

## A review of the proposed motorway monetization in Croatia

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**Abstract:** The Government of the Republic of Croatia requested from an advisor to carry out a study on the monetization of the public motorways. The stated reasons of the monetization are the raising of the funds for new state investments, the solving of the high indebtedness of the public motorways and the reduction of the public debt. The advisor failed to thoroughly examine the other options of monetization apart from leasing the motorways under concession. The author analyses the report of the monetization advisor and is the first to point at the significant oversights that reduced the indicative amount of the monetization. The monetization cost was compared to the interest rate of the credit indebtedness. According to the comparable transactions, some significant risks of the proposed model were quantified and evaluated. In the second part, the operations of the motorways in the country and neighbouring countries are compared, thus showing the possible optimizations of the operations. This paper indicates the significant financial potential and the value of the infrastructure in question. The financial state of the motorways is the consequence of bad investments and management and the proposed monetization model functions so that the current state of the government competence is projected and cemented for a long period. The author offers a new model of motorways management.

**Key words:** motorways monetization, motorways concession, motorway management, incompetence, public administration, public property, Croatia

### 1 Introduction

By monetizing the motorways, the Republic of Croatia (RH) intends to let the motorways that are public property to a private partner under concession for a long period in exchange for a one-time money transfer. With that money, it would reduce the need to indebt the country at the credit market in the current budget year. By publishing the reports (Group of Advisors, 2013) the details of this procedure became available to the public. The first one to point at the monetization risks that ensue after the guarantees undertaken by the Republic of Croatia (without quantification) was (Grubišić Šeba, 2013). The paper concluded that the indebtedness of the motorways at the credit market, with the country guarantees, is a better option. The continuation of the state subsidies to the motorways (fuel excise duty) is among the assumptions, however, it was decided in the meantime that they would be reduced to one-third from 2014. Moreover, precisely the difficulties in the indebting of the state budget were the main reason for the monetization and the

indebtedness of the motorways could extrude the country from some financial markets. Finally, it remained unanswered, what interest rate is the opportune limit for seeking of the solution by classic indebtedness, in comparison with the proposed monetization?

The answer to the abovementioned question will be offered in a wider context of motorways management. The method will be proposed and the value of the expected expenditure of the realization of the part of the risk of letting the motorways under concession will be, at least roughly, estimated. The mentioned papers (Group of Advisors) and (Grubišić Šeba) determine the value of motorways on the basis of existing accounting reports and plans and they do not deal with the efficiency of the managing of the infrastructure. Therefore, among the research issues, it would be interesting to research potentially feasible levels of operative incomes and motorway costs and answer the question: How much do the incompetence of the management and the owner cost? Finally, how to improve the existing model of managing the public property, help the public budget and increase the public good?

The aim of this paper is to shift from the previous discussion on the financial conditions of the monetization and point at the fundamental problem, which is, in the author's opinion, the incompetence of the public administration.

The paper is focused around three hypotheses:

1. the publicly owned motorways are badly managed (*incompetence*)
2. by the proposed model of letting motorways under a long-term concession, in the foreseeable future, the existing dissatisfactory level of public benefit from the motorways will remain the same (*cementing the incompetence*)
3. the monetization by letting motorways under a concession is suitable for, with discounting of the present value, the projection of the existing operational efficiency in the future (*the projecting of the incompetence*)

The hypothesis is, to some extent, opposed to the accepted economic opinion that the private owner is a better manager than the country (Friedman & Boorstin, 1996). During the interpretation of the mentioned conflict, it should be taken into consideration that it deals with a specific infrastructure which is a natural monopoly with public externalities that are not easily channelled into cash flow (Levinson, 2006a). For instance, the study (Dadić and associates, 2008) mentions the fact that a motorway changes the value of the real estate along which it is located, and the tolling method influences the crowds, time spent by drivers, fuel consumption and pollution. According to the (The Institute for Tourism, 2006), the experience of guests with the roads influences their satisfaction with the overall touristic stay and according to the (The Institute for Tourism, 2011), the activities interacting with them can influence their plans for staying and spending. The hypothesis should be interpreted in a way that the public-private partnership is just a tool which should be properly applied for the benefit of the public good (Levinson et al, 2006b).

The hypothesis of the incompetence of the motorway management will be proven by listing the cases in which the public interest was not paid any regard to. The quantity of the stated examples will clearly point that this is not only about isolated cases, but that there is a chronic lack of knowledge and competence to manage motorways at the level of public government in the Republic of Croatia. The hypothesis of the monetization as a transaction that projects current incompetence of managing motorways into future will

be proven through the formula for indicative monetization value, described in (Group of Advisors). The third hypothesis, on the cementing of the incompetence level, is grounded on the knowledge that upon the conclusion of the monetization, until the finalization of the concession period, the public government will not be able to, any longer, freely optimize the motorway management to the public interest and benefit, but that it will mostly be determined by the parameters in effect at the moment of conclusion of the transaction and the obligations taken by the monetization.

The motorway monetization topic is now very current and significant for the Croatian society. It is about the property that is publicly owned and whose individual value can only be compared with the electro-energetic system of the Republic of Croatia. The monetization is an attempt to overcome the motorway liquidity problems, which can endanger the execution of the state budget in the following two years. However, the fundamental problem is the choice of the motorways management model which will be beneficial to the whole society. The paper (Levinson, 1999) showed that the outcomes of the management of a transport infrastructure can significantly differ depending on the set aim. In this paper, it is suggested that the aim of the management is the optimization of the benefits to the entities that the country is responsible for, which is written in the task (1) in the chapter 2.2. It differs from the similar tasks (Levinson, 1998, p. 87) by the condition that the country must not impose the costs to the entities that it is responsible for, higher than the benefits it provides. In the other part of the second chapter, the current financial state of the motorways is described, as well as, the influence to the state budget and the public debt.

In the third chapter, the main features and weaknesses of the monetization by letting motorways under concession are explored and the possibility of seeking the solution outside the traffic system is pointed at. In the Table 3, the comparison between the monetization and the classic indebtedness is provided. The current proposal of the monetization model should be observed in the context of the relation among the stakeholders in motorway management (section 3.4). The behaviour of the Government of the Republic of Croatia is interpreted according to the behavioural theory of cognitive dissonance (Carlson & Heth, 2010), whereas, regarding the behaviour of the motorways management, the attention is paid to the effect of non-refundable cost (Bokulić & Bovan, 2013). Thus, the description of the current situation, started in the second chapter, is completed and the hypothesis of the bad motorways management is supported.

The chapter four starts with a brief study of the three prominent cases of public-private partnership in the Republic of Croatia. The presented cases fit into the experiences with giving motorways concessions in Italy, see (Limodio, 2011). In the second part of the chapter, based on the historical data, the likelihood of the realization of the risk in similar operations is estimated. The mathematical formula for the estimation of the current risk value (3) is based on the method of cash flow discounting.

The value of motorways, as business property, is based on the value of cash flows they generate. The cash flows, with no new investments, are created by the interaction of operative profitability of the operations and financial activities. After the comparative analysis of the financial and material indicators of the motorways operators in Croatia, Slovenia, Austria and Hungary and the basis of the theory of traffic and roadway wear and tear (chapter five), in the chapter six the data is used in order to examine the potential of the operative profit from the motorways. Thereby, the shortcomings of the statistical approach to the profitability from the papers (Group of Advisors) and (Grubišić Šeba) are surpassed. On the same basis, though more comprehensively, the concessionaires were compared in Italy by (Messiani & Ragazzi, 2008).

At the end of the chapter six, the option of granting concession is compared to the option of retaining public administration over motorways. The author, there, presents a proposal of a governing model, which could be used in the situations when the property owner lacks knowledge and competence to effectively manage the property, and the selling or long-term handing over cause negative externalities, i.e. risk to the present owner.

## **2 The Motorways Owned by the Republic of Croatia**

### **2.1 The influence on the public finances**

The motorways in the Republic of Croatia are governed by two state-owned companies: Autoceste Rijeka-Zagreb, joint-stock company (Rijeka-Zagreb Motorway - ARZ) and Hrvatske autoceste Ltd. (Croatian Motorways - HAC) and two companies with dominant influence by a private (foreign) owner: Autocesta Zagreb – Macelj Ltd. (Zagreb – Macelj Motorway - AZM) and Bina-Istra, joint stock company (BINA). The consolidated indebtedness of ARZ and HAC at the end of 2013, according to the estimation based on the data from the end of 2012 and the construction plan for 2013, amounted to over 31 billion HRK (Group of Advisors, p. 75 and 87), i.e. more than 9% of the gross domestic product (GDP). The Ministry of Finance estimates<sup>1</sup> that the public debt will reach 190 billion HRK at the end of 2013 or around 57% of GDP. In the document<sup>2</sup> of the Ministry of Maritime Affairs, Transport and Infrastructure (MPPI), it was stated that the motorway indebtedness amounts to about 15% of the public debt of the Republic of Croatia. However, according to the opinion of the author, that is not true.

The ARZ and HAC debts are guaranteed by the state, however, until now, they have not entered in the public debt calculations. According to the ESA 95 methodology (used by EUROSTAT and the Croatian Bureau of Statistics - DZS), the public debt includes the debts of the state-owned companies that generate loss of accumulate debts (Bajo & Galinec, 2013). The ARZ and HAC debts enter into the public debt at the point of the activation of the government guarantees (due to the impossibility of repayment) and in case of significant changes in the motorway management (e.g. the concession loss). It is the unpleasant fact that in the next 5 years 19 billion HRK of these debts are due for payment and in 2014 as much as around 7 billion HRK of debt. This presents a considerable impact to the liquidity of these companies, which can be, only in a small part, covered by the regular operations (Table 1), so the overcoming this by a new loan or with the state subsidies is inevitable. In the Guidelines of the Economic and Fiscal Policy for the period 2013-2015, the projection of new borrowing in 2014 of around 30 billion HRK<sup>3</sup> is stated. Considering the state of the financial markets and the credit position of the Republic of Croatia, it is expected that the motorways debt refinancing, which is due in 2014, could present a serious problem, not only for ARZ and HAC, but for the country as a whole. Since the Ministry of Finance (MFIN) got long-term indebted in November 2013, by a rate at around 6%, including the company risk premium, it is realistic to expect that the new borrowing would be considerably above the, so far, medium interest rate for the ARZ and HAC debt, which is 6%. The government of the Republic of Croatia recognized this problem, so, in 2012, it stated the problem

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<sup>1</sup> Croatian Bureau of Statistics (DZS), The Report on the Budget Deficit and the Level of the General Government Debt in the Republic of Croatia, October 2013

<sup>2</sup> Ministry of Maritime Affairs, Transport and Infrastructure (MPPI), The Proposal of the Comprehensive Response to a Parliamentary Question about the Feasibility of the Privatization of Motorways, CLASS: 013-01/12-01/87; REG. NUMBER: 530-05-12-6; 22nd November 2012

<sup>3</sup> Ministry of Finance (MFIN), Guidelines of the Economic and Fiscal Policy for the period 2013-2015, [www.vlada.hr/hr/content/download/220936/3245155/filr/44.-1.1.pdf](http://www.vlada.hr/hr/content/download/220936/3245155/filr/44.-1.1.pdf)

of high motorways indebtedness and public debt as one of the two main monetization reasons in the Decision on the Implementation of the Advisors Selection Process for the Services of the Public Debt Monetization Related to the Companies HAC and ARZ.<sup>4</sup>

**Table 1.** Financial motorways indicators (ARZ and HAC) in 2012

(Group of Advisors, 2013; ARZ, The report on the state of the company in 2012, June 2013, www.arz.hr)

Employees' number	3,589
Employees in the tolling sector	1,143
The ratio between the employees in the tolling / the rest	46.7%
Income from tolls	1.77 billion HRK
Subsidies from the fuel excise tax	1.4 billion HRK
Other incomes	140 million HRK
Expenditures for the employees' salaries	531 million HRK
Operating costs	929 million HRK
EBITDA	870 million HRK
Interest costs	1.72 billion HRK
Gross debt	30.4 billion HRK
Potential off-balance debt	around 9 billion HRK
The weighted debt interest rate	5.7%
Investment plan for 2013	1.75 billion HRK
Expected indebtedness at the end of 2013	31 billion HRK

Another reason for the monetization stated in the mentioned decision is the raising of funds for new investments. The motorways receive the public subsidies to their operations which they record as an income, in a manner that the part of the excise tax collected from the motor fuel consumption in whole Republic of Croatia is directly channelled as the income of HAC (in 2012 around 1.4 billion HRK) for the purpose of investment. Excluding that income, the earnings from the motorways operating business (EBITDA) in 2012 were about 870 million HRK. However, the interests cost was 1.72 billion HRK. Without the income from the fuel excise tax, the publicly-owned motorways currently cannot cover the debt costs. It is inevitable that the most of the planned investments of 1.75 billion HRK in 2013 are financed by new borrowings.

