



# SELECTED PROCEEDINGS

## COMPARATIVE ANALYSIS OF THE RISKS INVOLVED IN FEDERAL HIGHWAY CONCESSION CONTRACTS

NILSON CORREA GONZE EMAIL FOR CORRESPONDENCE: NGONZE@PET.COPPE.UFRJ.BR

NILSONGONZE@YAHOO.COM.BR

PROGRAMA DE ENGENHARIA DE TRANSPORTES (TRANSPORTATION ENGINEERING PROGRAM)UNIVERSIDADE FEDERAL DO RIO DE JANEIRO, RIO DE JANEIRO, BRAZIL

RÔMULO DANTE ORRICO FILHO EMAIL FOR CORRESPONDENCE: ROMULO@PET.COPPE.UFRJ.BR

PROGRAMA DE ENGENHARIA DE TRANSPORTES (TRANSPORTATION ENGINEERING PROGRAM)UNIVERSIDADE FEDERAL DO RIO DE JANEIRO, RIO DE JANEIRO, BRAZIL

This is an abridged version of the paper presented at the conference. The full version is being submitted elsewhere.  
Details on the full paper can be obtained from the author.

ISBN: 978-85-285-0232-9

13th World Conference  
on Transport Research

[www.wctr2013rio.com](http://www.wctr2013rio.com)

15-18  
JULY  
2013  
Rio de Janeiro, Brazil

unicast

# COMPARATIVE ANALYSIS OF THE RISKS INVOLVED IN FEDERAL HIGHWAY CONCESSION CONTRACTS

Nilson Correa Gonze

Email for correspondence: [ngonze@pet.coppe.ufrj.br](mailto:ngonze@pet.coppe.ufrj.br); [nilsongonze@yahoo.com.br](mailto:nilsongonze@yahoo.com.br)

Rômulo Dante Orrico filho

Email for correspondence: [romulo@pet.coppe.ufrj.br](mailto:romulo@pet.coppe.ufrj.br);

Programa de Engenharia de Transportes (Transportation Engineering Program)  
Universidade Federal do Rio de Janeiro, Rio de Janeiro, Brazil

## ABSTRACT

The aim of this paper is to show how the concept and allocation of risk involved in granting concession rights on road infrastructure are being altered with every contract model proposed by the federal government. The risk involved in a concession contract is derived from uncertainty as to the results that will be obtained in the performance of the contractual services. The evolution of the allocation of risk in these contracts reflects the understanding of the granting authority of the objectives of the privatization process being sought in each concession cycle, as well as that the mechanisms for offsetting these risks reflect the forms and formulas that the State intends to used (and uses) to mitigate these risks. The risks assumed by the private partner are reflected in the profitability of the enterprise and the risks assumed by the granting authority are offset through the economic and financial rebalancing from changes in the basic toll fee.

Keywords: highway concession, risks

## 1. INTRODUCTION

Beyond the political-economic issue, granting a transport infrastructure concession to the private sector is a realistic option to make up for the shortcomings of the State in regard to the continuity of the services necessary to maintain it in full operational use. The risks involved in this transfer must be allocated among the partners, taking into account their characteristics and their ability to absorb the costs. This article looks at the evolution of risk allocation under the three models of highway concession contracts in force in Brazil under the current federal regulations and how the latter address the allocation of risk and the compensation mechanisms.

**COMPARATIVE ANALYSIS OF THE RISKS INVOLVED IN FEDERAL HIGHWAY  
CONCESSION CONTRACTS**  
(GONZE, Nilson)

These contracts have different origins and concepts, due to the times they were conceived and the results obtained in the regulation of those that preceded them and are part of the program for the conservation, improvement and capacity expansion of those federal highways that are considered to be of strategic importance to the country's development and carry a traffic volume that makes them economically viable for exploitation by the private sector.

Taken along with similar programs by various state and local governments, the exploitation of the country's highways throws up some impressive figures. According to the Brazilian Association of Highway Concession Holders - ABCR (2012), the 55 concession contracts in force in 2011, which had led to the setting up of 283 toll plazas, recorded a combined total of 1.5 billion toll paying vehicles over a period of 12 months, generating a turnover of almost R\$ 13 billion. Note also that road transportation in Brazil represents 61% of the country's cargo transportation matrix (CNT, 2012).

