the reference scenario conditions, EDEBs have a Rate of Return of roughly 28% a year and simple Pay Back, of 11 years, whereas SDEBs have an IRR of 14% a year and Pay Back of 9 years. Accordingly, indicators of economic quality associated to the investment in EDBEs indicate great feasibility, for, when compared to the economic indicators of other infrastructure enterprises in Brazil, their performance is above the average in the sector. As far as SDEBs are concerned, their distribution in the capital market is affected, although not rendered unfeasible, by the prevailing level of interest rates, which is the basis for the earnings the Brazilian government offers bondholders, roughly 19.5% a year, there being no possibility of drawing a parallel between this situation and that of the London LIBOR or the American Treasury Bonds, two of the main references in international markets. Nevertheless, as basic interest rates gradually decrease, the competitiveness of SDBEs will gradually increase. As far as risks associated with investment in EDBEs and SDBEs are concerned, it can be stated that, in both cases, the risk profile does not seriously affect their competiteveness since. According to the analyses performed, a decrease in enterprise performance expressed in a budget increase, together with a decrease both in traffic volume and its annual growth rate lead to patterns of profitability of lesser quality, but acceptable, even so. The same can be inferred from probabilistic analyses of inflation rate fluctuations during the concession period.
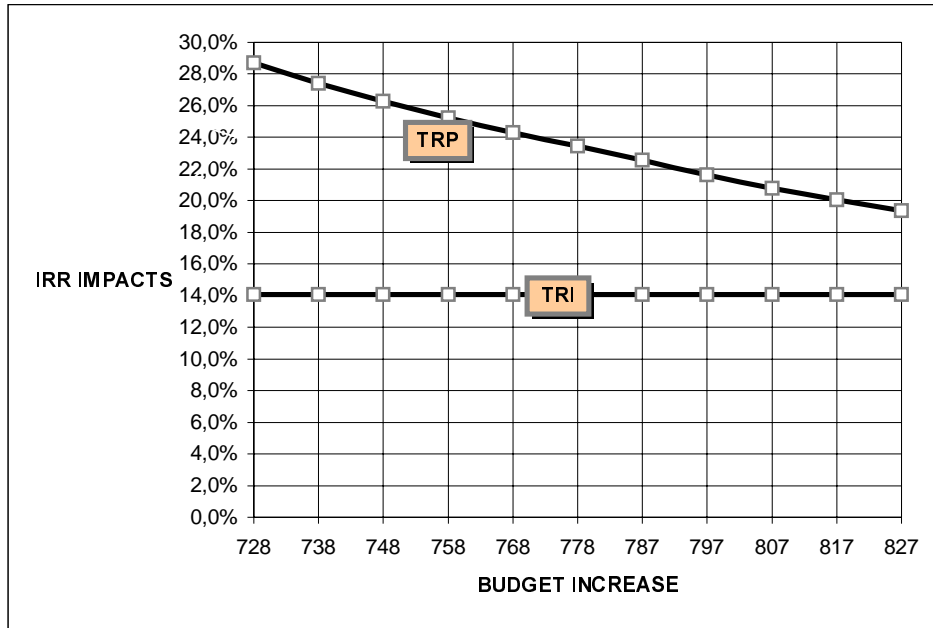
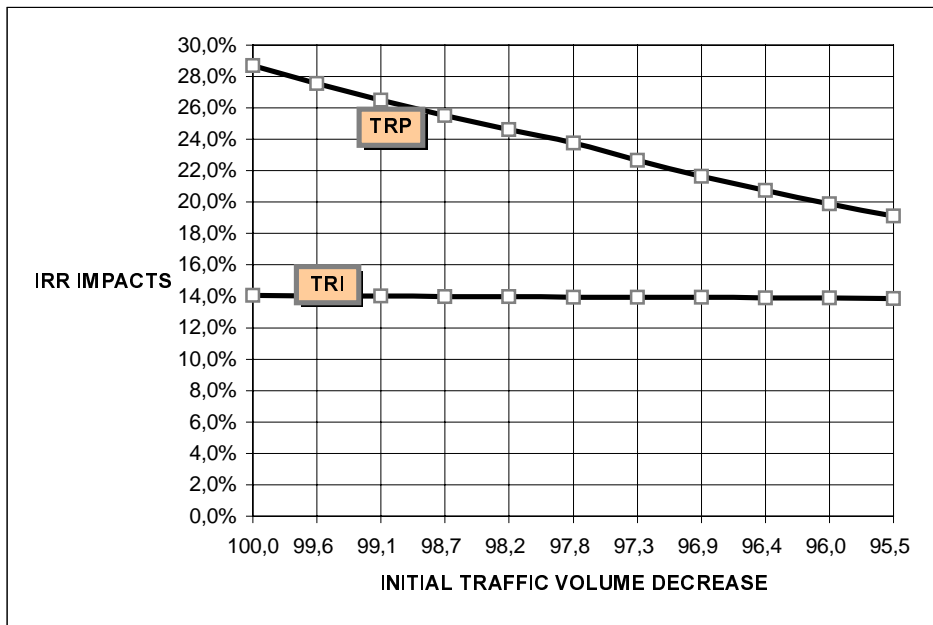**Figure 2 – Budget Increase versus TRI and TRP**

