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**USE OF BOND ISSUES TO CAPTURE FINANCIAL SURPLUS GENERATED
FOR THE PRIVATE SECTOR BY PUBLIC INVESTMENTS IN TRANSPORT
PROJECTS: BRAZILIAN LEGISLATION**

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ABSTRACT

It is widely known that the capitals market is a major source of permanent financial resources for the economy because of the connection it establishes between agents with savings capacity (investors) and those in need of long term financial resources (finance borrowers). That being so, this paper presents a study on the possibility of capturing the financial surplus generated for the Private sector by public investments in transport projects using financing instruments, specifically, bonds. Such a study is needed to provide supporting information for new investments in transport projects given the scarcity of financial resources in a considerable number of Latin American countries. The analysis undertaken considers the Brazilian Capitals Market as a case study and

accordingly the concepts used in it are presented in the perspective of Brazilian legislation.

INTRODUCTION

It is widely known that the capitals market is a great source of permanent resources for the economy because of the connection it establishes between agents with savings capacity (investors) and those in need of long term financial resources (finance borrowers). That financial mechanism can be applied to financing transport projects especially projects that bring in positive results for the production sector and society that are economically measurable by the size of financial surpluses

This paper presents a study on the possibility of capturing the financial surplus generated for the Private sector by public investments in transport projects using elements of financing, specifically bonds. Such a study is needed to provide supporting information for new investments in transport projects given the scarcity of financial resources in a considerable number of Latin American countries.

The analysis undertaken considers the Brazilian Capitals Market as a case study and accordingly the concepts used are presented in the perspective of Brazilian legislation. In the approach adopted for this study an investigation is made into the application of government bonds, private bonds and securitisation as a way of raising, *a priori*, the resources needed to finance transport projects. Valuing or estimating the worth of such bonds is achieved according to the results brought in by the transport projects (additional surpluses) and the costs

The paper has been divided into 6 sections including this introduction. Section 2 sets out the concept of financial surplus and the impacts that a new transport project has on it. In Section 3 there is brief review of the function of the capitals market, highlighting the concept of bonds and bonds and their economic function. Section 4 contains a review of Brazilian practices in the use of bonds to finance transport projects. Based on the reflections presented in the preceding sections, section 5 presents an analysis of those bonds that are suitable for use in the capture of financial surpluses generated for private sector by public investment in transport projects. Lastly, Section 6 sets out the final remarks and delineates the challenge of developing the idea being put forward in the paper.

CONCEPT OF FINANCIAL SURPLUS AND ADDITIONAL SURPLUS GENERATED BY A TRANSPORT PROJECT

Pindyck and Rubinfeld (2006) describe financial surplus as the difference between the negotiable value of a given quantity of a product supplied and/or consumed and the estimated value of that same quantity. The surplus is divided into two portions, the surplus of the consumer and the surplus of the producer (Pindyck and Rubinfeld, 2006; Vasconcelos and Oliveira, 2000; Varian, 2006).

Aldigueri and Rocha (2008) offer a more detailed explanation of the concept of surplus and present it in the form of graphs as a function of supply and demand curves and the market price and later they analyze how a transport project can generate additional surplus.

In the view of Taaffe *et al.* (1996), Cervero (1998), Ballou (2001), Orrico (2005), Vasconcelos (2007) and Aragão (2008), transport is a fundamental element of any productive chain. Litman (2002) lists the possible impacts that a transport infrastructure project may generate as follows: (i) improvement of transport system accessibility and mobility; (ii) increase in overall economic productivity; (iii) generating income (macro-economic analysis); (iv) increases in the safety and reliability of transport activities; and (v) reduction in transport costs and a consequent reduction in production costs.

Lima Neto (2006) and Pamphile *et al.* (2008) discuss the lateral contributions that a transport project makes in raising real estate values and creating new land use opportunities (economic activities) that were formerly unfeasible or unattractive to the private sector.

Aldigueri and Rocha (2008) make a preliminary demonstration of how a transport project creates additional surpluses in those sectors of the economy, basing themselves on the impacts and results mentioned above. Accordingly those results will be the focus of the capture of negotiable values in the form of bonds or bonds applied in the capitals market, and used for financing transport projects which in turn give rise to the said results.

A mathematical model is presently being developed (Aldigueri, 2008), to enable those overall, additional surplus amounts stemming from transport projects and their re-negotiation among the beneficiary entities, to be estimated and that is one of the major challenges of this approach.