To cover the need for investment that will meet this demand, the concession contracts are generally long-term, enabling the investments made to be offset by revenue from toll fees. Generally, these contracts involve large investments in the first few years, thus needing time to be amortized, while delivering a reasonable return to the operators. Hence, the length of these contracts enhances the business risks involved and demanding compensation mechanisms from the parties involved that can mitigate the effects.

This work only considers the Federal Highway Concession Program, in its two stages and three contract models, presenting, in Chapter Two, the definition and classification of risk. In Chapter Three, there is analysis of the granting of concessions as an alternative for maintaining highways, which has been adopted by the government for important highways throughout the country. Chapter Four shows the allocation of risk in contracts and how this has been changed over the course of the program. Chapter Five addresses the two most important mechanisms to offset and mitigate these risks, while Chapter Six contains the conclusions.

## **2. WHAT DO WE MEAN BY RISK?**

Risk is the essence of a concession contract. There is an undeniable correlation between the risk, or rather, its allocation, and the economic and financial balance of the concession contract. Analysis of the risks and the justifications for any rebalancing over the course of the contract allows the process to evolve, with a view to meeting the predominant criterion that the risks of a business must be allocated to those who are best able to manage them and to absorb the costs. Lewis (2001) warns that the concept of risk allocation involves the understanding that both sides, the contracting party and the contractor, lose if the contract fails. Depine (2010) confirms that the higher the concession risks, the higher the concession costs are, also.

First of all, it is necessary to define the concept of risk. According to Moreira (2006), it is the likelihood of an unexpected future outcome, which can also be defined as the possibility of incurring financial loss. Along the same lines, Ferreira and Andery (1998) state that the risk of a venture is represented by the probability that the investor will not be able to recover the capital invested, plus due earnings, at the end of the investment period. This means that risk

***COMPARATIVE ANALYSIS OF THE RISKS INVOLVED IN FEDERAL HIGHWAY  
CONCESSION CONTRACTS  
(GONZE, Nilson)***

may be understood as the likelihood of a future failure that adversely affects the expected results of the business.

This interpretation is reinforced by Christiano (2011) who, addressing public-private partnerships (PPPs), states that risk reflects the inability of the stakeholders to know in advance the evolution of the variables that determine the results of the contract, over the contractual period. This variability can also have a strong impact on the consumer of the resulting goods or services.

As for allocation, it is worth emphasizing that the inherent risks should determine the appropriate allocation of responsibility for seeking solutions or guarantees against threats pertaining to a long-term contract, such as a highway concession, that can prevent the attainment of the intended objectives. In this regard, Isquierdo and Vassallo (2004) consider that a concession holder has some control over a particular variable when its contribution is the principal determinant of the outcome.

Isquierdo and Vasallo (2004) add that public works concessions are necessarily subject to significant risks that cannot be eliminated and must be suitably allocated. They also state that concession holders reveal difficulties in controlling many of the risks involved in the business, particularly the traffic risk. This follows from the fact that the concession structure has important fixed costs and sunk costs, making it harder to adapt in response to cyclical variations in demand, and thus calls for the concession holders to take preventive steps aimed at reducing this risk.

One also has to consider, according to Perez (2006) that the more detailed the contractual specifications regarding the risks of the undertaking and the more solutions there are to inherent problems, the lower will be the effective contractual risk, with a tendency towards the greater stability of the concession and, obviously, lower transfer costs.

With regard to the classification of risk, Isquierdo and Vasallo (2004) contribute to the understanding. They consider that the risks can be classified in two ways: the first divides them according to their effect on revenues and expenses; the second classifies the risk according to the possibility of its interfering with operation and maintenance under the contract, which can be defined as market risks, force majeure or unforeseeable risks, and legal and political risks.