The large interest cost arises as the main problem in the current motorways operations and it is simply a consequence of the enormous indebtedness and not enough profitable investments. An inescapable conclusion is that the government of the Republic of Croatia should have stopped the investing in the

<sup>4</sup> The Government of the Republic of Croatia, Decision on the Implementation of the Advisors Selection Process for the Services of the Public Debt Monetization Related to the Companies Hrvatske Autoceste Ltd. and Autocesta Rijeka-Zagreb joint-stock company, 2<sup>nd</sup> August 2012

motorways with the aim of the motorways operations stabilization and due to the lack of profitable calculation. However, in spite of the lack of the investment feasibility studies and the consequences of the previous incompletely thought-out investments, the investing was continued with, because that presents the foundation of the political programme with the dogma of the investments as a flywheel of the economic development. There is no long-term strategy for the construction of roads in the Republic of Croatia, but the Construction Programme<sup>5</sup> for the period 2013-2016 includes the investments in construction and the investment maintenance of around 7.7 billion HRK (comparing to 11.8 in the previous four years).

In case of the abandoning of new investments, the reduction of indebtedness by a half of the present amount<sup>6</sup> (15 billion HRK) would be enough for motorways to efficiently service the outstanding debt (EBITDA = interest) with the present level of operating business, without the subsidies from the part of the fuel excise tax. Thus, the mentioned amount of the subsidies from the excise tax could be available to the HAC for other investments. It should be emphasized that, from 2014, the amendments to the Law on Public Roads will be in effect, according to which the incomes of the public motorways from the fuel excise tax are reduced by two-thirds of the amount from the previous years (compare with the data from the Table 5), while the incomes of the other public roads are increased by one-third. The author believes that, with this decision, the public authorities upset the balance in the cash flow and, if there are not any significant changes in the operating business during 2014, the escalation of the HAC liquidity problem will occur. Due to the considerable HAC income decrease, creditors will increase the expenses and, possibly, completely suspend refinancing of the overdue debts. Thereby, the urgent action of the Republic of Croatia will be provoked, directed at solving the liquidity problem.

## 2.2 The theoretical task of the management of the publicly-owned motorways and consequences

If we mark the set of all entities that the Republic of Croatia should thoroughly look after (citizens, etc.) with the letter  $U$ , and the value of the gross benefit the entity receives from the motorways (benefit) with  $D(x)$ , then the isolated task of the motorways management as a public good can theoretically be set as:

find function  $D$  that maximizes sum  $\sum_{x \in U} D(x)$  with the condition that  $D(x) \geq 0$  for every  $x \in U$ . (1)

It is common to suppose that the benefit  $D(x)$  can be expressed as a difference between the total benefits  $K(x)$  and the total costs  $T(x)$  for an individual entity  $x$ . The cost that the entities have can be connected to the motorways benefits in different degrees. We list the examples, starting from these where the costs that the country imposes on the entities is more directly related to the benefits that the entities receive: tolling, fee for the sub-concessions at the rest areas, fuel excise tax, the tax on the property along the motorway, general income tax. The benefits that the entities take,  $K$ , also depend on the decisions of the country: the proximity of the motorway, the position of the enter/exit tollgates, the way of tolling, etc. Another example of the interdependence of functions  $T$  and  $K$ : with reducing the toll price, the motorway will have higher traffic and higher society benefits until a point. The function  $T$  is, in practice, based on the real motorway costs: investment, maintenance, tolling, financing, etc.

<sup>5</sup>The Government of the Republic of Croatia, The Programme for the Construction and Maintenance of Public Roads for the Period from 2013 to 2016, 27<sup>th</sup> December 2013

<sup>6</sup> The key question remains: how, at the present condition of the public finances, to raise such a sum.

The condition in (1) that the gross benefits  $D$  are not negative for any entity is based on the necessity that the country is responsible for all its entities. As far as the author knows, until now, this condition was neglected, at least in the literature on tolling and development of the traffic infrastructure, compare (Levinson, 1998, p. 86-88). However, it is clear that there is dissatisfaction in the segments of society where this condition is not fulfilled. It can be theoretically interpreted that the adverse impacts of the motorways on public finances (the possibility of the overflowing of the indebtedness into the public debt) which are now occurring, can present a problem, since one part of the society will suffer the damage that surpasses the benefits from the motorways. The conclusion is that the country is not doing the task (1) well. Otherwise, the problem of the influence of the motorways on public finances could be removed if the country informed its entities better on the benefits and costs they suffer, in order to later show that the dissatisfaction was not justified and that the country is solving (1).

In Croatia there is no comprehensive study (or a project) that would count and calculate all the benefits the society has from motorways. Nevertheless, let us show how the task (1) can be used without that, with a certain limit. With that purpose, let us suggest that it is possible to transfer from the higher prices coded by the function  $D_1$  to the lower prices  $D_2$  so that the prices influence just the entities from the set  $V \subseteq U$  (e.g. local traffic). In other words, because of the increase of the database of the road users, the toll income has increased and can be transferred to the other entities from  $U \setminus V$  (that did not feel the price reduction) precisely so that it covers the negative externalities (e.g. crowd and pollution), that is  $D_2(x) = D_1(x)$ , for  $x \in U \setminus V$ . The set of users who previously used the road  $V_1 \subseteq V$  has the equal benefits, but lower expenses, so it follows  $D_2(x) > D_1(x)$ , for  $x \in V_1$ . There are other users which have not used the road before but now they do, because their benefits are higher than the costs (set  $V_2 \subseteq V$ ), that is,  $D_2(x) > D_1(x)$ , for  $x \in V_2$ . It can be concluded that the function  $D_2$  solves the task (1) better than the function  $D_1$ .

The problem of motorway management is classically solved by the method of optimization of the internal return rate of the investment. From the standpoint of public finances or the country overall benefit, all motorway effects to the public finances and the country in general should be included into the investment return rate, as it is suggested in (HM Treasury, 2011). Such analyses that could justify the directing of public revenues into motorways, so far, have not existed in the Republic of Croatia.

### **2.3 Profitability**

The high indebtedness of the motorways in the Republic of Croatia is a consequence of their insufficient profitability. The situation became long-term unsustainable when the debt interest could not be covered from the operative business (EBITDA). Following the fact that the complete funding of the motorway construction was financed from a debt (of the companies and the country), it is necessary in the long-term that the investment return rate corresponds to, at least, the interest rate on the debt. Whereas, all public revenues should be included in the investment return rate as mentioned in the previous section. We do not have such comprehensive data in this paper, so we continue commenting on the basis of the information from the accounting reports of the companies for 2012 (Table 2).

**Table 2.** Financial indicators of HAC and ARZ in 2012(Group of Advisors, 2013; ARZ, The Report on the Company State in 2012, June 2013, [www.arz.hr](http://www.arz.hr))

Motorway length (km)	1,049
Employees' number	3,589
Employees in the tolling sector	1,143
The ratio between the employees in the tolling / the rest	46.7%
Employees in the maintenance sector	1,837
Employees in the maintenance per km	1.8
Driven (travelled) kilometres (million)	4,747
Motorways income per a travelled kilometre	0.37 HRK
Share of light passenger vehicles in the income (ARZ)	66%

The low ratio between EBITDA and the property (1.7%) can partly be a result of the previous bad investments. However, for the operations stability, the ratio between EBITDA and the indebtedness is more important and now it is around 2.9%. Comparing that with the current interest rate averagely paid by the motorways (5.7%) it is clear that the investments in the motorways are insufficiently profitable. The reasons are manifold.

The main reason is the construction for daily political purposes, based on a political decision<sup>7</sup>, without a comprehensive examination of the investment return rate and consideration of the task (1). The other reason can be (unconfirmed) overpaid works<sup>8</sup> which could directly lead to the inflated accounting value of the property and over-indebtedness. This state cannot be changed (spilled milk, sunk cost). The third reason can be found in the insufficient business optimization: insufficient incomes and excessive operating costs. Assuming that there are no new purposeful investments, it is only the business optimization that can improve the profitability.

#### 2.4 The implementation of the restructuring of ARZ and HAC

From the beginning of 2013, the restructuring of ARZ and HAC is being implemented. The company Croatian Motorways Maintenance and Tolling Ltd. (Hrvatske autoceste održavanje i naplata cestarine, HACONC) was founded with the plan to take the employees and the maintenance and tolling jobs from ARZ and HAC. It is expected that, after the implementation of the restructuring, the employees' number

<sup>7</sup> Novi list, The interview with the Chairman of the ARZ Board, 14<sup>th</sup> October 2012

<sup>8</sup> Nacional, The Model for the Robbery of HAC billions, No 797, 22<sup>nd</sup> February 2011



decreases from 3,589 at the end of 2012 to around 2,800 (2.7 employees per kilometre<sup>9</sup>). Some estimations mention the sufficient number of just 2,000 employees,<sup>10</sup> 1,000 of whom in the tolling and 600 in the maintenance. The excess of the employees would receive a severance pay in the amount of 80 to 160 thousand HRK.<sup>11</sup>

The financial plan of the restructuring has, so far, been available only for the HAC operations (Group of Advisors, p.78). The three-year-long plan includes potentially around 400 employees fewer, which results in the saving of 77 million HRK per year, with the estimated restructuring costs (severance pays) of around 80 million HRK. The plan includes unexplained income increase in the same period of about 11%. Until this moment, the clear financial plans for the part governed by ARZ have not been presented to the public, even though there have been some unconfirmed media articles.<sup>12</sup> By all accounts, the reduction of the employees' number in the sectors for General Affairs and Support is currently being implemented as a result of uniting of ARZ and HAC. The smaller share of jobs like office cleaning is entrusted to external contractors. The number of employees related to tolling and maintenance would be modestly reduced. In the maintenance, a smaller range of jobs would be entrusted to external contractors, but the savings in that part have not been clearly estimated.

On the basis of the available data, we will start with the assumption that the current restructuring process could bring the operative costs to the level of 800 million HRK. Further possible savings will be proposed by the author in the section 6.1.

### **3 The current model of the motorways monetization**

#### **3.1 The advisor's report for the monetization of the public debt**

In the report (Group of Advisors), the goals set by the Ministry of Maritime Affairs, Transport and Infrastructure (MPPI) are stated: receiving income from the monetization, the improvement of the overall operational efficiency of HAC and ARZ (business optimization) and leaving the fuel tax, which provides income to HAC, for new investments. The monetization income could be used for the repayment of the outstanding debts of HAC and ARZ. The advisor thoroughly considered the following monetization options: concession, securitized (insured) bonds, management contract. The possibility of motorways privatization or the privatization of operators was initially rejected by the Government of the Republic of Croatia.

The managing contract is a monetization option where the motorways managing would be entrusted to external contractors. The operator would collect the income on the behalf of the Government of the Republic of Croatia and they would receive management fees. This monetization model was rejected by the advisor at a very early stage of the assessment of the options, so he did not do a market research for it. The stated reason for the rejection of this option was a low potential of the income realization. Apparently, the only income the Government of the Republic of Croatia would realize is related to the savings of the management expenses and the maintenance during the contractual period. The advisor did not try to

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<sup>9</sup> HAC-ONC, HAC Restructuring, 17<sup>th</sup> April 2013, taken from <http://www.hac-onc.hr/odnosi-s-javnoscu/novosti/restrukuiranje-hac-a>

<sup>10</sup> Podružnica Hrvatske autoceste, Union news No. 119, Independent road union, 18<sup>th</sup> January 2013

<sup>11</sup> Podružnica Hrvatske autoceste, Union news No. 120, Independent road union, 7<sup>th</sup> March 2013

<sup>12</sup> Večernji list, The Unified Roads will be Led by 3 Board Members, 6 Directors and 183 Different Chiefs, 16<sup>th</sup> October 2013

estimate the ratio between the mentioned savings and incomes.

The bonds secured by the toll income were rejected as a monetization option because they would not contribute to the increase of the operational efficiency (that stays in the public sector). It was estimated that there is the interest for the periods of 10 to 15 years, but no longer than that. The market research done by the advisor showed that this option is less interesting to the investors than the concession. Since these transactions are relatively rare comparing to concessions, there is a significant implementation risk and the investors contacted by the advisor showed somewhat less interest. The capacity of the bond market was not estimated because institutional investors were unable to express their intentions at such an early project stage. Only the maximum volume for the local distribution to the citizens was estimated at 1.5 billion HRK and the price of 6-6.5% with the adequate Government guarantees (7-7.5% without the guarantees). In the response to the advisor's inquiry, the interested investors estimated the discount income rate similarly as for the long-term concession (see below). In short-term, this option of the issuing of bonds brings the risk of the capacity limitations of the (especially local) market for the issuing of government bonds.

The opinion of the author of this article is that the option with the bonds secured by the toll income was not sufficiently explored. Specifically, in some public statements<sup>13</sup> there was a manifested interest of the Croatian pension funds in the participation in the monetization. Their capacities definitely surpass the mentioned maximum volume for the distribution to the citizens. The possible volume of the international financial institutions interest was also not estimated, even though, the interest of the European Bank for Reconstruction and Development (EBRD) and the International Financial Corporation (IRC) was mentioned on page 31. It is surprising that in the chapter on the concession option, in the same report, the funding is very thorough, in spite of similar limitations. The issuing of secured bonds definitely has the negative effect on the other country debts, but it was not quantified and the effects were not compared to the concession option.