This paper however does not limit itself to the question of estimating and renegotiating the surpluses but goes on to address the second stage, which involves a theoretical trial of the use of bonds in capitals markets to capture the surpluses generated by transport projects and their financing.

FINANCE: CAPITALS MARKETS

Various authors have declared that the capitals market is a major source of permanent financial resources for the economy because of the connection it establishes between agents with savings capacity (investors) and those in need of long term financial resources (finance borrowers) (Lopes *et al.*, 2007; Ross *et al.*, 1995; Santos, 2006; Sharpe, 1974).

According to Lopes *et al.* (2007), the capitals market offers long term and medium term financing to meet the needs of the economic agents, as for example in the issuing of bonds/bonds. It also offers financing with unspecified time limits such as actions involving share issues.

In turn, Santos (2006) states that the development of the capitals market is fundamental to enabling companies and the public sector to gain access to private third party financing for its investment projects. Therefore the instruments being studied here are public and private bonds and the process of securitisation, that first appeared in the 20th century as an alternative way of capturing financial resources for investment purposes irrespective of whether the resources are public or private.

Bonds

One of the ways that companies currently obtain resources to finance their investment activities involves the sale or “issuing” of bonds (Ross *et al.*, 1995). In the respective literature, bonds are referred to as financial instruments or rights and can be classified as third party capital or autonomous capital or more loosely, as shares or obligations.

The bonds may be fixed yield or variable yield. Variable yield bonds are calculated using an established base rate (as for example the interest rate of treasury bonds) plus an added margin (Garcia and Salomão, 2006). Fixed yield bonds are so called because their yield is governed by pre-established rules and therefore known in advance (pre-fixed interest rate) opt they may be indexed to the exchange rate or the inflation rate, the bank rate, the GNP and so on.

Public Bonds

In accordance with the definition put forward by Santos (1971) and adopted in this paper, public bonds are those issued by legally constituted entities and are directed at raising funding in the private sector to be used in meeting public sector needs. They are in fact, loans obtained by the State from society at large and constitute pecuniary obligations payable in accordance with the terms stipulated in them.

Gonçalves (2004) described public bonds as fixed yield assets that represent a good investment option for society and they are endowed with the primary purpose of capturing resources to finance public debt and to finance the activities of the federal Government such as education, health and transport infrastructure.

RISK OFFICE (2005) in its paper on Brazil gave an example of the use of bonds created by the Brazilian government for the purpose of raising financing for its projects. That study reports how the Federal Government, in order to capture resources from the financial market and especially from investment funds, created a new kinds of bonds

that function as instruments for capturing resources in the capitals market. Those new instruments could strengthen the bridges between the financial sector and agribusiness.

Private Bonds

In Brazil, private bonds are issued by private financial institutions and open capital companies. One of the private bonds in use in Brazil is the debenture. It is used primarily to capture financing in the capitals market. Borges and Lopes (2001) emphasize that debentures can be issued by means of private or public distribution and in that case it is common to use the term debenture subscription.

Lopes *et al.* (2007) state that debentures are long or medium-term debt bonds issued in Brazil by open capital companies that confer on their holders the credit rights over the issuing company. When they are the object of public distribution, a modality that is exclusive to the open capital companies, they are regulated by the *Comissão de Valores Mobiliários* – CVM, and eventually by the Brazilian Central Bank

Lopes *et al.* (2007) also point out that the economic function of a debenture issue is that of a loan obtained by capturing resources directly from the public investor and the process may or may not be intermediated by a financial institution. The participation of financial agent that is not a subscriber to the issue means that it is a mere broker of the issue or it may be acting as the representative of a third party in the operation.

Bonds backed by securitisation

Together with direct obligation and credit derivatives, securitisation is one of the main credit instruments currently available on the Brazilian financial market. Unlike the other two however, securitisation enables primary assets to be transformed into negotiable subordinate units. According to Galdi *et al* (2006), the term securitisation was coined by Lewis Ranieri. Securitisation is derived from security and thus it refers rather to a process than to any specific kind of financial asset.

Securitisation is the term used to identify operations in which the value issued is in some way backed by or bound to credit rights, also known as receivables. An expectation of some kind of return becomes a receivable when there is some legally established relation to back it, thereby giving rise to a contract or a credit bond.