In contrast, Duarte (1997) shows a classification of risk from an economic perspective, defining it as:

- Market risk - related to the variability of the financial market - they can be seen in the contractual obligations for going public - and exchange rate and interest rate variations. Contracts for the exploitation of infrastructure are characterized by the need for large investments in their initial phase and long amortization periods, meaning that interest rates play a significant role in the financing of the business.
- Operational risk - related to the company's management, with professional staff that are hired, the operational services as such, relating to the management of the highway and customer support, and the construction, repair and maintenance services.
- Credit risk - related to the possibility of asset losses. In the case of a highway concession holder, it could be related to traffic risk.
- Legal risk - in the regulatory sphere it is most commonly associated with "factum principis," when the private agent, subject to any changes to the legislation in force at the time the contract was signed, will have to reorganize its planning in response to a new legal

**COMPARATIVE ANALYSIS OF THE RISKS INVOLVED IN FEDERAL HIGHWAY  
CONCESSION CONTRACTS  
(GONZE, Nilson)**

environment. This item should also include the action of a regulatory body that has the function of establishing rules to cover any contractual loopholes.

### **3. CONCESSION AS AN ALTERNATIVE TO MAINTENANCE**

Historical reasons led Brazil to adopt roads as the primary means in its transport matrix and the result has been considerable economic dependence on the country's roads, as a means of integration and product distribution and to facilitate foreign trade. Consequently, the maintenance and improvement of the road system has been a major challenge for the public authorities and the available resources have proven to be insufficient to meet the huge demand for works and services necessary to the proper conservation of the existing structures.

During the 20th century, the federal government used various financing methods for road construction and maintenance, including the earmarking of revenues and external funding. However, despite all the formulas that were conceived and put into practice, and especially following the legal limitations imposed on the earmarking of resources, the country's road infrastructure underwent a gradual and systematic process of deterioration, due to the lack of necessary and appropriate physical conservation of the public road network (Lee, 1996).

With the changes to the legislation governing contracts and public tendering procedures, which have led to stricter regulation, the procedures for the engaging of a conservation system or project (in terms of time and form) are the same as are required for a new construction. The former regulatory structure, together with the notion, on the part of many politicians, that the implementation of a new project provides greater visibility to the public administrator and that major recovery work on a deteriorated structure is more readily noted by the population than continuous conservation, had meant that the routine servicing and necessary maintenance of the road infrastructure were relegated to a lower level in the process of appropriating scarce resources.

Other important factors to be considered in the process of maintaining the road system are the variability of construction alternatives utilized or available for use and the unpredictability of sudden maintenance requirements. The combination of these factors shows up in the conservation processes, bringing a need for agility and the ability to make short-term investments on occasions that are unpredictable.

The variability of construction alternatives employed in the road infrastructure requires the designer to consider which materials and equipment can best be applied to the maintenance or conservation services and what the effects of those choices will be on the project's cost-benefit ratio. Another consequence of those choices is the timing of the maintenance cycle for the infrastructure under consideration. In fact, each of the road maintenance jobs is effectively a new project, given the complexity of the factors involved in the analysis.

The unpredictability of the real road infrastructure maintenance needs is also a significant factor. They may result from weathering or from use. The effects of weathering is most noticeable when a sudden incident destroys the infrastructure, but it may also be in the form of a slow process of degradation that gradually undermines its stability. Road use, mainly in the form of daily traffic, imposes conditions that involve reacting to emergency or routine situations. Examples of events that may be considered emergencies are the occurrence of accidents or improper actions on the part of users, such as starting fires within the road

**COMPARATIVE ANALYSIS OF THE RISKS INVOLVED IN FEDERAL HIGHWAY  
CONCESSION CONTRACTS  
(GONZE, Nilson)**

domain or vandalism of signage. On the other hand, the wear and tear on the infrastructure components caused by normal usage is predictable and expected, but also requires restorative action.

In such a scenario, with scarce resources, complex hiring procedures, varied technical solutions and unpredictable incidents, the transferring of the administration and maintenance of a designated road system to private management becomes an attractive alternative for the public authorities in all three spheres of government.

## **4. THE RISKS AND THEIR ALLOCATION UNDER A CONCESSION CONTRACT**

The Federal Highway Concession Program covers the granting of management concessions for fourteen stretches of highway. The First Step comprises five stretches of highway and the concession process was carried out in the mid 1990s. It comprised the highway connection between the country's two largest cities (São Paulo and Rio), three sections originating within the Rio de Janeiro metropolitan area and a stretch of highway with special features located in the state of Rio Grande do Sul. This First Step also includes a sixth concession procedure, named the Pelotas Highway Hub, which was carried out by the state of Rio Grande do Sul and subsequently transferred to federal management. However, due to its unique characteristics, with regard to both geography and contractual terms, this concession should not be considered in this analysis.