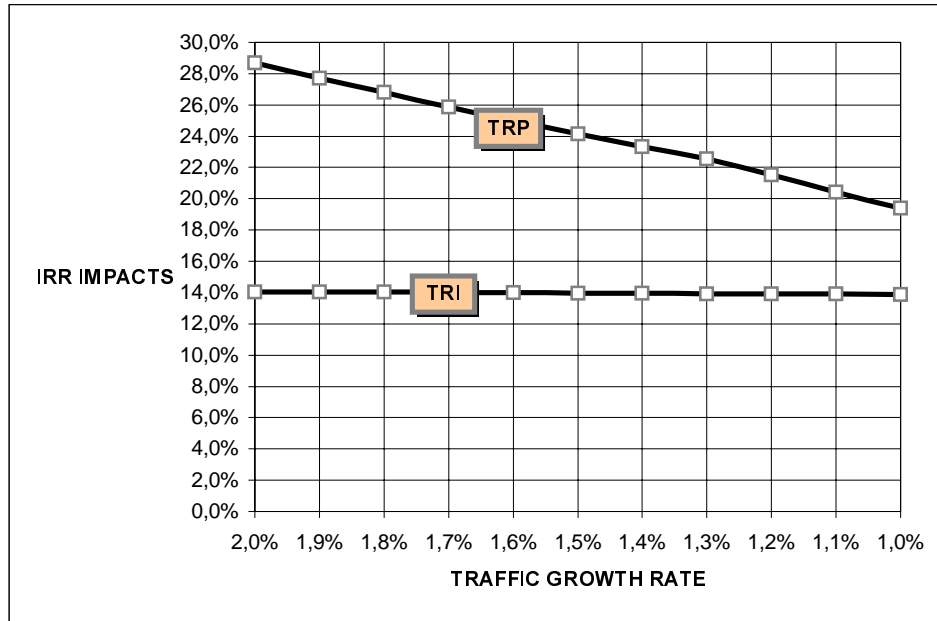**Figure 3 – Initial Traffic Volume versus TRI and TRP**

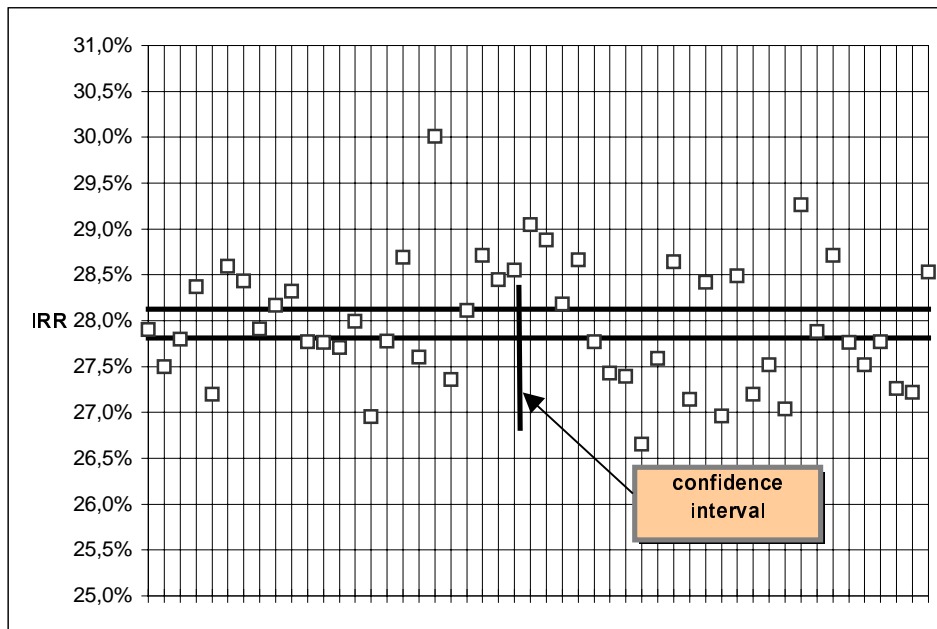**Figure 4 – Traffic Growth Rate versus TRI and TRP**