The lease or concession of the motorway was suggested by the advisor as the most favourable monetization option. The proposal is based on the argument of great long-term benefit and the increase of the operational efficiency. The concession owner would pay a one-time fee and would receive the income from the motorway users with the obligation to maintain the infrastructure in a certain time period (30-50 years). By doing a market research, the advisor determined that the investors were interested in this transaction. The concession grantor (the Republic of Croatia) should prescribe the acceptable levels of the tariffs for the motorway use and the maintenance standards. The advisor advises the Government of the Republic of Croatia to support the transaction with the guarantees for the minimum traffic levels and exchange rate and with the guarantee for the debt collection in case of the violation of the concession and the protection against the country risk. Thereby, the risk would be reduced for the concession owner and, in return, the transaction price would be higher. The Government of the Republic of Croatia would also need to define the mechanism of the toll regulation and vouch that the future changes of the tax regulation will not negatively influence the concessionaire. The potential promise not to initiate any competitive road projects (ensuring monopoly) could also increase the concession price, but might not be necessary with the provided guarantee of the minimum traffic.

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<sup>13</sup> Jutarnji list, Pension funds want to give a billion HRK for the Croatian motorways, 22<sup>nd</sup> August 2013, Poslovni dnevnik/tportal.hr, Pensioners want a piece of the pie in the monetization of highways, 8<sup>th</sup> August 2012

The indicative assessment of the transaction value with the mentioned tools for the risk reduction for the concessionaire ranges from 17 billion HRK for the 30-year concession to around 23 billion HRK for the 50-year concession. The advisor got this sum by using the method of the net present value of the profit. The base profit was calculated from the total toll income ( $I$ ) in 2012 (see Table 1), reduced by 15% of the income (concessionaire's risk coverage) and by the managing and maintaining costs in 2012. The income reduction by around 15% is for the reason of covering the main risks that the concessionaire cannot influence. The advisor calculated the exact amount of the reduction by doing a market research. On page 61 of the abovementioned report, the advisor states the expectation that the concessionaire would reduce the managing and maintaining costs within 3 years, but he does not say in which amount. From the presented calculations, it can be estimated that the advisor expects the reduction within 3 years to be at the level of about 780-800 million HRK ( $E$ ). The used discount rate was determined by the weighted average capital cost  $r_K$  around 7.73% with the reduction on the income side (increase rate)  $r_I$  around 4.5% and the costs side (costs increase rate)  $r_E$  around 3.75%. To all appearances, the following base formula was used, adjusted by the restructuring in the first three years:

$$\text{Present value} = I \left( \sum_{n=1}^N \frac{(1 - 0.15)(1 + r_I)}{(1 + r_K)^n} \right) - E \left( \sum_{n=1}^N \frac{(1 + r_E)^n}{(1 + r_K)^n} \right) \quad (2)$$

The report of the monetization advisor includes the sensitivity analysis conducted by the method of Monte Carlo simulation by varying key risk variables. The simulation result is a distribution similar to the binomial distribution. The mean value corresponds well to the indicative value estimation. The expected value range is not well justified in the report, since it is based on the used probability distribution on the risk variables, which is not closely specified.

The large deficiency of the report is the lack of recommendations for the optimization of the motorways operations and the estimation of their financial effect. The advisor does not discuss the questions of HAC and ARZ operations nor the measures for the improvement of the operations. On the page 56 of the report, the possibility of the reduction of the employees' number was mentioned, as a measure that a concessionaire could apply, but its scope was not discussed. It was not specified how the estimation on the operation cost reduction was created, reducing the current 900 to the level of 800 million HRK. It could be inferred that it was created on the basis of the aforementioned incomplete restructuring plans. If the motorways operations were far from optimal, the indicative monetization amount was underestimated or, by the shown prices, the concessionaire would generate profit by the capital return rate substantially higher than 12% as it was presented.

The most banal mistake of the report is the omission to include in the total concession incomes ( $I$ ) all other incomes that would be collected by the concessionaire along with the tolls (compare p. 44, 60-62). In 2012, the other incomes in ARZ and HAC amounted to about 140 million HRK (see Table 1). It refers to the sub-concessions at the rest areas (petrol stations, restaurants), money collected from damages and fines, etc. It is expected that these incomes increase with the increase of traffic in the future. Furthermore, owing to the toll increase from 7<sup>th</sup> June 2012, in the first half of 2013 the motorways income increased for around 42 million HRK. Both corrections together increase the income ( $I$ ) and operative profit for about 182 million

HRK in the base year. By maintaining all other parameters used in the advisor's calculation, these income corrections, on the basis of the formula (2), increase the indicative monetization transaction amount for about 17%: around 19.8 billion HRK for a 30-year long concession and 26.5 billion HRK for a 50-year long concession.

Neither the potentials of the reduction of the expenses were estimated nor the potentials of the income increase, even though the advisor expects that the concessionaire will try to optimize the toll tariffs within the framework defined by the concession grantor. This is a significant imperfection since, according to the calculation parameters (formula (2) and the initial parameter values), the income increase of 3% increases the concession value by about 5%. The given advice for a very long concession period is based on the exploiting of the economies of scale and reasonable transaction value. However, these parameters are not used in the estimation method, thus the advice is insufficiently explained. The argument for the great long-term benefit, which the recommendation for the concession as the best monetization option was based on, is not clarified anywhere. The monetization was examined from the viewpoint of the generic owner of the optimally productive property, while in this case there is a significant public interest (externalities), which is not estimated. The point is that the advisor, at this stage, left all concession parameters to the owner to decide, so, in the report, he does not provide any guidelines and clarifications of the influence of certain significant conditions of the concession contract to the amount of transaction and public benefit: e.g. maintenance conditions. The quantification of the risk taken by the country is lacking: e.g. the minimum traffic risk.

### **3.2 The weaknesses of the proposed monetization model**

As it was pointed in the report (Group of Advisors, p. 40), the monetization as a change in the motorway concession holder leads to the transfer of all credit obligations of HAC and ARZ into the public debt. In that case, all clauses on the automatic maturity of all credit liabilities apply. The Ministry of Finance can try to negotiate with the existing creditors to continue the repayment of the current credits of HAC and ARZ by the terms and conditions valid before the monetization. If those negotiations are completely successful, then the monetization of 23 billion HRK would have the effect of net inflow to the state budget in 2014 of about 15 billion HRK (the remaining part would be used for the return of around 8 billion HRK of matured and current liabilities of HAC and ARZ) and the public debt increase for the remaining at least 23 billion HRK with interest rates from the existing credits of HAC and ARZ. In this case, the beneficial short-term effect to the borrowing possibility would be achieved, because in 2014, it would be necessary to borrow only about half of the planned amount, which can result in lower interest rates on those debts.

At worst, if the creditors insisted on the repayment of the whole debt of HAC and ARZ, then the net effect (with the mentioned abandoning of investments) would be the budget expenditure of 8 billion HRK in 2014 and, at the same time, the public debt increase for the same amount with the interest rates that need to be agreed at the market at that point. However, that is almost identical to the indebtedness necessary to cover the debts of HAC and ARZ due in 2014, so the monetization, as it is suggested, cannot ruin the possibility and conditions of the borrowing by the treasury in 2014. Nevertheless, the public debt increase remains. In case the country keeps the concession through HAC and ARZ, undue debts of HAC and ARZ would not enter into public debt calculation and the operations, owing to the interest decrease and possible

restructuring, could long-term generate some income for the state budget.

Freight traffic is often the leading motorways income generator in the European practice. The section of the Croatian motorway A1 leading from Zagreb to the south is at the moment of especially weak traffic intensity, among the others of freight traffic as well. One of the reasons could be that this long section is not a part of the European traffic corridors. By the realization of the Adriatic-Ionian motorway (Ivančić, 2003), the section A1 would record the significant increase in the freight traffic, because it would become a part of the shortest traffic connection between West-European countries and Montenegro, Kosovo, Albania, Macedonia and Greece. For the realization of this project it is necessary to include this direction into the list of European corridors, to which the active lobbying of Croatia and other interested countries would contribute. It can be expected that the Government of the Republic of Croatia would be long-term active in the realization of the project if it had a clear financial interest in the profit generated from the motorways concession. The indicative monetization representation that the advisor provided did not take into the consideration the possibility of the traffic increase due to the realization of this project.

As mentioned, the possibilities of further business optimization were failed to be examined, e.g. the possibility of the implementation of a public tender for the motorways maintenance, the HACONC privatization or the entrusting most of the maintenance to the external contractors, etc. The indications and the publicly stated suggestions from traffic experts that the change of the tolling system and the construction of the additional junctions could have a significant financial and traffic effect (Dadić & associates, 2008) were ignored. The author considers that the Government of the Republic of Croatia should have also examined the other adequate possibilities of the public property monetization (see the section 3.4).

The report (Group of Advisors) does not question the goals set by the Government of the Republic of Croatia, nor does it compare the monetization with the present value of operations. The question is which internal rate of return would be suitable for the cash flow that can be generated by the motorways operating business in the next 50 years, when it includes initial outlay of 23 billion HRK. In other words, how big is the effective interest rate on the debt that is suitable for the monetization amount for a period of 50 years with instalment payments suitable for the cash flow of the motorways operations? The answer is in the Table 3.

Table 3. Internal rate of return

Internal rate of return in %		Operating incomes and expenses in the base year of the monetization (million HRK)									
		Incomes	1,800			1,950			2,100		
		Expenses	800	700	600	800	700	600	800	700	600
Monetization											
Amount (billion HRK)	Duration (years)										
<u>17</u>	30		9.4	10.1	10.9	10.6	11.3	12	11.7	12.4	13.1
	40		10.4	11	11.6	11.4	12	12.7	12.4	13.1	13.7
	50		<b>10.8</b>	<b>11.4</b>	<b>12</b>	<b>11.8</b>	<b>12.3</b>	<b>12.9</b>	<b>12.7</b>	<b>13.3</b>	<b>13.9</b>
<u>20</u>	30		8	8.7	9.4	9.1	9.8	10.4	10.2	10.8	11.4
	40		9.2	9.7	10.3	10.1	10.7	11.2	11	11.6	12.1
	50		<b>9.7</b>	<b>10.2</b>	<b>10.7</b>	<b>10.5</b>	<b>11.1</b>	<b>11.6</b>	<b>11.4</b>	<b>11.9</b>	<b>12.4</b>
<u>23</u>	30		6.9	7.6	8.2	8	8.6	9.1	8.9	9.5	10
	40		8.2	8.7	9.3	9.1	9.6	10.1	9.9	10.4	10.9
	50		<b>8.8</b>	<b>9.3</b>	<b>9.7</b>	<b>9.6</b>	<b>10.1</b>	<b>10.5</b>	<b>10.4</b>	<b>10.8</b>	<b>11.3</b>
<u>26</u>	30		6	6.6	7.2	7	7.6	8.1	7.9	8.4	8.9
	40		7.4	7.9	8.4	8.3	8.7	9.2	9	9.5	9.9
	50		<b>8.1</b>	<b>8.5</b>	<b>9</b>	<b>8.8</b>	<b>9.3</b>	<b>9.7</b>	<b>9.5</b>	<b>10</b>	<b>10.4</b>
<u>30</u>	30		5	5.6	6.1	5.9	6.5	7	6.8	7.3	7.8
	40		6.6	7	7.5	7.3	7.8	8.2	8.1	8.5	8.9
	50		<b>7.3</b>	<b>7.7</b>	<b>8.1</b>	<b>8</b>	<b>8.4</b>	<b>8.8</b>	<b>8.7</b>	<b>9</b>	<b>9.4</b>
<u>33</u>	30		4.4	4.9	5.4	5.3	5.8	6.2	6.1	6.6	7
	40		6	6.5	6.9	6.8	7.2	7.6	7.5	7.9	8.2
	50		<b>6.9</b>	<b>7.2</b>	<b>7.6</b>	<b>7.5</b>	<b>7.9</b>	<b>8.2</b>	<b>8.1</b>	<b>8.5</b>	<b>8.8</b>
<u>36</u>	30		3.8	4.3	4.8	4.7	5.2	5.6	5.5	5.9	6.4
	40		5.6	6	6.4	6.3	6.7	7	6.9	7.3	7.7
	50		<b>6.4</b>	<b>6.8</b>	<b>7.2</b>	<b>7.1</b>	<b>7.4</b>	<b>7.7</b>	<b>7.6</b>	<b>8</b>	<b>8.3</b>

The internal rate of return (IRR) in the cell of the table body corresponds to the investment in the monetization amount (left) and the cash flow generated from the investment during the period of the monetization (left).