The Second Stage of this Concession Program has two phases, with the first comprising seven stretches of highway in the south and southeast of Brazil. The tendering process took place in 2007 and the contracts began in the first half of 2008. The second phase is a concession contract in regard to highways located in the state of Bahia, in east of Brazil, and has concepts and characteristics that distinguish it from the previous phase.

Looking to better understand the evolution of the allocation of risks over the course of this concession program and organize them in such a way as to emphasize their common features, this study classifies them according to the adopted contract model, in chronological order. So, the first contract model covers the five sections tendered by the federal government (First Step), the second model covers the seven concession blocks granted in 2007, and the third model refers to the concession contract for the highway system in Bahia .

### **4.1. First Contract Model**

Contracts resulting from the First Stage state that "the concession holder assumes full responsibility for all the risks inherent to the concession, except where the results are contrary" to the intentions of the contract itself. Note, however, that the only risk specification in the contract refers to General Traffic Risk, which is allocated to the concession holder.

Over the course of the contract, one can see that the allocation of risk to the concession holder includes those relating to attracting investment and the quality and safety of the services performed, while at the same time imposing the mandatory purchase of insurance

**COMPARATIVE ANALYSIS OF THE RISKS INVOLVED IN FEDERAL HIGHWAY  
CONCESSION CONTRACTS  
(GONZE, Nilson)**

"to ensure effective coverage of the risks inherent in implementing the activities pertaining to the concession." No statement of risks allocated to the granting authority was provided.

The highway repair and maintenance services are specified in the contracts, with the estimated costs from the drawing up of the proposal, which represents a sharing of risks, with the granting authority responsible for the quantity and specification of the services and the concession holder assuming the risks relating to the quality and cost of those services. The proviso is that "whenever structural changes in prices relating to factors of production or structural changes in prices of inputs for the main cost components are perceived (...) not addressed or covered by fee adjustments", there will be a review of the Basic Toll Fee.

#### **4.2. Second Contract Model**

For this second generation of concession contracts prepared by the government, the general and traffic risks of the concession were maintained and the operational risks were broadened. Under these contracts, the risks pertaining to the granting authority were defined, and the responsibility for any unilateral changes and for factum principus economic and financial impacts was formally stated.

The contract also makes it explicit that "the risk arising from damage to the highway deriving from causes that should be insured against, as well as the risk of variations in the costs of inputs, labor and financing" are the responsibility of the concession holder. Moreover, the contract also defines as pertaining to the concession holder "risk arising from the settlement of environmental liabilities within the highway right of way that originated after the date the contract was signed."

As for the highway repair and maintenance services, there has been a clear shift in focus, with the transfer to the concession holder of responsibility for the analysis, the project design, the budgeting and the performing of services necessary to achieve the previously defined results. Oversight is carried out by checking the results obtained from monitoring of the elements that comprise the highway infrastructure.

This change aims to make adjustments in line with the concept, already mentioned, that the risks must be allocated to those with the best conditions to manage them, by transferring to the private entity, which has more agility and technical resources at its disposal, the study of the highway section granted and the choice of the maintenance program to be implemented, thereby gaining the freedom to choose the alternative that best fits the concession project. The risk, therefore, is fully transferred to the concession holder, which in turn gains the freedom to choose its plan of action and the best adjustment to the location and timing characteristics of its repair and maintenance program.

#### **4.3. Third Contract Model**

For this model, the same treatment was given to general risks and a long list was drawn up showing the allocation of the risks inherent to the concession. In addition to specifying some of the risks that were merely implicit in the earlier contracts, this list makes new allocation of certain risks that had already been listed in the previous contract, establishing a line beyond which the risk is transferred to the other party.

**COMPARATIVE ANALYSIS OF THE RISKS INVOLVED IN FEDERAL HIGHWAY  
CONCESSION CONTRACTS  
(GONZE, Nilson)**

This new allocation can be found in the addressing of risks relating to variations in traffic flow, which until then had been borne in full by the private entity. In this new model, the public authority shall be liable for any reduction in expected traffic flow when the cause of that decline is the "introduction of new routes or alternative routes where there are no toll fees, did not exist and were not foreseen (...) in government planning public instruments or other official sources."