There are several reasons that justify securitising the financing of working capital, among them: (i) need for cash in hand; (ii) the convenience of early liquidation of a certain loan which if maintained would result in higher financial costs than those offered by securitisation; (iii) improved appearance of financial demonstration sheet; (iv) in the case of financial institutions, there may be a need to comply with the asset requirements set out in the Basle Agreement; and (v) the transformation of non-liquid

credit into a security with a negotiable value and endowed with liquidity (see Rocha and Britto, 2008).

In regard to the structure of a securitisation operation, the process involves quite ordinary agents and processes though each structure will inevitably be customized to address the specific needs of the originator institution (Rocha and Britto, 2008). The process requires the participation of agents and intermediaries that are in a position to issue negotiable bonds as can be seen in the illustration below (Figure 1). The main agents involved are:

- Originator: the financial agent holding the assets that serve to back the bonds issued.
- Issuer (or securitising agent): the agent responsible for acquiring the primary assets from the originator and issuing the negotiable bonds.
- Investors: entities that invest funds in the bonds offered by the issuer.
- Intervening parties: are those agents that play specific roles that contribute to the securitisation process such as: rating agencies responsible for attributing a risk classification to the issued bonds; independent auditors responsible for accounting and fiscal aspects; the trustee, responsible for protecting the rights of the investors; the custodian, responsible for the process of selecting assets and ensuring the quality of the Securitised portfolio; and legal advisers.

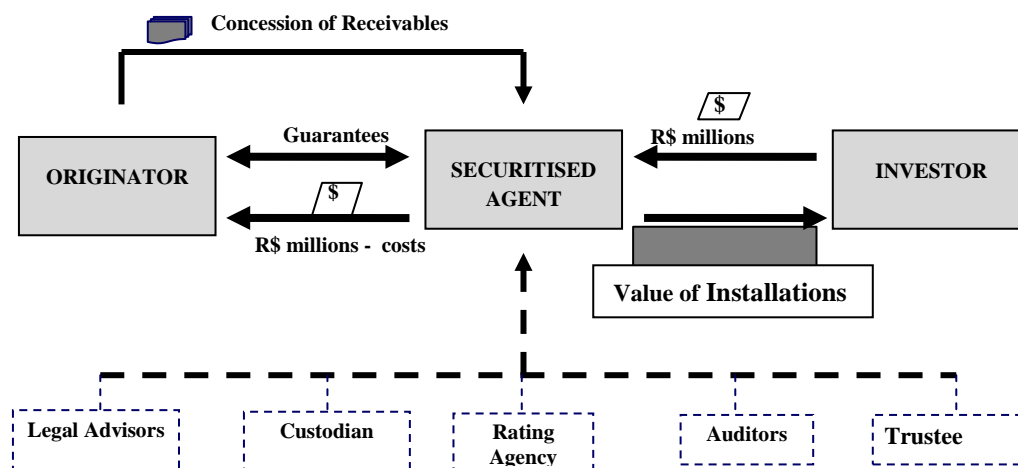


Figure 1: Basic Scheme for the Securitisation of Receivables

Source: Rocha and Britto

Another important agent is the custodian who is responsible for looking after the creditors' interests especial in the issuing of negotiable values, that is to say the custodian is responsible for administering the resources and interests of third parties.

The main functions of the custodian in securitisation operations are: monitor the conduct of the administrators of the institution issuing the negotiable papers; (ii)

centralize the necessary resources for paying for the bonds; and; e (iii) taking whatever steps are necessary to ensure that the negotiable bonds placed on the market are paid back punctually, on their due dates.

FINANCING TRANSPORT BY BOND ISSUES

This section makes a brief review of the Brazilian experience in the use of bond issues to finance projects, particularly transport projects. That use is portrayed as means of raising the necessary resources to implant a project by means of prior negotiation of those bonds that in fact correspond to the project and its expected results – lower transport costs, greater accessibility and mobility (Litman, 2002), increased real estate values (Lima Neto, 2006 and Pamphile *et al.* (2008), regional integration and economic development (Taaffe *et al.*, 1996; Ballou, 2001; Vasconcelos, 2007; Aragão, 2008) and financial surpluses (Aldigueri e Rocha, 2008).