The cash flow corresponds to the incomes and expenses in the base year stated in the column header and they increase in the duration of the investment at the rates as in (Group of authors, 1993). Unlike the formula (2), the incomes do not get reduced by the covering of the concessionaire's risk. IRR in percentage corresponds to the effective interest rate of the credit that could finance the investment. In the light of the monetization, not considering the risks, bonds are a better option when the paid price is below the one shown in the table. With operative costs in the base year of 800 million HRK (that correspond to the restructuring expectations), income of 1.95 million HRK (previously expressed data correction with regard to (Group of Advisors)), the monetization amount of 23 billion HRK for the 50-year long period corresponds to the indebtedting at the interest rate of about 9.6%, when one assumes the increase of income

and expenses as in (Group of Advisors). For the sake of comparison, according to (Bajo & Primorac, 2013) the highest indebtedness of the Republic of Croatia in bonds until now was in 1999 and it was about 7.4%, whereas the average indebtedness cost was about 5.6%.

The report (Group of Advisors) expects the discount rate on the concession income to range from 10 to 30% if the Government of the Republic of Croatia provides certain guarantees and more than 30% if the guarantees are not provided. The provided guarantees are a significant part of the monetization conditions. According to the report (p. 61) the traffic increase at the motorway is connected to the increase of GDP. If the Government provides the guarantee for the traffic levels, it gives credence in the long-term economic growth. The long-term economic growth would have the expected consequence of strengthening the public finances and the reduction of the interest rate on the public debt in the long-term period. In that case, it would prove as justified to accept the currently higher costs of the credit indebtedness on the bonds market and later to refinance the public liabilities under the better conditions. Otherwise, with the expressed doubt in the long-term economic growth, it would be consistent to highly evaluate the risk guarantee for the traffic level (Table 4).

The large disadvantage of the report (Group of Advisors) is that, with the indicative monetization amounts, it did not evaluate the risks that the Government of the Republic of Croatia would take. For instance, the events such as the oil crises in 1973 and 1979 can cause the realization of the traffic risks taken by the Government of the Republic of Croatia, especially in the concession's long period of 50 years. (Nunez, 2007, p. 41) warned about the unpredictable risks of sudden changes of the factors that are not under the control of the country, nor the concessionaire, but that can significantly influence the volume of traffic.

The limitations of the future operations that the Government of the Republic of Croatia undertakes carry the opportunity cost that was not evaluated. The ensuring of the monopoly on the motorway's sections that the Republic of Croatia grants to the concessionaire can prove to have a significant weight at the future decisions in the long concession period. For instance, guaranteeing monopoly of the section A1 to the concessionaire can obstruct the construction of a better road infrastructure or solving the traffic issues on the sections with the high intensity of local traffic from Zadar through Biograd, Vodice, Šibenik, Trogir, Kaštel, Solin, Split and Omiš (which the current motorway cannot adequately meet), since that route, in its full length, would indeed take a part of the transit traffic currently directed at the motorway.<sup>14</sup>

The traffic safety on the roads is one of the main aspects of their usage that directs at the reduction of the consequences of the road traffic to the life and health of people. The accepted safety standards change through time which is connected to the investments in the current road infrastructure. The technological changes and their consequences are generally hard to predict (Schnaars, 1989, page 41). We should also take into consideration the information that the density of the public roads network in Croatia is significantly lower than in the developed European countries (Institute for Tourism, 2011, p.7) and that the strategy of the traffic development in the Republic of Croatia was made in 1999 for the period of following 20 years. Interventions in the road infrastructure in the long period (e.g. 15 years) are inevitable. The obligations that the country takes now concerning this could become an obstacle to the realization of the future goals of traffic connection. For the future newly-constructed motorway sections, the country will be

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<sup>14</sup> Croatian Chamber of Economy, Croatia – the society and the country of welfare, Zagreb, September 2011 (see pages 117-118)

directed to cooperate with the existing concessionaire, which could decrease the public benefit from these projects.

**Table 4.** Outcomes matrix (GDP movement)

<b>GDP</b>	<b>Monetization</b>	<b>Bonds</b>
<b>Growth</b>	Neutral	Opportunity for better refinancing
<b>Stagnation</b>	Threat of risk realization	Threat, harder refinancing

### 3.3 Other possible monetization models of the public property

The current problem of the over-indebtedness of HAC and ARZ, because of the country's guarantees, has become a part of the problem of the huge public debt and therefore the imposing of the framework for its solving within the motorways operations and property is both unnecessary and harmful. It is multiply more useful to expand the tools set that can be used for the reduction of the public debt and to consider the other possible monetization models of the public operations and property. The key problem of inefficiency is mutual for nearly all public sector activities in the Republic of Croatia. It is shown that the Government of the Republic of Croatia starts worrying about the inadequate profitability of operations only when the refinancing of the liabilities becomes impossible due to the excessive credit load. Increased credit load usually appears after the phase of reckless investments financed by credit obligations and the problems occur at the moment of the maturity of the credit principal in the conditions of the financing market contraction. Bad investment decisions repeat due to the lack of clearly set rules for analyzing their purposefulness and feasibility, like (HM Treasury, 2011). The author thinks that the public system is, too often and without the thorough analysis of effects, used as inappropriate mechanism of social policy.<sup>15</sup> In the absence of capabilities and expertise, the concession to the private partner can contribute to the economical management of the public property. The same as with the motorways, public interest should be clearly expressed in that process. Shorter duration of the concession, as shown in the section 4.2, largely reduces the public risk and it should be preferred.

According to the findings by the state audit, Croatian Lottery Ltd. (Hrvatska lutrija d.o.o.) (owned by the Republic of Croatia), the largest organizer of the games of chance in the country, is not liquid, does not operate economically and is over-indebted.<sup>16</sup> The lottery tickets<sup>17</sup> of the amount of around 600 million HRK in 2012 provided budget revenues lower than 84 million HRK.<sup>18</sup> According to the research (Hansen, 2004) in the USA, the country averagely retains about 73% of the lottery amount. The author, therefore, estimates the potential of the public revenues from the lottery in the Republic of Croatia to around 450 million HRK per year, that is, in case of 5-year long monetization, around 2 billion HRK.

The balance sheet of Croatian Electricity (Hrvatska elektroprivreda - HEP) joint stock company consists of 35 billion HRK of assets and 19 billion HRK of equity, while annual incomes are around 14 billion HRK. A recent research (Bukša, 2010) expresses doubts in the management efficiency. Based on the comparison

<sup>15</sup> Novi list, Komadina: We will Turn the ARZ Debt into the Public Debt, 4<sup>th</sup> January 2012

<sup>16</sup> The State Audit Office of the Republic of Croatia, Audit report on the Croatian Lottery Ltd., November 2013

<sup>17</sup> Croatian Lottery, Annual business plan of the Croatian Lottery Ltd. for 2013, May 2013 (see page 7)

<sup>18</sup> Croatian Lottery, Annual report on the state of the company Croatian Lottery Ltd. for 2012, May 2013 (see page 27)



with the market value and the parameters of income, equity and assets of the French electricity operator Electricite de France SA, the author estimates the market value of HEP at between 15 and 30 billion HRK. The author estimates<sup>19</sup> that it is possible to provide 1 to 2 billion HRK of additional public revenue from HEP per year or by the five-year long monetization, with the privatization of a part of production portfolio, at least 5 billion HRK.

The estimations in this chapter are not intended to be thoroughly explained because they serve to point at the other possibilities of the solving of the public debt problem, with the reduction of the risk that the Republic of Croatia is exposed to. There are a number of public companies<sup>20</sup> and the companies with public authorities that can help improve the state of public finances, with the risks that are lower or comparable to the risks that occur during the motorways monetization.

### **3.4 Interrelationship between the monetization stakeholders**

In this section, the arguments will be presented that indicate that the Government of the Republic of Croatia is, at least partially, aware that the planned motorways monetization is not the solution to the task given in the formula (1) from the chapter 2.2, but that it is trying to present it as such. It is understandable that the stakeholders of the motorways problem, marked by  $x$  in (1), are organized in groups that have the interest to promote such function  $D$  that maximizes precisely their benefit from the motorways  $D(x)$  (the effect of the reference of a personal gain over public interest). The short-termed sentiment of the stakeholder  $x$  is mostly connected to the change in the motorways benefits arising from the change of the function  $D$  during solving of the task (1). It can be interpreted that such a negative sentiment of the electorate that needs to be overcome in order to achieve long-term results, discourages the politicians to solve the task (1). Therefore, the actions of the state authorities that we will describe can be understood as the preference of the short-term effect (the lack of delayed gratification).

The messages regarding the motorways monetization that the ministers of the Government of the Republic of Croatia communicate via public media can be summarized to the following:<sup>21</sup>

- public debts in 2014 with the expected interest rate of 5-7%, with no space for covering the HAC and ARZ debts that mature
- the inflow of monetization funds will be used for the return of bad debts, some of which have the interest rates of 9-10%
- with the monetization, the public debt would reduce for even about 15%

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<sup>19</sup> The network of electricity transmission requires significant regulation, represents a natural monopoly and is carried out for the first time, so the risks are similar to the motorways monetization. In order to reduce the risk, when granting the concession, the shorter duration should be preferred (e.g. 5 years). The transfer of property rights or the right for the control over electricity production capacities represents less risk for the public benefit. If the market competition is ensured, the necessary regulation and the state risks are fewer than at the system of energy transfer. There are international experiences and, for some time, there is a state agency that deals with the regulation of this market. Privatization or concessions (monetization) is possible for a long period. Due to the complexity of management and the relations with the neighbouring country which is a stakeholder, the nuclear power plant Krško could be an exception. The public interest for the retaining of the ownership over the energy supply (sale) to the end users is very little, so there are no obstacles to the sale of this HEP segment. Since there are no new investments necessary, the model proposed by the author at the end of this paper can be used.

<sup>20</sup> The Ministry of Finance, Financial reports – public companies – 2012, <http://www.mfin.hr/hr/financijska-izvesca-javna-poduzeca-2012>

<sup>21</sup> [www.vlada.hr](http://www.vlada.hr), Minister Slavko Linić for Globus : I expect that the investments into railroads will be the initiator of the series of productions, as it was with the motorways, 6<sup>th</sup> November 2013; Večernji list, Hajdaš Dončić: Either the motorways monetization or the pay and pension cuts, 22<sup>nd</sup> August 2013; Ministry of Maritime Affairs, Transport and Infrastructure (MPPD), The Proposal of the Comprehensive Response to a Parliamentary Question about the Feasibility of the Privatization of Motorways, CLASS: 013-01/12-01/87; REG. NUMBER: 530-05-12-6; 22<sup>nd</sup> November 2012

The common for all statements is the message that the monetization is a necessary and purposeful measure for the improvement of the public finances. The positive effects of the monetization are emphasised, such as a cash inflow, the reduction of the public debt and new debts. Some parts of the messages on the monetization effect are exaggeration. For instance, the return of the bad debts does not require the monetization, but the credits can be rescheduled with the more favourable interest rate that is mentioned. Since the budget will be in deficit in 2014, even with the implementation of the monetization, it is more appropriate to claim that the monetization funds will serve for the less borrowing necessity and greater budgetary spending than that it will serve for the return of debts. As it is mentioned in the section 2.1, the author considers that the statements on the public debt reduction by the monetization are not consistent with the truth.

The Government of the Republic of Croatia, as the key decision-maker, avoids the public debate on the motorways operations, i.e. it presents one model as the best. Moreover, the information that could enable the questioning of the made decisions are tried to be kept far from the public. For instance, the report (Group of Advisors) was published to the public only after the pressure and requests from the civil society organizations, but only on the last day of the legal deadline for the publication of the requested information and four months after the report date. What is more, the complete documentation of the tenders, the signed contracts and the new reports demanded from the monetization advisors<sup>22</sup> are not publicly available. According to the (Carlson & Heth, 2010), the mentioned procedures correspond to the cognitive dissonance as a decision-making consequence: the decision was made and the rejected decisions have more positive aspects or cognitively concur with the made decision.

Some interest groups are very small, but they have a large influence on the owner. The smallest, but very influential interest group is the Management (and the former ones) of HAC and ARZ. Their influence arises from the close contact with the owner. The owner frequently asks from the Management the first comment on possible actions and the Management interest do not need to coincide with the owner's interests. The managing staff has a financial position that is above average and that they aim at keeping. It is the interest of the managing staff (even the former one) to present their managing as successful, since good references improve the position on the labour market. The effect of the non-refundable cost is widely known, by which the persons who made the decisions regarding a way of doing business persist with the stand that it should be continued with the same way even after it is shown as optimal to replace the existing managing way with the another (Bokulić & Bovan, 2013), with the argument that many funds have already been invested in a certain technology of a long-term decision (Staw, 1976). The managing staff, just like all employees, can prefer current and known technologies and the ways of doing business to avoid the stress related to learning and running-in of new processes (see the chapter 5.1.3). Thus, in the contact with the owner, they prefer offering the advice which will keep the current state. The management is under the effect of the Government, as well, by which it is resisting the reducing of powers and the management scope. Therefore, the resistance that can appear on restructuring, business unification, granting the (part of) the business under concession, the decrease of workload and the number of employees is understandable.<sup>23</sup>

Croatian Association of Toll Motorways Concessionaires (Hrvatska udruga koncesionara autocesta – HUKA, ASECAP) has as its main objective the promotion of the interest of the motorways concessionaires.