Another example of the imposition of limitation for the transferring of responsibility refers to the possibility of "social and/or public demonstrations that in any way affect the performing of works or provision of services related to the Contract for up to 15 (fifteen) days, whether consecutive or not, in each 12 (twelve) month period." In such cases, as from the 16th day, the granting authority will be responsible for these costs.

A special case found in the list of risks deals with the "difference in revenue from rounding off the toll fee." In previous models, a toll fee rounding off rule is to be applied in order to facilitate change and differences are considered in the procedures for economic and financial rebalancing of the contract. Specifically in the case of this contract, to reduce the number of events that generate contract rebalancing, the risk relating to the adopted formula for rounding off has been transferred to the concession holder, who will absorb any excess or shortfall resulting from this procedure.

The allocation of risks relating to highway repair and maintenance retain the same concept that is a feature of this second stage, with the concession holder responsible for determining the quantities, costs and performance, and absorbing any benefits or losses in relation to differences found.

## **5. MECHANISMS FOR OFFSETTING THE RISKS**

For every predicted risk in a business, there should be a corresponding compensatory measure or a cost that should be incorporated into the investment forecast. For risks to be assumed by the concession holder, alone, the concession contracts provide for mandatory insurance and this condition is common to all contracts. For the risks that the granting authority will retain, the concessionary compensation is obtained through a review of the economic and financial balance, which is reflected in the Basic Toll Fee charged to highway users.

Before discussing these compensation mechanisms, it is necessary to determine who assumes the risks identified in the concession contracts. Hence, market risks, which are inherent in any business, do not have specific protection in the concession contracts for the operation of road infrastructure that are currently in force and they should be managed by the concession holder responsible for the service provided.

Credit risk has also been attributed exclusively to the concession holder, except in the specific case of the second phase of the second stage, where variations in traffic as a result of the implementation of a stretch of road that competes for business with the road under concession will be covered by the granting authority.

Legal risk originates from and is the responsibility of the granting authority, except in regard to taxation on corporate profitability.

As for operational risk, it is this allocation that has been most susceptible to changes in the intended objectives when a highway concession has been granted. According to the incident

***COMPARATIVE ANALYSIS OF THE RISKS INVOLVED IN FEDERAL HIGHWAY  
CONCESSION CONTRACTS  
(GONZE, Nilson)***

being analyzed, this can be offset either through insurance, or through a review of the economic and financial balance.

## **5.1. Insurance**

Conceptually, insurance is a mechanism for transferring risk, of loss or damage, from one person, company or entity to another in exchange for a previously determined value. Upon the occurrence of events or situations that have been insured against, the insurer compensates the policy holder financially so that he, she or it can rebuild, repair, and indemnify the damages or losses incurred.

The insurance anticipated in the concession contracts is to guarantee against any damages that might be incurred users and/or to the physical elements of the highway, in order to compensate or at least mitigate the operational risks, and should at least cover the performing of the intended works and services and any damages caused by unforeseeable circumstances or what is termed force majeure. Insurance of this kind has been required under the contracts, which specify the risks that are to be covered, and they exempt the concession holder only in cases where the insurance companies do not provide cover for what is being required.

## **5.2. Economic and Financial Balance (EFB)**

According to Vasconcelos (2004), the concept of economic and financial balance is closely related to the idea of fair equivalence between responsibilities and benefits among contracting parties and those being hired. The federal legislation (Brazil, 1995a), for its part, states that "whenever the terms of a contract are maintained, it is considered that the economic and financial balance has been maintained, while allowing mechanisms for reviewing the toll fees and determining that, should there be any unilateral alteration to the contract that affects its initial balance," that balance must be restored. In the same vein, Carvalho (2010) adds that, depending on the risk allocation, the initial EFB clause represents an acquired right of the private party that can only be amended through negotiation between the parties.

For First Stage contracts, the EFB is defined as "a fundamental principle and that any change in the concession holder's charges can result in the revision of the value of the Basic Toll Fee, up or down, as stated" in the contract.

The second contract model retains the EFB as a fundamental principle and states that this "is defined by the discounted cash flow that will ensure the concession holder the unleveraged Internal Rate of Return agreed upon the signing" of the concession contract. In this model, in the event of the "meeting of the contractual terms, the risk allocation determined therein should be maintained, and a revision of the economic and financial balance should only be done under the stipulated circumstances", that equate to the risks borne by the granting authority.