Unlike the effects of using fiscal instruments that only allow for the amortization of the funds allotted to a project after it has been implemented, as a means of renegotiating the results of the project (Costa, 2009), the use of bonds is capable of anticipating the acquirement of the necessary resources on the basis of an expectation of future results (expected cash flows).

Brazilian practice

In Brazil, bonds are financial instruments that offer the promise of a certain pattern of payments spread out over a determined period. The Bonus is a specific type of bond and can be issued by companies and by governments. It is a way of borrowing money whereby the borrower, – the government or a company – promises to pay a fixed amount (C) of monetary units (coupon) over a certain period of time up until a certain date (T) which is referred to as the maturity date when the face value (F) will be paid to the holder of the Bonus (Brealey and Myers, 1998; Brigham and Houston, 1999; Ross *et al.*, 2007). The flow of payments associated to a bond of the Bonus type is represented in Figure 2.

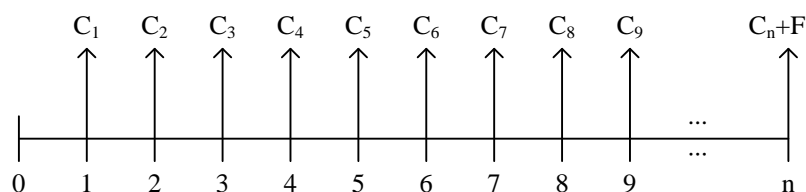


Figure 1: Time ruler of payment flow associated to Bonus

In that regard, the Brazilian government has been using bonds to obtain financial resources for the purpose of investing in infrastructure. An outstanding case in the transport sector was the construction of an urban toll-paying expressway in Rio de Janeiro using private capital obtained by issuing bonds and offering them on the capitals market (Aragão, 2006).

In the sphere of securitisation, the form commonly observed in Brazil and indeed, peculiar to it, is the issuing of bills known as '*duplicatas*' that are a kind of credit bond and constitute an instrument that proves the existence of a sale and purchase contract. Debentures or commercial papers are also commonly used (shares, debentures, beneficiary parties, subscription bonuses, derivatives of negotiable values).

Rocha and Britto (2008) examine securitisation of the leasing of port areas and installations. The authors point out that securitisation operations make it possible to associate credit rights over future cash flows to ordinary financial assets and obligations. According to the authors, in the case of ports, the credit rights are generated by the leasing of the port areas and the securitisation of the future cash flows from the lease of port areas and installations is an alternative source of financial resources for the public sector.

ANALYSIS OF THE BRAZILIAN LEGISLATION ON BOND ISSUING TO FINANCE TRANSPORT PROJECTS

In this section an analysis is made of the real possibility of issuing bonds to capture part of the financial surplus generated in the private sector by public investments in transport projects. The objects of analysis are: (i) public bonds in the form of zero coupon-type Bonuses, e (ii) securitisation, which involves the issue of private bonds like shares, debentures, beneficiary parties, subscription bonus, negotiable value derivatives and commercial papers. The securitisation process is highly important to this study in that it uses the issuing of private bonds to capture financial resources in the capitals market.

The zero coupon Bonus is a public bond that is more suited to financing future investment projects, in this case, in transport infrastructure (Brealey and Myers, 1998; Brigham and Houston, 1999; Ross *et al.*, 1995). Such Bonuses do not pay annual interest but are instead, sold at below face value eventually offering the investor capital gains.

In the capturing of the financial surplus generated in the private sector by public sector investments in transport projects, it is suggested that the Bonuses that are issued be referred to as 'investment management bills' - IMB.

The zero coupon Bonus will pay a face value F a certain number of years from now T where T is always a higher number than the number of years for the beginning of financial surplus in the private sector to be registered.

The zero coupon bonus referred to here has three features: first, the income received from it in the form of capital gains should be taxed; second, the direct and indirect beneficiaries of the investment in transport infrastructure are obliged to deposit, every year of the useful life of the undertaking an annual amount equivalent to a part of the financial surplus generated by each agent provided that the economic environment remains favorable that is to say a surplus is in fact generated; third, the payment of the

face value of the Bonus must be backed by: (a) the flow of part of the private financial surplus generated by the undertaking, and (b) by the remuneration of the special purpose account which will receive the amounts levied on the capital gains; and fourth, the Bonuses can be freely negotiated in the Capitals Market.