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<sup>22</sup> Jutarnji list, We discover the new Government motorways plan, 7<sup>th</sup> January 2014

<sup>23</sup> Večernji list, Hajdaš's Purge: the Removal of the ARZ and HŽ Cargo Management , 30<sup>th</sup> October 2013

Its interest is to present the motorways concessionaires and the concept of the motorways funding in a good light. Relating to HUKA, the concessionaires' management has a great influence, thus the interests of some concessionaires' management, including the management of HAC and ARZ, can be projected through the attitudes and the activities of this organization.

The interest group of employees (represented by a union) prefers the business stability and the maintaining of the present state and the announcement of a change, which abounds in unknowns, causes their concern. The reduction of the volume of business and the number of employees leads to the dissatisfaction of this interest group. This group prefers the less usage of the external contractors since that is deepening the excess of employees in the parent company. It can be politically destructive to the Government of the Republic of Croatia to oppose to the loud and organized employees' corps when it does not expect the clear short-termed benefits from the implementation of changes. Certain actions of the Government of the Republic of Croatia, like the expected demand for the maintaining of the certain number of employees, can be interpreted as the trading the public interest (higher monetization level) with the low employees' resistance (Group of Advisors, page 11 and 29).

The carriers and their associations (Association of Croatian Road Carriers, Guild of Carriers of the Croatian Chamber of Crafts, etc.) find their interest in the reduction of the costs of the freight transport. The lobbying is obvious when advocating lower rates for using the goods vehicles. The implementation of their interests is less obvious on advocating lower tariffs for the frequent motorway users. However, the local carriers are the most frequent motorway users, which could in that way gain an advantage over foreign carriers or the others who use the infrastructure less frequently. They strengthen their relation to the country as the infrastructure owner by acting through the economic associations (HGK and HOK), and they approach the Government of the Republic of Croatia in a usual way, through the Ministry of Economy.

The interest group of the drivers of smaller transport vehicles is organized by smaller or larger auto clubs (HAK). It finds its interest in lower prices, higher safety and the long-term development of the road traffic. Their representatives in some expert bodies act in accordance with the Ministry of Interior, so they can try to promote their interests through it. Their interest is the higher traffic safety and the lower toll for the local drivers. Traffic and economic experts are perceived by the public as independent commentators of the motorways operations. The expert public can have divisions and different theories and opinions, so the experts can use the public focus to promote their theories and opinions. Taxpayers in the Republic of Croatia have the interest in the reduction of the taxes – they prefer to transfer the motorway costs to the foreign citizens that use the motorways: transit traffic through Croatia and tourist traffic in Croatia (Levinson, 1998, p. 1-3).

#### **4. The evaluating of the public risks associated with monetization**

##### **4.1 Some former Croatian experience in public-private co-relation in the partnerships of great value**

There are two motorways concessionaires in Croatia that are under the control of a private owner: AZM and BINA. In this section, we will examine the development of the relation between the country and the private partner on the example of those two concessionaires and the example of the cooperation in the

ownership of the large Croatian oil company INA. It is common for all examples that, over time, there is a change of relations between the partners. The country in the long term changes the criteria and wishes regarding the project. The private partner can maintain its financial interest in the partnership by the management control, preserving the acquired positions and business with the parent company. The management control can be used to, beyond market conditions (without a tender), entrust a part of the works in the partnership precisely to the private partner. The paper (Johnson and associates, 2000) calls that tunnelling: e.g. construction works, consultant services, etc. The private partner can find its interest in the withering away of a part of the partnership which competes with the parent company. The data sources in this chapter are financial reports and others specified in the footnotes and tables.

#### **4.1.1 Bina – Istra, joint stock company**

BINA<sup>24</sup> is a public-private partnership between the Republic of Croatia and the French company Bouygues T.P. The French company Antin Infrastructure Partners has a small, but controlling influence and some smaller domestic companies have a smaller share. The company is controlled by Bouygues and Antin. In 1995, BINA got a concession for construction, maintenance and tolling of 141 km of motorway in Istra for 32 years, including the existing Učka tunnel. The concession contract was changed four times. The first time, in 1999, the country, as the grantor, wanted to abandon the closed tolling system, and it granted annual financial transfers to BINA in return. When the concessionaire, owing to the improvement of market conditions, managed to agree the better credit terms in 2003, the country received a promise for the return of a part of the financial aid when (and if) the project becomes financially viable. In 2008, the country wanted, in spite of low traffic, to encourage the construction of the full motorway profile. The concessionaire was able to return to the closed tolling system and continued receiving the financial aid from the country.

In 2012, BINA had a total income<sup>25</sup> of 364 million HRK, of which the tolling<sup>26</sup> contributed with 183 million HRK. The large part of the income is the state aid; one source<sup>27</sup> mentions the amount of 130 million HRK for 2011, the other<sup>28</sup> mentions that in the 32-year long concession, the country would have to pay to the concessionaire around 3.2 billion HRK. On the basis of the concession contract, BINA is neither subject to VAT nor to the income tax in the first 14 years of the concession. In 2010, the owners turned the part of the equity into a non-interest subordinated debt, whose principal is returned in instalments, starting from 2012.

In one press release,<sup>29</sup> the Management of BINA mentioned that the French Bouygues counts on the profit from the entire project, on the equity rate of return of around 7%. Bouygues performed the design and the construction works on the motorway under BINA concession, so most investments into the value that is estimated at total amount of 7.5 billion HRK and it annually receives the compensation for technical support and the return of the principal of the subordinated debt. In 2012, BINA paid to Bouygues about 36 million HRK and in 2011 around 515 million HRK (the year of the motorway extension).

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<sup>24</sup> [www.bina-istra.com](http://www.bina-istra.com)

<sup>25</sup> FINA, Consolidated financial report Bina-Istra joint stock company with the auditor's notes for 2012

<sup>26</sup> National motorways report for 2012, Croatian Association of Toll Motorways Concessionaires, April 2013

<sup>27</sup> Glas Istre, Unquestionable continuation of the construction of the Y, 14<sup>th</sup> October 2011

<sup>28</sup> Večernji list, By the motorway to the millions: Istra's Y is the French business of the century, 2<sup>nd</sup> March 2011

<sup>29</sup> [www.ipres.hr](http://www.ipres.hr), Istra's Y is the French business of the century, 2<sup>nd</sup> March 2011

**Table 5.** The comparison of the state aid to the motorways concessionaires in the Republic of Croatia (according to the financial reports available in the public registry of the financial reports of FINA)

Concessionaire	The estimation of the state aid in 2012	The motorway length	Aid / The motorway length
BINA*	around 130 million HRK	around 141 km	around 0.9 million HRK / km
AZM**	around 79 million HRK	around 59 km	around 1.3 million HRK / km
HAC***	around 1400 million HRK	around 868 km	around 1.6 million HRK / km
* does not include the benefits to BINA of the exemption from VAT ** does not include the benefits to AZM of the tolling VAT refund *** pays VAT			

By the public-private partnership Bouygues ensures incomes, through which it can compensate for the lack of the profit generated through the BINA ownership. The project that started with the idea that the country only grants the concession has changed over time to the extent that the country now gives considerable direct aid.

#### 4.1.2 Motorway Zagreb – Macelj Ltd. (AZM)

AZM is a private-public partnership for the motorway construction and managing between the Republic of Croatia (49%) and indirectly Austrian Strabag (51%). The Framework Agreement was signed<sup>30</sup> in 1997 and the concession agreement for a 28-year long period in 2003. The details of this and every agreement that followed are not known to the public and it is indicative that all decisions are made in closed sessions of the Government of the Republic of Croatia. The idea of the country to avoid giving state guarantees for the financing of the motorway construction and to finance the whole project in a single payment was clear from the beginning. Even though the details are not known, it seems that the Republic of Croatia committed to invest in AZM only about €15 million of the share capital in cash (the same as the private partner) and insert the previously completed motorway sections.

Already in 2004, the concession agreement was changed<sup>31</sup> so that the Republic of Croatia was obliged to pay €23.5 million, take the risk for the non-realization of the predicted traffic increase and pay for all additional works. The Republic of Croatia also returns the paid toll VAT to AZM. Banks lent to AZM around<sup>32</sup> €320 million. The construction works worth €280 million were entrusted to Strabag, which

<sup>30</sup> Poslovni dnevnik, Strabag expensively paid for the change of the contract Zagreb-Macelj, 29<sup>th</sup> October 2009

<sup>31</sup> MPPI, Motorway Zagreb – Macelj – general data (presented during the signing of the amendments to the concession agreement), 20<sup>th</sup> July 2004

<sup>32</sup> The State Audit Office of the Republic of Croatia, The report on the performed audit of the Motorway Zagreb – Macelj Ltd., 2007 (see page 4)

constructed the motorway through Croatian sub-contractors by the mid-2007. The managing and maintaining of the motorway was entrusted to the operator owned by the French group Egis. In the meantime, during 2006, the country decided to decrease the tolls compared to the existing concession agreement, so it was obliged to pay a new compensation to the concessionaire. Then, in 2008, both the Republic of Croatia and the private partner granted the subordinated loan to the concessionaire because of the liquidity difficulties, in the amount of €9 million, with the interest rate of 9%. Because of breaching of some financial parameters undertaken towards the creditors, AZM could not pay dividends, principals, interests and concession fees to the shareholders until the end of 2011.

In the financial report<sup>33</sup>, during 2011 and 2012, the receivables from the country on a single payment basis were mentioned: the change of the main project, the project design for noise protection, the passing of NATO and EUFOR vehicles and the vehicles for the disabled persons. Apart from that, only in 2012, the country co-financed AZM with about 48 million HRK for the consensual VAT refund and the mentioned toll decrease. At the same time, the Republic of Croatia received an income of 6 million HRK from AZM. On the other hand, the private partner did not co-finance AZM in 2012 and received an income, through affiliates, of 29 million HRK (intellectual services and further developing of the motorway, among other things). Since in 2012, the conditions for the realization of the country's guarantee of the minimum traffic occurred, AZM exercised the right to the compensation of about 37 million HRK. Net state donations are estimated in the Table 5.

#### **4.1.3 INA – Oil Industry joint stock company**

INA is the largest company listed in the Zagreb Stock Exchange, with the capital<sup>34</sup> of about 15 billion HRK. The main activities are exploration, extraction, processing and retailing of oil and oil products. Initially, in 2003, the country sold around 25% of the ownership to the Hungarian oil company Mol Hungarian Oil and Gas plc (MOL), and, since 2008, the Republic of Croatia has had only around 45% of the ownership and the Hungarian oil company MOL around 47%.

The relation of the two partners was changed by the shareholders agreement in 2009. By that, MOL gained control over operative business of INA and started consolidating it in its business books. After that, the development of the refineries in Rijeka and Sisak was considerably slowed down or stopped. One of the reasons can be the proximity of the refineries owned by MOL that are direct competitors. In addition, MOL tried to cheaply purchase from INA the rights to valuable oil fields,<sup>35</sup> but, because of the resistance of the Republic of Croatia, it did not succeed in that. The Government of the Republic of Croatia did not fulfil the obligations of taking over INA gas business because it saw that it would take over significant financial burdens. Already during 2010, disagreements arose between the partners, as evidenced by the numerous media reports.<sup>36</sup> In the end of 2010, MOL tried to get to 50% of the equity shares in INA on the open market, but failed.