To maintain the EFB, besides changing the value of the basic toll fee, a change in the contractual term can also be considered as one of the compensatory mechanisms. Internally, the scheduling of investments over the cash flow period is a way of compensating for

**COMPARATIVE ANALYSIS OF THE RISKS INVOLVED IN FEDERAL HIGHWAY  
CONCESSION CONTRACTS  
(GONZE, Nilson)**

changes through the insertion or exclusion of investments, when one aims to reduce the impact on the toll fee.

## **6. CONCLUSION**

The conceptualization and allocation of risk under the Federal Highway Concession Program shows the form and limit of the responsibilities that the granting authority is contemplating when transferring the provision of this public service to private enterprise. Under the first contract model, the responsibilities transferred to the concession holders are basically limited to the performance of the intended services, with the public body retaining the management of the process, and therefore the responsible for making most of the technical decisions regarding the project. This concept reflects, in a way, the relationship of contracting party and hired party, in that the former assumes the decision risks and the latter, the performance risks.

Under the second contract model, the transfer of the management to the private entity is accompanied by responsibility for the results achieved in relation to the repair, maintenance and conservation of the highway infrastructure. The use of performance parameters for the physical and functional aspects of the highway elements is a demonstration of the transferring of the highway management to the concession holder, and with it, the transferring of the risks relating to the analysis and implementation of determined solutions. It must be noted that the contract provides for clearer and more objective risk allocation.

The third concept specifies the allocation of risks and seeks to reduce the incidents that can justify the use of the economic and financial rebalancing mechanism, by putting in the contract a procedure aimed at limiting the impact of any given incident. Setting limits for a risk and transferring responsibility after a specific point is reached is indicative of a model that deserves some attention in its development. This dividing of risk is an innovation that is embedded in this model and seeks to adjust itself to the fundamental concept of risk allocation.

Finally, the perceived changes from the adoption of new contract models show a deepening in the addressing of issues relating to risk and its allocation, revealing an adjustment of the concepts applied that tends towards the latest theories on the subject. The compensation mechanisms show that certain risks are still absorbed by the highway users, even though, in theory, the responsibility may be the concession holder's. Consequently, it is understood that the concession contracts require further study aimed at introducing mitigation procedures that protect the users from any harm resulting from the occurrence of such situations.

## **BIBLIOGRAPHY**

ANTT, Agência Nacional de Transportes Terrestres. Concessões de Rodovias – Apresentação e Concessionárias. Available at <<http://www.antt.gov.br/concessaorod/apresentacaorod.asp>> and <<<http://www.antt.gov.br/concessaorod/concessionariasrod.asp>>>. Last accessed on April 5, 2011.