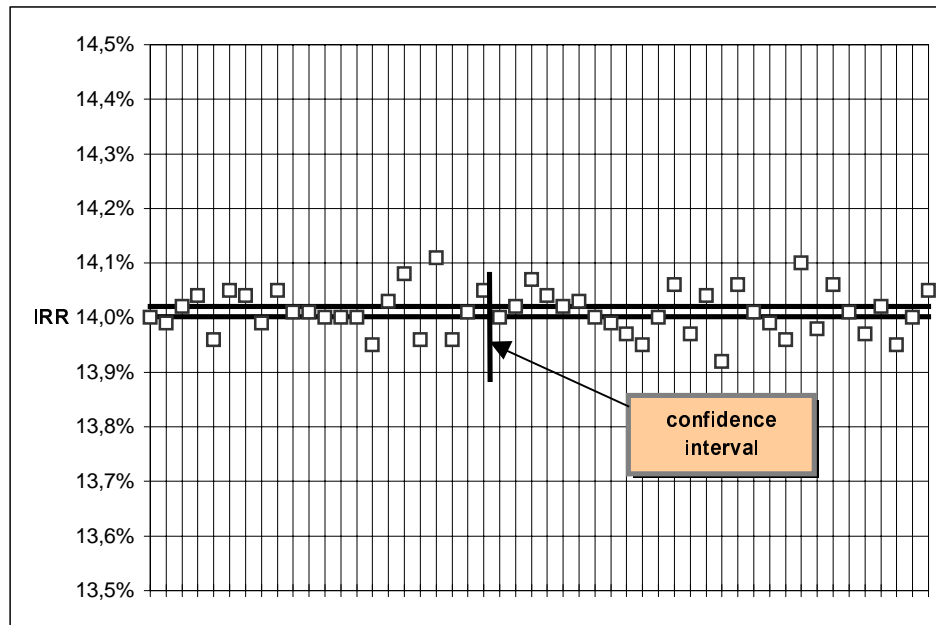**Figure 5 – The EDEB IRR confidence interval**

Figure 6 – The SDEB IRR confidence interval

References

De Chiara, P.C. (1996) Highway Concessions Economic Analysis: the President Dutra Case, MSc dissertation, Department of Construction, Polytechnic School, University of São Paulo, São Paulo, Brazil.

Estache, A. and Carbajo, J. (1996) Designing Toll Roads Concessions - Lessons from Argentina, The World Bank, Public Policy For The Private Sector, No. 99, p. 1-4.

Ferreira, C.K.L. (1997) Privatisation and Concession Programs: evaluating cases in Brasil and in São Paulo, Building Industry Economic Studies, Vol. 2(4), p. 63-126.

Ferreira, C.K.L. (1995) Financing Industry and Infrastructure in Brazil: Long Term Credit and Capital Market, Ph.D Thesis, Institute of Economy, Campinas State University, Campinas, Brazil.

Finnerty, J.D. (1998) The Project Finance System. Qualitymark, Rio de Janeiro.

Henderson, J. and Scott, J.P. (1988) Securitization, New York Institute of Finance Corporation, New York.

Irwin, T. and Alexander, I. (1996) Privatizing Infrastructure: Capital Markets Pressures and Management Incentives, The World Bank, Public Policy For The Private Sector, No. 87, p. 8-12.

Rigolon, F.J.Z. (1997) Regulating Infrastructure: the new experience in Brazil, National Bank for Economic and Social Development Review, Vol. 4(7), p. 123-150.

Rocha Lima, J. (1995) Building Industry: Fundamentals of Financial Planning, Technical Paper No. 11, Department of

Construction, Polytechnic School, University of São Paulo, São Paulo, Brazil.

Rocha Lima, J. (1993) Real Estate Securitization, Technical Paper No. 99, Department of Construction, Polytechnic School, University of São Paulo, São Paulo, Brazil.

So, J. and Shin, B. (1995) The Private Infrastructure Industry: Company Approaches, The World Bank, Public Policy For The Private Sector, No. 49, p. 1-4.

Stebbings, R.Y. (1995) The Global Alchemy of Asset Securitization, International Financial Law Review, p. 12-16.