<sup>33</sup> FINA, Financial report 2012 – Motroway Zagreb – Macelj Ltd. (see page 35)

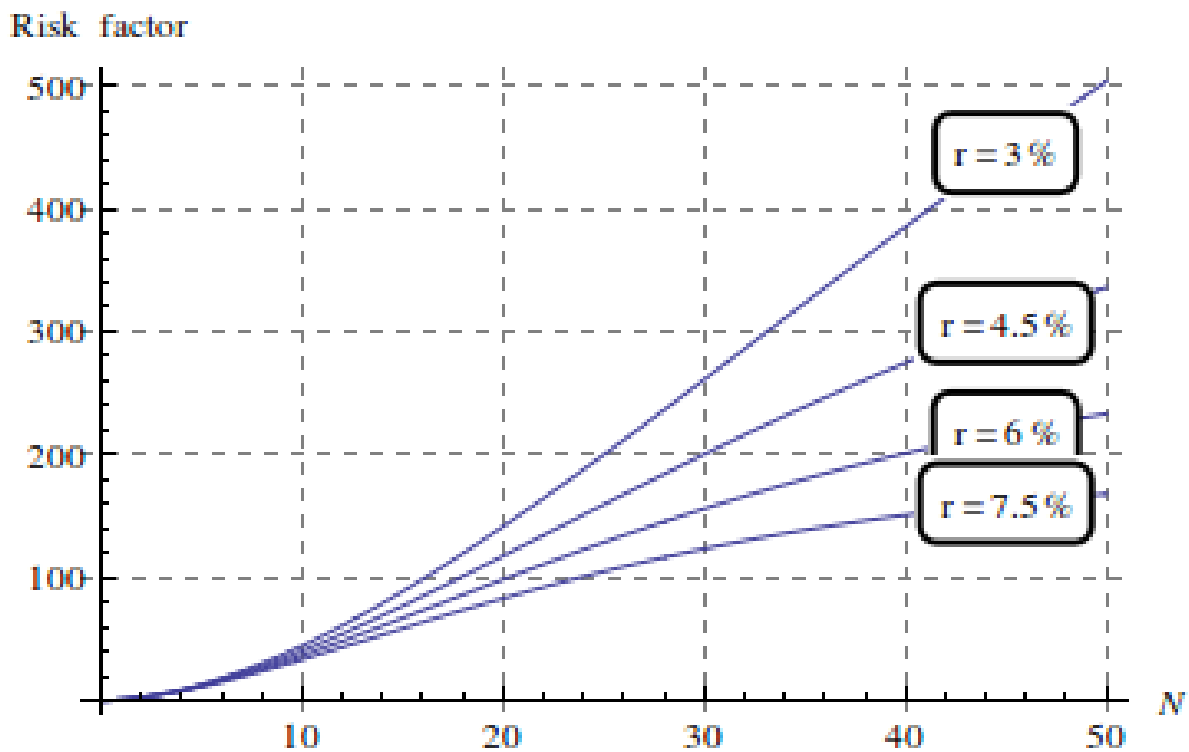
<sup>34</sup> INA, Annual report 2012

<sup>35</sup> Večernji list, MOL knew about the secret of Syrian fields while entering INA?, 21<sup>st</sup> January 2012

<sup>36</sup> Poslovni dnevnik, Šuker: MOL will not get Hayan, nor more than 50% in INA, 10<sup>th</sup> January 2010; Croatian Parliament, The report on the work of the Investigative Commission for establishing the facts regarding the privatization of INA Oil Industry joint stock company and all agreements and annexes between the Government of the Republic of Croatia and the strategic partner Mol Hungarian Oil and Gas plc.

The representatives of the Government of the Republic of Croatia expressed their dissatisfaction with the attempt of takeover, established control of MOL over the management of INA and the unfulfilled plan of the investment in the refineries, whereas MOL was still dissatisfied because the Republic of Croatia had not taken over the gas business. The disagreements of the co-owners and the opposite perspectives on INA operations led to the beginning of negotiations in 2013.<sup>37</sup> However, the disagreements culminated to the point that the negotiations stopped and that MOL started the arbitration process before the International Centre for Settlement of Investment Disputes (ICSID).

The Picture 1 shows the monetization risk factor with the different discount rates  $r$ . The higher discount rates correspond to the expectations of the long-term instability of the public finances and the difficulties in borrowing, so the risk factor is lower. On the  $N$  axis the time in years is marked.



Picture 1. The monetization risk factor with the different discount rates  $r$

<sup>37</sup> The Government of the Republic of Croatia, The Negotiations Framework, the annex to the point 7 of the 107<sup>th</sup> Government session, 1<sup>st</sup> August 2013

#### 4.2 The risk estimation and the advice for its reduction

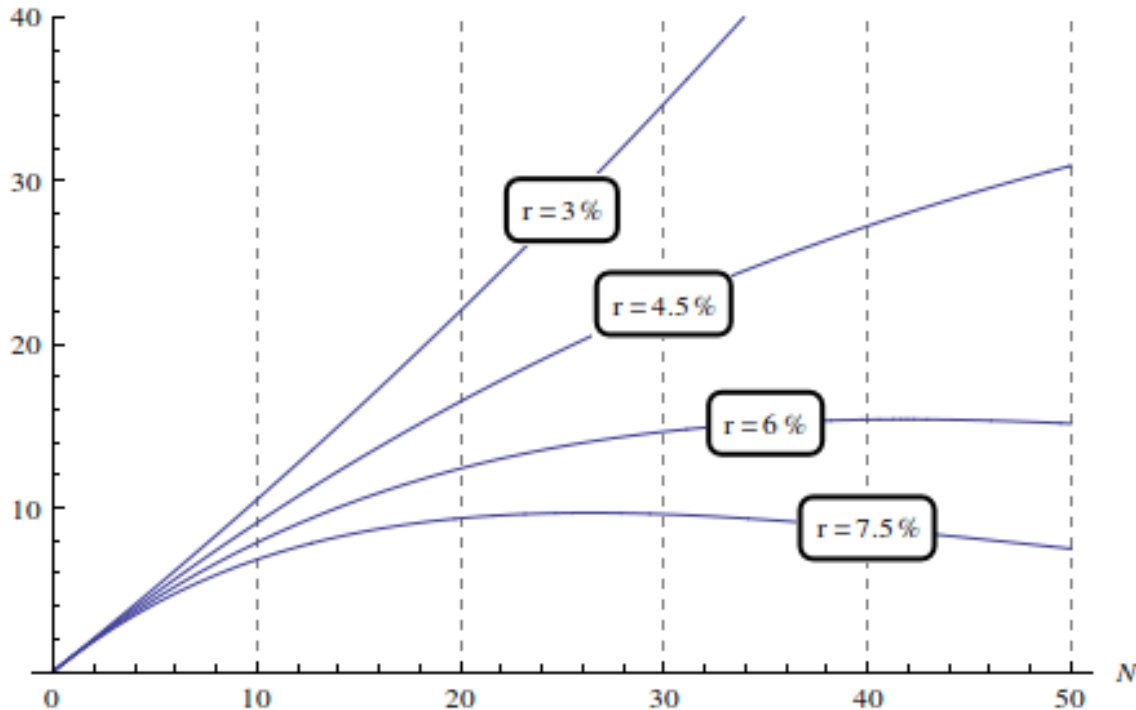
Based on the risks listed in the chapter 3.2 and Table 5 (that should be observed in the light of the length of the motorway granted under concession), the author estimates the annual cost  $v$ , in case of the risk realization, ranging from 200 to 500 million HRK. Based on the case studies of BINA, AZM and INA, the author estimates that there is 90% of probability that the risk gets realized at least once in 10 to 20 years from the contract conclusion, which corresponds to the probability of the risk realization on the annual level of  $p = 10\%$  to  $p = 20\%$ . On the basis of the same case studies and the nature of the risk, the author assumes that the cost  $v$ , once the risk is realized, burdens the public budget until the end of the contract period lasting  $N$  years. The author has taken into consideration that the private partner is better at the estimation of risk and that the country has a deficiency in the expert knowledge, which cannot be compensated by the purchased expert studies and consultants (the example of that is the unperceived mistake of about 17% in the advisor's calculation). The expenditure that occurs after  $n$  years is discounted by the rate  $r$ , so the expected net present value is related to the risk throughout whole contract duration.

$$\text{Present value} = \sum_{n=1}^N p \sum_{k=n}^N \frac{v}{(1+r)^k} = pv \frac{1+r - (1+r)^{-N}(1+r+Nr)}{r^2}. \quad (3)$$

The coefficient which multiplies  $pv$  depends on  $N$  and  $r$  and it is called the risk factor. The dependence of the risk factor on time is shown on the Picture 1. For example, with the discount rate  $r = 6\%$ , which corresponds to the present interest on the debt of the Republic of Croatia, and with the concession for  $N = 30$  years, the risk factor is around 150. In case of the expectation of the improvement of public finances of the Republic of Croatia for a long term, the lower interest rate and discount rate would also be expected, e.g. with the discount rate  $r = 4.5\%$  and concession duration of  $N = 50$  years, the risk factor would be around 350. On the basis of all that, the author estimates that the present value of the expected expenditure of the public budget that will arise as the direct consequence of the granting motorways under concession for the period of 30 to 50 years, is between 3 to 45 billion HRK. The estimation is indicative and it is possible to be improved when the details of the terms and conditions for the granting motorways under concession are known.

The Picture 2 shows the factor ratio of marginal values of risk and the monetization (left axis), with different discount rates  $r$  of the risk value, depending on the concession period  $N$ . Higher discount rates correspond to the expectations of the long-term instability of the public finances and the difficulties in borrowing. The used monetization discount rate is  $r_m = 3.5\%$





**Picture 2.** The factor ratio of marginal values of risk and the monetization, with different discount rates  $r$  of the risk value, depending on the concession period  $N$

For the purpose of the representation of the ratio between the expected marginal expenditure and marginal value, the marginal monetization value can be approximated as  $\partial_N PV_{monetization} \approx \frac{a}{(1+r_m)^N}$ , where the discount rate is  $r_m \in [r_K - r_I, r_K - r_E]$ , that is around 3-4%, with the annuity  $a \approx I(1 - 0.15) - \dot{E}$ . The factor ratio of marginal values of risk and the monetization, shown on the Picture 2, should be adapted to the factor  $pv \div a$ . More significant than the amount is the graph behaviour, which points that, with the expected stabilization of public finances and lower borrowing rates, the marginal risks grow in relation to the marginal incomes. Thus, in order to reduce the risk it is necessary to choose the shorter duration of the monetization. The extending of the concession duration contributes to the increase of the expected costs in relation to the expected benefits. Therefore, it can be concluded that, opposite to the advice from the (Group of advisors), it is recommended to choose shorter concession duration, in case of persisting with the concession as the monetization model.

## 5. Motorways operating profitability

### 5.1 The overview of the knowledge on the management of motorways

#### 5.1.1 Motorways maintenance

An open motorway, regardless of the traffic, demands certain maintenance: for example fire-fighters and winter service. The necessity for the renewing of the roadway due to wear and tear depends on the passage of time, quantity and the type of traffic. The classic theory connects the roadway wear and tear with the

fourth power of the load on the axle. The accepted parameters on designing a motorway calculate that a goods vehicle or a bus contribute to the roadway wear and tear as around 1,000 passenger cars (Group of Authors, 1993, p. D-25). For example, with the share of 90% passenger vehicles in the traffic, like on the motorways of the Republic of Croatia, it follows that the doubling of the traffic of passenger vehicles would speed up the roadway wear and tear for only about 1%, and the general maintenance costs for slightly more.

### 5.1.2 Traffic tolling

Tolling, though well-documented since 17<sup>th</sup> century (Levinson, 1998, p. 28-35), in the form in which we see it today, appeared after 1960. There are several reasons for tolling (Levinson, 1998, p. 4-14). The construction and maintenance of the infrastructure requires considerable financial resources. With no public funding, by tolling, the financial burden transfers from the taxpayer to the travellers using the infrastructure. The possibility of tolling depends only on the traffic position. The manager of a small section of main transit routes can substantially use their traffic position.<sup>38</sup> It is a known fact that smaller federal states in the USA through which there is a relatively high share of the transit traffic more frequently establish tolling than the larger federal states that are at the sources of the traffic flow. Therefore, the behaviour of the AZM concessionaire that manages the short section of the important European corridor can be better understood (Table 5).

There are known examples of the price reduction on the insufficiently used resources leading to the long-term higher utilization and financial viability. The prominent example is the Øresund Bridge connecting Denmark and Sweden, where the price for the frequent usage can be up to 80% lower than the price for the occasional users.<sup>39</sup> The bridge was completed in 2000 and, at the beginning, was not used as much as it was expected, but around 2005 the traffic suddenly increased. This coincides with the moment when the Danes started buying houses in Sweden to a greater extent (where the real estate prices were lower) and travelling to work in Denmark.<sup>40</sup>

The tolling reasons are sometimes based on the public costs caused by the traffic increase: e.g. inaccessibility of some locations at a certain part of day due to traffic congestions, various kinds of pollution (gas emissions and noise pollution) and the increased risks of traffic accidents (Walker, 2011). The regulation of traffic jams at certain places is the only reason for the tolls introduction.<sup>41</sup> The tolling requires certain technology and staff, thus increasing the costs of infrastructure management. According to the data published in 2010,<sup>42</sup> in Stockholm, London and Singapore, where toll was introduced in order to manage the traffic and reduce traffic jams, the tolling costs correspond to the part of as much as 20% to 50% of the collected income.

<sup>38</sup> If the concessionaire manages the section of the length  $X_1$  with the toll price  $C_1$  per distance unit, on a transit route that also includes distance  $X_2$  with the toll price  $C_2$  per distance unit, then their concessionaire income is  $X_1 \cdot C_1$  while the travel cost for the transit route user is:  $X_1 \cdot (C + C_1) + X_2 \cdot (C + C_2)$ , where  $C$  is the price of other travel costs by the unit of travelled distance (fuel, wear and tear, spending of time and depreciation). By the toll increase for a factor  $P$ , the concessionaire's incomes equally grow, while the costs for the road users increase for the factor  $1 + \frac{(P-1) \cdot C_1 \cdot X_1}{C_1 \cdot X_1 + C \cdot (X_1 + X_2) + C_2 \cdot X_2}$ .