***COMPARATIVE ANALYSIS OF THE RISKS INVOLVED IN FEDERAL HIGHWAY  
CONCESSION CONTRACTS  
(GONZE, Nilson)***

- Brandão, L. E. T. and Saraiva, E. C. G. (2007). Risco privado em infra-estrutura pública: uma análise quantitativa de risco como ferramenta de modelagem de contratos. Rio de Janeiro. Available at <<http://www.scielo.br/pdf/rap/v41n6/03.pdf>>. Last accessed on June 6, 2011.
- BRASIL (1987). Decreto n. 94.002, de fevereiro de 1987. Dispõe sobre a concessão de obra pública, para construção, conservação e exploração de rodovias e obras rodoviárias federais e dá outras providências. Available at <[http://www.planalto.gov.br/ccivil\\_03/decreto/1980-1989/D94002.htm](http://www.planalto.gov.br/ccivil_03/decreto/1980-1989/D94002.htm)>. Last accessed on November 15, 2010.
- BRASIL (1995a). Lei n. 8.987, de 13 de fevereiro de 1995. Dispõe sobre o regime de concessão e permissão da prestação de serviços públicos previstos no art. 175 da Constituição Federal, e dá outras providências. Available at <[http://www.planalto.gov.br/ccivil\\_03/Leis/L8987cons.htm](http://www.planalto.gov.br/ccivil_03/Leis/L8987cons.htm)>. Last accessed on November 15, 2010.
- BRASIL (1995b). PG137/95-00 Contrato de Concessão de serviço público precedida de obra pública entre a União, por intermédio do Departamento Nacional de Estradas de Rodagem - DNER e a "Concessionária da Rodovia Presidente Dutra S.A." Agência Nacional de Transportes Terrestres. Available at <<http://www.antt.gov.br/concessaorod/contratos/20090727ContratNovadutra.pdf>>, <[http://www.antt.gov.br/concessaorod/contratos/20090727ContratNovadutra\(aditivo\).pdf](http://www.antt.gov.br/concessaorod/contratos/20090727ContratNovadutra(aditivo).pdf)>, <<http://www.antt.gov.br/concessaorod/contratos/9TADutra.pdf>> and <<http://www.antt.gov.br/concessaorod/contratos/10TADutra.pdf>>. Last accessed on November 14, 2010.
- BRASIL (1995c). PG 138/95-00 Contrato de Concessão de serviço público precedida de obra pública entre a União, por intermédio do Departamento Nacional de Estradas de Rodagem - DNER e da "Companhia de Concessão Rodoviária Juiz de Fora - Rio S.A.". Agência Nacional de Transportes Terrestres. Available at <<http://www.antt.gov.br/concessaorod/contratos/20090727ContratoConcer.pdf>> and <[http://www.antt.gov.br/concessaorod/contratos/20090727ContratoConcer\(aditivo\).pdf](http://www.antt.gov.br/concessaorod/contratos/20090727ContratoConcer(aditivo).pdf)>. Last accessed on November 14, 2010.
- BRASIL (2007a). Contrato de concessão de serviço público decorrente do Edital 001/2007 entre a União, por intermédio da Agência Nacional de Transportes Terrestres e a Auto Pista Régis Bittencourt S.A. Available at <<http://www.antt.gov.br/comunicadoaudiencia/contratos/edital001/20090727ContratoAutoPistaRegisBitencourt.pdf>> and <[http://www.antt.gov.br/comunicadoaudiencia/contratos/edital001/20090727ContratoAutoPistaRegisBitencourt\(aditivo\).pdf](http://www.antt.gov.br/comunicadoaudiencia/contratos/edital001/20090727ContratoAutoPistaRegisBitencourt(aditivo).pdf)>. Last accessed on June 6, 2011.
- BRASIL (2007b). Contrato de concessão de serviço público decorrente do Edital 007/2007 entre a União, por intermédio da Agência Nacional de Transportes Terrestres e a Concessionária Rodovia do Aço S.A. Available at <<http://www.antt.gov.br/comunicadoaudiencia/contratos/edital007/20090727ContratoRodoviadoAco.pdf>>. Last accessed on November 15, 2010.
- BRASIL (2009). Contrato de concessão das Rodovias Federais BR 116/BA, BR 324/BA, BA 526 e BA 325 entre a União, por intermédio da Agência Nacional de Transportes Terrestres e a Viabahia Concessionária de Rodovias S/A. Available at

*COMPARATIVE ANALYSIS OF THE RISKS INVOLVED IN FEDERAL HIGHWAY  
CONCESSION CONTRACTS  
(GONZE, Nilson)*

<<[http://www.antt.gov.br/concessaorod/ViaBahia/Contrato\\_Bahia20110215.pdf](http://www.antt.gov.br/concessaorod/ViaBahia/Contrato_Bahia20110215.pdf)>>  
and <<[http://www.antt.gov.br/concessaorod/ViaBahia/PER\\_viabahia\\_20110526.pdf](http://www.antt.gov.br/concessaorod/ViaBahia/PER_viabahia_20110526.pdf)>>. Last accessed on June 7, 2011.