An analysis of how securitisation is used reveals that typically, in the operations involved, the negotiable assets that are issued are backed by or bound to some form of credit rights or receivables. Revenue that stems from the expectation of a result becomes a receivable when there is an established legal relation to back it, giving rise to a contract or a credit bond.

Another form of securitisation is the process whereby the cash flow produced by the receivables or assets is transferred to another company (in this case it is usually directed more at working capital operations) specially set up for the purpose, and they are used to back the public or private issue of bonds or bonds (or negotiable values) that represent an ideal fraction of the total assets involved. For that reason it must be noted that the use of securitisation to capture part of the financial surplus and re-invest it in transport is coherent but it needs to be explained in greater detail. Securitisation operations need to guarantee: (a) to the originator, that the rates charged on the captured funds are lower than the yield rates from the investment projects being implemented; (b) to the investor, a return on investment compatible with the presumed degree of risk; (c) to the securitiser, that the flow of receivables is sufficient to cover the payment on the due dates of the coupon amounts (coupons are the nominal interest amounts specified in a debt agreement) and the principal in addition to covering the costs of the operation and the respective mark-up.

It must be borne in mind that the securitiser is entitled to issue bonds corresponding to the receivables involved and place them on the market. Those requirements must be met in the securitisation of investment projects where it is suggested that the Government should capture financial resources for new investments in transport.

Securitisation operations are conducted in a context of risk and uncertainty. The flow of receivables becomes dependant on the whether the economic environment is favorable or unfavorable and the respective probabilities of one of those two situations prevailing. For the purpose of this study, a favorable or unfavorable environment means whether there is any occurrence of private sector financial surpluses or not.

Another point that must be stressed is that the uncertainty surrounding the returns from securitisation makes it possible for investors to buy and sell securitisation bonds in the capital market thus making securitisation a venture just like any other that is negotiated in stock exchange with the reminder that securitisation operations usually involve an institution that is the originator of the receivables, a securitising organization, and investors and added to those, a trustee and the respective governmental regulatory bodies.

CONCLUSIONS

The growing demand for transport services in Brazil and around the world has created a need to constantly seek for alternative forms of financing that can provide support to the Public sector in providing such services. That is because the public sector has insufficient financial resources available to meet the demand.

Accordingly the focus of the paper has been on the capture of private sector financial surpluses engendered by investments in transport which are made in the public interest. The study starts by embracing the idea of various authors like Contador (1988), Miller (1981) and Varian (2003), that the financial surplus can be estimated by the variation in profits. Although economic literature pays little or no attention to the issue it can be concluded that there do in fact exist financial and non-financial ways of capturing such surpluses. The amounts effectively captured should be used to invest in the transport sector.

Given that situation, the study set out to make a critical analysis of the mechanisms of the financial economy, particularly public or private bonds that are considered to be susceptible to being used in such capture.

The critical analysis made of the mechanisms of the financial economy in the perspective of the relevant Brazilian legislation made it possible to identify securitised private bond issues and public bonds as elements that could be used in the capture of financial surpluses. It was suggested that a type of Bonus could be created for that purpose that would have all the properties of the suggested mechanism. In the case of securitisation, the details of the process itself were presented and it was suggested that private bonds should be used in the process namely: shares, debentures, beneficiary parties, subscription bonuses, derivatives of negotiable values, and commercial papers.

On the basis of the analyses set out in the study the following recommendations for future work in the field of financing transport with a focus on the capture of financial surpluses are now made:

- Appraisal of the instruments for capturing financial surpluses considering their economic efficiency, something not touched on in the present work.
- Design and develop a methodology that can be used to identify the area of influence of the implantation of a transport project highlighting the production chains that such projects encompass. That is necessary because the theme has not been the object of any attention in this paper but is nevertheless highly important in enabling the capture instruments to perform in the way that is expected of them.
- An analysis was made of the public and private bonds used to capture the financial surplus generated in the private sector by public sector investments in transport projects and accordingly it is recommended that various models for capturing financial surpluses should be identified and analyzed and a comparison made among

them to see whether they bring in the same results as the individual elements when they are used separately.

- Design and develop a methodology that can be used to calculate the amount of the financial surplus that is engendered in the private sector by public investments in transport projects so that those calculations can be included in the social evaluation of transport projects
- Assess the impacts that capturing the financial surplus that is engendered in the private sector by public investments in transport projects may have on the government treasury.

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