For example,  $P = 4$  under the condition  $X_2 = 10X_1$  and  $C_1 = C_2 = C/2$ , carries the relative increase of the cost for a rout user of only 10%. However,  $P = 4$  times larger tolls will meet the dissatisfaction of the other stakeholders on the transit route.

<sup>39</sup> ØresundsBron, The Øresund bridge – ØresundCommuter, <http://uk.oresundsbron.com/page/946>, downloaded 11<sup>th</sup> December 2013

<sup>40</sup> Association of European Vehicle and Driver Registration Authorities, Road Pricing in Europe, December 2010 (see page 83)

<sup>41</sup> Association of European Vehicle and Driver Registration Authorities, Road Pricing in Europe, December 2010 (see page 79, Stockholm example)

<sup>42</sup> US Department of Transportation, Federal Highway Administration, International Scan: Reducing Congestion & Funding Transportation using Road Pricing, April 2010 (see pages 2-3)

The other generally accepted way of financing the public costs of the road traffic is the excise tax on the motor fuel. The advantage of this method of money collection is a very low cost of the collection system. According to (Walker, page 17), for the collection of excise tax in the United Kingdom, only 0.2% of the collected income is used. However, the increase in the number of vehicles which do not use the petroleum products can, through time, lead to the decrease of the public income from the excise tax on the motor fuels and encourage the transition to the funding by tolling. Excise taxes on fuels (such as vignettes, which will be later discussed), can be used with more difficulty for the charging of various prices according to the place and time of the road usage. The transit vehicles usually consume proportionally less fuel in the areas of high tolls, so there is the larger burden on the local population. With the increase of the vehicle mass, the fuel consumption theoretically grows linearly, while the roadway wear and tear increases faster (see the previous section). Thus, by the fuel excise tax, the goods vehicles carry a relatively low cost of the roadway maintenance comparing to the passenger vehicles.

### **5.1.3 Vignettes**

Unlike in the Republic of Croatia, where the vehicles pay the toll at toll booths, passenger vehicles in some European countries (Slovenia, Austria, Hungary, Switzerland, etc) pay for the travelling on motorways and expressways by displaying a paper vignette on the windshield. By purchasing a vignette, the users get the right to unlimitedly use the infrastructure in a certain (often wide) space range and (often long) period. Usually, in the European practice, the usage of the state roads with a single lane in each direction and all local roads is not subject to the displaying of vignette.

The study on the introduction of vignettes for all road vehicles (Dadić and associates, 2008) is the only of that kind in Croatia available to the author. The results suggest that vignettes could ensure the toll income as with the current tolling system (Dadić and associates, page 56), but with numerous social and economic benefits. According to the suggestion, all existing bypasses around towns and major roads in the profile of motorways and expressways would be included under the scope of vignette tolling. In the public media the study was criticized by the representatives of HAC and the Ministry of Traffic, who suspect that, by vignettes usage, the toll income could plunge over 30% and that the traffic on shorter sections would probably substantially decrease.<sup>43</sup> They consider that this tolling system is not just, but that it prefers the drivers on long routes and that the frequent motorways users pay significantly less by the kilometre than the occasional users.<sup>44</sup> Considering the critics claims that the introduction of vignettes would lead to the significant decrease in the number of employees, it seems that the critics acknowledge that the vignette tolling system is highly economical.

The Table 6 shows the movements of the tolls and traffic in Slovenia (vignettes from the mid-2008). Šentvid marks the place of counting the average annual daily traffic (AADT) on the section of the local road Lukovica – Želodnik that stretches in the direction of Ljubljana, parallel with the motorway A1. A1 marks the place of the traffic counting on the motorway parallel with the counting place Šentvid. The A1 compound marks the place of traffic counting on the connection from the local road to the motorway, the

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<sup>43</sup> Index.hr, With the vignette introduction, Croatia would annually lose 800 million HRK, 25<sup>th</sup> July 2008, <http://www.index.hr/vijesti/clanak/s-uvodjenjem-vinjeta-hrvatska-bi-godisnje-izgubila-800-milijuna-kuna/396196.aspx>, downloaded on 11<sup>th</sup> December 2013

<sup>44</sup> Poslovni dnevnik, Vignettes could bring Croatia 560 million Euros, 28<sup>th</sup> July 2008

closest to the place Šentvid. The distance from Ljubljana is around 20 km.

Owing to the construction and adding of new sections to the traffic network, the traffic on the global level grows more slowly than locally. In the mid-2008, there was a transfer for passenger vehicles from the tolling of the travelled distance on the toll booths to vignettes.

Slovenia changed the tolling system for passenger vehicles from the tolling of the travelled distance to vignettes in mid-2008. During the following couple of years, the economic activity in Slovenia weakened, but the traffic of vehicles on the motorway continued to grow. The Table 5 shows that, with the introduction of vignettes, the motorway took the part of the passenger vehicles traffic from the local roads and that the local population started using the motorway almost two times more. The transfer to vignette is followed by a moderate increase in tolls and a decrease in operating costs of the motorway operator. The operating profit per a managed kilometre grew by 59% from 2007 to 2010.

However, it was not noticed that the suggestion of vignette introduction (Dadić and associates) is much different from the European practice where the vignettes are most frequently applied to light vehicles only and not for the heavy vehicles (see section 5.1.1).

**Table 6.** The prominent movements of tolls and traffic in Slovenia (vignettes from mid-2008) (Slovenian Roads Agency, Traffic load, [http://www.dc.gov.si/si/delovna\\_podrocja/promet/](http://www.dc.gov.si/si/delovna_podrocja/promet/), DARS, Business report archive, [http://www.dars.si/Dokumenti/About\\_us/Business\\_Report\\_Archive\\_277.aspx](http://www.dars.si/Dokumenti/About_us/Business_Report_Archive_277.aspx), accessed on 11<sup>th</sup> December 2013)

Year	Globally for the motorways in Slovenia						Locally on the selected place					
	Income per km x1,000 €	Overall costs per km x1,000 €	Light vehicles		Heavy vehicles		AADT passenger vehicles					
			AADT	Growth y/y	AADT	Growth y/y	Šentvid	Growth y/y	Connection A1	Growth y/y	A1	Growth y/y
2005	315	133	18,797		3,819		7,021		602		15,942	
2006	336	132	19,805	5%	4,365	14%	6,806	-3%	774	29%	18,722	17%
2007	384	146	19,307	-3%	4,412	1%	7,138	5%	853	10%	20,132	8%
2008	441	165	20,095	4%	4,799	9%	4,567	-36%	1,158	36%	28,155	40%
2009	431	144	21,018	5%	5,899	23%	4,380	-4%	1,572	36%	29,455	5%
2010	490	122	21,196	1%	6,346	8%	4,502	3%	1,587	1%	29,803	1%
2011	492	112	22,288	5%	6,258	-1%	4,561	1%	1,660	5%	30,870	4%
2012	486	112	22,251	0%	6,679	7%	4,421	-3%	1,640	-1%	30,100	-2%

#### 5.1.4 Heavy vehicles

The costs of the technologically modern tolling system of the goods vehicles traffic (GPS/GPRS or DSRC), established in order to generate profit for the maintenance of motorways in Germany and the Czech Republic, comprise 15 to 30% of the collected income. However, it is possible to get even lower costs of the tolling system: according to (Walker, p. 25), with tolling the goods and passenger vehicles traffic in

Austria, this ratio is around 11%. For the sake of comparison, this ratio in the tolling system for HAC and ARZ is around 15%. In most European countries, goods vehicles are charged only for using motorways and expressways, so the part of other users can avoid paying by using the other roads. However, heavy goods vehicles even more destroy the less hard roadway of the local road by just one travel, than the road intended for the frequent traffic of goods vehicles.

The heavy vehicles tolling in Switzerland is a unique example in European countries. This country uses border crossings to its advantage in tolling (Switzerland is not a part of the European free movement zone). Entering and exiting Switzerland, the foreign vehicles drivers give their data and the data on the vehicle. The heavy goods vehicles toll is calculated according to the travelled kilometres and the vehicle's specifications,<sup>45</sup> whereas for the heavy passenger vehicles the calculation is done according to the time of stay and the vehicle's specifications.<sup>46</sup> The local vehicles pay according to the same parameters and the control is performed on the annual vehicle examination. The system is technologically simple, robust, does not demand any large initial investments and does not create traffic jams. The share of the tolling costs in the income is just around 6%.

In the Republic of Croatia, goods vehicles and buses travelled around 2,100 million kilometres<sup>47</sup> in 2012, of which on the motorways (mostly tolled, but not completely) around 756 million km,<sup>48</sup> while there were 1,350 million kilometres outside tolling. For the sake of comparison, 10 billion HRK were spent for the construction and maintenance of public roads, apart from motorways, from 2009 to 2012, which is financed from the fuel excise fees and other fees from the vehicles' owners and the roads users.<sup>49</sup>

## **5.2 Special features of the motorways in Croatia**

### **5.2.1 The seasonality of traffic**

According to the (Croatian Chamber of Economy – Tourism sector, 2013, page 4), around 5.5 million of foreign tourist arrivals to Croatia were recorded in July and August 2012. Around 90% of tourists come to Croatia for summer holiday by roads, see (The Institute for Tourism, 2011) and (Croatian Chamber of Economy – Tourism sector, page 11), while according to (The Institute for Tourism, 2006) around 80% uses precisely the motorways. In one foreign passenger vehicle there are around 3 foreign travellers<sup>50</sup> and overall in July and August 2013, 5.5 million foreign passenger vehicles entered Croatian border crossings.<sup>51</sup> According to (The Institute for Tourism, 2006), in 2005, the visitors averagely spent on tolls around 22% of the expenditure during the driving in Croatia and the length (time) of driving in Croatia amounted to 31% (36%) of the total distance travelled. In the end, the toll paid in the Republic of Croatia was mostly about 5-10% of the total driving costs and the share in the total holiday costs is even smaller. Thus, these

<sup>45</sup> Swiss Customs Administration, Performance-related Heavy Vehicle Fee – Vehicles licensed abroad, [http://www.ezv.admin.ch/zollinfo\\_firmen/04020/04204/04208/04244/index.html?lang=en](http://www.ezv.admin.ch/zollinfo_firmen/04020/04204/04208/04244/index.html?lang=en), downloaded on 10<sup>th</sup> December 2012

<sup>46</sup> Swiss Customs Administration, Lump-sum heavy vehicle charge (PSVA) for foreign vehicles, [http://www.ezv.admin.ch/zollinfo\\_firmen/04020/04204/04208/04246/index.html?lang=en](http://www.ezv.admin.ch/zollinfo_firmen/04020/04204/04208/04246/index.html?lang=en), downloaded on 10<sup>th</sup> December 2012

<sup>47</sup> Croatian Bureau of Statistics, Transport and Communication in 2012, Zagreb, 2013 (see page 18)

<sup>48</sup> National Motorways Report for 2012, The Croatian Concessionaires Association for the Tolling Motorways, April 2013 (see page 17)

<sup>49</sup> The Government of the Republic of Croatia, The Programme for the Construction and Maintenance of Public Roads for the period 2013-2016, Narodne novine, I/2014

<sup>50</sup> The Ministry of Tourism of the Republic of Croatia, Tourism in Numbers 2012, Zagreb, 2013 (see p.43)

<sup>51</sup> Croatian Bureau of Statistics, Border Traffic in August 2013, Zagreb, 10<sup>th</sup> October 2013, [http://www.dzs.hr/Hrv\\_Eng/publication/2013/05-01-03\\_08\\_2013.htm](http://www.dzs.hr/Hrv_Eng/publication/2013/05-01-03_08_2013.htm), downloaded on 11<sup>th</sup> December 2013

travellers are relatively indifferent to the price increase.

According to (The Institute for Tourism, 2011, p. 11), two summer months, July and August, account for about 40% of the annual traffic of vehicles on the motorway A1 that leads to the seaside. Traffic jams and congestions are especially prominent at the main entrance junction to the motorway towards the seaside (Lučko) and in front of the tunnels Mala Kapela and Sveti Rok.<sup>52</sup> The jams occur at the weekend: on Friday, Saturday and Sunday, when visitors start their holiday or return home. During the busiest weekends, in one direction, around 170 to 180 thousand vehicles pass through A1 bottlenecks. During the busiest days, only in one direction on the motorway A1, there is average daily traffic of 35 to 42 thousand vehicles. According to (The Institute for Tourism, 2006), even 10% of the tourists were bothered by the waiting period for tolling, while the unpleasant experiences due to waiting in front of the mentioned tunnels have not been researched. The study (The Institute for Tourism, 2011) finds that the Republic of Croatia does not realize the significance of the traffic jams reduction in the right amount.