- Carvalho, A. C. (2010). Dinâmica das regras econômicas e jurídicas nos contratos de concessões de serviços públicos. Available at <<http://escholarship.org/uc/item/235717zv>>. Last accessed on June 6, 2011.
- CNT (2012) – Boletim Estatístico Março 2012. Confederação Nacional do Transporte Available at [http://www.cnt.org.br/Imagens%20CNT/PDFs%20CNT/Boletim%20Estat%C3%ADstico/Boletim%20Estatistico%20CNT%20-%20mar\\_2012.pdf](http://www.cnt.org.br/Imagens%20CNT/PDFs%20CNT/Boletim%20Estat%C3%ADstico/Boletim%20Estatistico%20CNT%20-%20mar_2012.pdf). Last accessed on July 17, 2012.
- Depiné, F. D. C (2010). Concessão de rodovias: modalidades e formas de remuneração do concessionário. Master's dissertation on Law. Pontifícia Universidade Católica de São Paulo. São Paulo. Available at <<[http://www.sapientia.pucsp.br/tde\\_busca/arquivo.php?codArquivo=11005](http://www.sapientia.pucsp.br/tde_busca/arquivo.php?codArquivo=11005)>>. Last accessed on June 6, 2011.
- Dias-Batista, D. A. (2008) Inovações na modelagem do Programa de Concessão de Rodovias Federais. Available at <<[http://www.anpet.org.br/ssat/interface/content/autor/trabalhos/publicacao/2008/241\\_CT.pdf](http://www.anpet.org.br/ssat/interface/content/autor/trabalhos/publicacao/2008/241_CT.pdf)>>. Last accessed on June 6, 2011.
- Duarte Junior, A. M. (1997). Risco: Definições, Tipos, Medição e Recomendações para seu Gerenciamento. Available at << <http://www.risktech.com.br/PDFs/RISCO.pdf>>>. Last accessed on June 6, 2011.
- Ferreira, A. C. A. and Andery, P. R. P. (1998). Análise de riscos em sistemas de concessão de serviços públicos. Available at <<[http://www.abepro.org.br/biblioteca/ENEGET1998\\_ART432.pdf](http://www.abepro.org.br/biblioteca/ENEGET1998_ART432.pdf)>>. Last accessed on June 6, 2011.
- Franco, V. G. (2007). Parceria Público-Privada no Brasil: Em busca da eficiência por meio da alocação de riscos. Master's dissertation on Political Economics. Pontifícia Universidade Católica. São Paulo (SP).
- Isquierdo, R.; Vasallo, J. M. (2004) Nuevos sistemas de Gestión y financiacion de infraestructuras de transporte. Colégio de Ingenieros de Caminos Canales y Puertos, Madrid – España.
- Lee, S. H., (1996). Concessão de rodovias à iniciativa privada: critério para limitação de tarifas em processos de licitação. Master's dissertation on Civil Engineering. Universidade Federal de Santa Catarina. Florianópolis (SC).
- Lewis, M. K. (2001). Risk management in public private partnerships. Adelaide, Australia. Available at << [www.unigoettingen.de](http://www.unigoettingen.de)>>. Last accessed on September 7, 2012.
- Moreira, L. L. (2006). Risco de Mercado: Análise Comparativa de Métodos de Mensuração de Risco Aplicado ao Mercado Brasileiro. Master's dissertation on Business Economic Management –Economics Post-Graduate Program, UnB – Universidade de Brasília, Brasília (DF).

***COMPARATIVE ANALYSIS OF THE RISKS INVOLVED IN FEDERAL HIGHWAY  
CONCESSION CONTRACTS  
(GONZE, Nilson)***

- Müller, L. H. (2010). Regulação do Equilíbrio Econômico-financeiro das Concessões de Rodovias mediante Taxa Interna de Retorno Flutuante. Master's dissertation on Business Management. Getúlio Vargas Foundation. Rio de Janeiro (RJ).
- Page, S. N., W. Ankner, C. Jones and Fetterman, R. (2008). The Risks and Rewards of Private Equity in Infrastructure. Available at <<http://pwm.sagepub.com./content/13/2/100.full.pdf+html>>. Last accessed on June 7, 2011.
- Perez, M. A. (2006). O risco no contrato de concessão de serviço público. Editora Forum. Belo Horizonte (MG).
- Silva, H. N. (2004). Risco de Tráfego e os Mecanismos de Concessão de Infra-estruturas Rodoviárias com prazo variável. Master's dissertation on Transport Engineering – Área de Concentração: Sistemas de Transportes. Federal University of Rio Grande do Sul. Porto Alegre (RS).
- Tsekeris, T. and Vob, S. (2008) Design and evaluation of road pricing: state-of-the-art and methodological advances. DOI 10.1007/s11066-008-9024-z
- Vasconcelos, A. S. (2004). O equilíbrio econômico-financeiro nas concessões de rodovias federais no Brasil. Post Graduate treatise on Outside Control – Instituto Serzedelo Correa do Tribunal de Contas da União. Brasília (DF)