During large summer traffic jams, the prohibitions on the goods vehicles traffic are in effect in some periods and sections. However, in spite of the jams, the frequent motorway users have regular discounts on the regular toll price during whole summer. The monetization advisor, after examining the wishes of the interested concessionaires, recognized the potential of the income increase during summer time and proposed to the Government of the Republic of Croatia to allow the future concessionaire a clear way of price flexibility during the periods of the busiest traffic (Group of Advisors, p. 45). The visitors arriving by car are ready to pay substantially more, especially when the quality of the service is improved (e.g. less traffic jam).

### **5.2.2 The response of the Croatian concessionaires to the traffic decrease caused by the crises in 2008**

The financial crisis that started in 2008 influenced the reduction of the volume of traffic and the amount of income for the motorway concessionaires in Croatia. Between 2008 and 2012, the share of the local traffic was reduced by around 16%.<sup>53</sup> The concessionaires in the public property reacted by increasing the toll price by 15% in mid-2012, except for the users of the electronic tolling system.<sup>54</sup> In HAC, the tolling income grew by 2% in 2012, comparing with 2011, and in ARZ by 1.6%. At the same time, the number of tourist arrivals<sup>55</sup> increased by 3%, which implies that there was a further decrease in the local traffic on that part of the motorways.

In August 2012, trying to increase the income from the transit traffic, AZM increased the price on the longest route Zaprešić-Trakošćan by 15%, while the prices for all other routes (local traffic) remained the same. At the same time, they increased the discounts for the target group of local and frequent users (from 15% to 25% for light vehicles and from 10% to 13% for heavy vehicles). The rise of the local traffic in the month of price reductions was about 17% comparing to the same month of the previous year. The income increase in 2012 was about 9%. Encouraged by the described success, during the first half of 2013, AZM

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<sup>52</sup> Jutarnji list, The 9-kilometre Traffic Queue at the Entrance to the Tunnel Sveti Rok – Large Stopper on the Way to the Sea, Crowds in front of Zagreb as well, 7<sup>th</sup> September 2013

<sup>53</sup> Croatian Association of Toll Motorways Concessionaires, Bulletin 25, October 2012

<sup>54</sup> Croatian Association of Toll Motorways Concessionaires, National Report on Motorways for 2012, April 2013

<sup>55</sup> Croatian Bureau of Statistics, Statistical Information 2013, 2013 [http://www.dzs.hr/Hrv\\_Eng/StatInfo/pdf/StatInfo2013.pdf](http://www.dzs.hr/Hrv_Eng/StatInfo/pdf/StatInfo2013.pdf) (see page 72)

introduced the discount of 40% for the light vehicles that circulate on daily basis, for all sections apart from the longest Zaprešić-Trakošćan. As a result, comparing to the first three months in 2012, in the same period in 2013 the number of light vehicles on the motorway managed by AZM increased by 35% and the number of heavy vehicles by 30%, while the tolling income increased by 26%.

In the same period in the first three months in 2013, the tolling income of ATZ and HAC increased 0.5% and 9% comparing to the same period in 2012. However, the number of light vehicles decreased by -6% and -3% and the number of heavy vehicles changed by -3% and +4%. Everything stated in this section is a strong indicator that the transit traffic (long distances) can still take the toll increase to some extent, especially in the group of light vehicles. In the local traffic, the toll increase, at the current market conditions, leads to the income reduction and a significant traffic decline. The same data (the elasticity of price and demand) indicates that the toll reduction for light vehicles in the local traffic would attract more vehicles and bring higher income to concessionaires.

**Table 7.** Notable tolls in some sections in Croatia (HRK)  
(web pages of the motorways operators)

Section (company)	Distance (km)	Vehicle category			
		Group I (passenger)		Group IV (4+ axle)	
		Price	Price per km	Price	Price per km
Lučko-Dugopolje (HAC)	380	181*	0.48*	624*	1.64*
Lučko-Karlovac (ARZ)	39	18*	0.47*	77*	1.99*
Zaprešić-Trakošćan (AZM)	59	48**	0.81**	215***	3.64***

\*with electronic payment discount for the group I 33% apart from the summer season, and for the group IV 30% all year long, with additional discounts of 3% for all vehicles by EURO4, and 5% for all vehicles by EURO5 emission norm \*\* with Smart cards the discount of 25% is available\*\*\* the discount of 13% is available

### 1.3 The comparative analysis of the motorways operators in Croatia, Slovenia, Austria and Hungary

#### 1.3.1 The price levels for the motorways usage

In the annual report of ARZ for 2012, it says:<sup>56</sup> “During the determination of the toll price, the attention was paid to the optimization of the total toll income (exclusive of VAT that is paid by the motorway users), which covers the following costs: the motorway construction costs, i.e. the repayment of annuities, regular motorway maintenance costs, the costs of motorway management, the tolling costs, the costs of investment maintenance – motorway reconstruction.” Thus, motorways management in Croatia neglects the public interest (for instance, the toll price reduction).

<sup>56</sup> Motorway Rijeka-Zagreb joint stock company, The Report on the Company Status in 2012, June 2013 (see page 51)

In the compared countries, the toll for passenger vehicles is charged by vignette. Standard vignette offer is structured in three categories: 7-10 days, 1-2 months and one year (Table 3). In that way, the seasonality in the motorway usage is in the function of the cost reduction for the usage of local population. The most prominent example is Slovenia where drivers that use the motorway for travelling on holiday in the duration of seven days or longer, pay as much as around one third of the annual vignette price.

The comparison of the Tables 7 and 8 and the data on the average income per travelled kilometre from the Table 12, reveals that the toll price for passenger vehicles in Croatia is considerably higher than in the surrounding countries, for both occasional and frequent motorway users (including the discounts). The annual vignettes in the compared countries correspond to the cost of two to four return motorway trips from Split to Zagreb and the toll price of one return trip on the same route corresponds to 3-6 weekly vignettes in the compared countries. With the highest discount, passenger vehicles in Croatia pay at least 30 lipa per kilometre (1 HRK = 100 lipa). On the basis of the sources as in the Table 11, it can be calculated that passenger vehicles in Austria pay averagely 19 lipa per kilometre and in Slovenia about the half of that amount.

**Table 8.** The vignette price for the passenger vehicles in HRK (1€ = 7.5 HRK)  
(web pages of the operators)

The vignette duration	Austria	Hungary	Slovenia
7 or 10 days	62	77	113
1 or 2 months	182	122	225
1 year	605	1113	713

**Table 9.** The toll price on the section Log-Videž (Slovenia, 98.7 km) for the vehicles from the group IV in HRK (1€ = 7.5 HRK)

Electronic payment	The standard of the exhaust gas emissions	Price	Price per km
NO	All	319	3.23
YES	Euro III (2000)		
	Euro III (2000)	255	2.58
	Euro IV (2005)	201	2.04
	Euro V (2008)	176	1.78

The motorway usage for goods vehicles (vehicle groups III and IV) in Croatia is charged in the same way as for the passenger vehicles. In Slovenia, the same as in Croatia, the toll for goods vehicles is charged on the toll booths, so it depends on the travelled section (example in the Table 9). In Austria and Hungary, goods vehicles pay for the motorway usage according to the number of travelled kilometres, with the electronic system, without toll booths. The usage prices for the largest goods vehicles are listed in the Table 10.



**Table 10.** The price per kilometre for the vehicles from the group IV (large goods vehicles) in HRK (1 € = 7.5 HRK)

(web pages of the operators ASFINAG, HU-GO)

The standard of the exhaust gas emissions	Austria	Hungary	
		Motorways	Main roads
Euro IV (2005)	2.82	2.25	1.40
Euro III (2000)	3.65	2.81	1.75
Euro II (1996)		3.37	2.10
Euro I (1993)			

Comparing the Tables 7, 9 and 10, it can be seen that the cost of the usage of Croatian motorways in the public property for goods vehicles is significantly lower than in the compared countries. The disproportion between the price per kilometre for goods vehicles and passenger vehicles in Croatia is especially visible, regarding the compared countries. While in Croatia the group IV vehicles pay 4 times higher price than the group I vehicles, in Austria group IV vehicles, in average, pay at least 10 times more than the group I vehicles. Slovenia and Hungary, according to these criteria, are closer to Austria than Croatia, so it follows that this ratio in Croatia is exceptional. The consequence is that passenger vehicles provide for the most part of the motorway income in Croatia, in relation to the compared countries.

### 5.3.2 Incomes and operating costs

The costs of motorway managing, maintaining and tolling substantially differ at different operators and in different countries. Some significant business indicators are listed in the Table 8. The expected differences are:

- the toll booths system increases the costs of tolling, the number of employees in tolling and other employees and the share of salaries in the operating costs (it is the lowest in Austria where there are no toll booths, a bit higher in Slovenia where the toll booths remained for goods vehicles and considerably higher in Croatia where the toll booths are used for all vehicles),
- Lower level of salaries in the country enables lower operating costs: a large part of the operating costs comprises the salaries costs which are the lowest in Croatia, a bit higher in Slovenia and the highest in Austria; a large part of the added value of external contractors (outsourcing) comes from the same country where the motorway is, which enables lower prices of the external costs.

HAC and ARZ do not use their position to decrease the operating costs with the lower labour price (comparing to Austria and Slovenia). The reason is a large number of employees. AZM and BINA, with the same tolling system and the increased traffic comparing to HAC and ARZ, have fewer employees per kilometre of the maintained motorway and a larger part of external costs which implies the excessive number of employees at the concessionaires in the public property and the possibility of reducing costs by offering more jobs to the external service providers. It is surprising that, with the significantly higher level

of freight traffic and higher level of salaries, the operating costs in Slovenia stay at the same level or a bit below the operating costs of the concessionaires in Croatia. The ratio of the employees' number per motorway kilometre is twice larger in HAC and ARZ comparing to BINA and comparing to the same criteria in Slovenia and Austria.

BINA has a significantly higher density of the tolling points, higher traffic density, but lower ratio of employees in tolling and managed motorway length. BINA introduced completely automatised tolling on some tolling points where, during the periods of low traffic intensity (e.g. in winter, at night), tolling employees are cancelled, because of the cost reduction. At the end of 2012, the ratio of around 7 toll cashiers per tolling point was achieved, whereas, for the sake of comparison, ARZ and HAC have twice as many. With the system without the toll booth, Austria has only 0.3 tolling employees per motorway kilometre, while in Slovenia the same indicator is twice as higher. However, with the assumption of around 7 cashiers per tolling point in Slovenia, it turns out that the other half of the tolling employees are working on the jobs related to the selling and controlling of vignettes, where the expressed indicator is on the same level as in Austria.

The table 11 compares the indicators of income and operating costs in 2012. The depreciation of tangible assets would not substantially change the outcome (e.g. in ARZ it is 3% of the operating costs). The income per travelled kilometre differs from the price per managed kilometre from the Table 6, because it includes the given discounts and is exclusive of VAT. For the sake of comparison, the income per managed motorway kilometre in AZM should be corrected by the effect of refunded VAT (-20%) and then by the higher toll price comparing to HAC and ARZ (-50%). BINA and AZM are consolidated with the operator of maintenance and tolling. The question mark signifies that the data is not known. Dashes signify the ratio denominator is zero. (1€ = 7.5 HRK)

Table 11. The comparison of the indicators of income and operating costs in 2012.  
 (FINA financial reports for 2012: Bina-Istra, Egis, AZM, financial reports ASFINAG 2012 from  
<http://gb.asfinag.at/geschaeftsbericht2012/en/consolidated-balance-sheet.html>)

Indicator	HAC	ARZ	AZM	BINA	Slovenia	Austria
Tolling income per managed kilometre (million HRK)	1.48	2.64	3.80	1.30	3.64	5.59
Tolling income per travelled kilometre (HRK)	0.34	0.48	0.57	0.17	0.08	0.45
Operating costs per managed kilometre (million HRK)	0.78	1.40	0.88	0.50	0.84	3.00
Operating costs per travelled kilometre (HRK)	0.18	0.26	0.13	0.07	0.02	0.24
Average daily passage of goods vehicles	1,614	1,768	1,815	1,711	6,679	3,937
The number of employees per motorway kilometre	3.26	4.19	2.36	1.74	1.97	1.22
The number of employees per tolling point/motorway km	15.6/1.0	14.8/1.5	?	6.5/0.8	13.3/0.6	---/0.3
The number of maintenance employees per motorway km	1.7	1.9	?	0.7	1.1	0.8
The share of salaries in the operating costs	60%	49%	40%	52%	48%	17%

According to the available financial reports for 2012, the ratio of the salaries cost of other staff versus the overall salaries cost of the tolling and maintenance employees for ARZ is about 3.9 and for HAC about 0.26. For the sake of comparison, the ratio of the salaries cost in the BINA parent company and the salaries costs in the tolling and maintaining operator is 0.06, while in AZM that ratio is 0.18. Considering the fact that salaries costs of the maintenance and tolling employees are partially fixed (e.g. management, finances) it can be expected that the expressed ratio decreases with the increase of the managed motorway length. In that light, the comparison is even less favourable for ARZ and HAC. Even the union gazette<sup>57</sup> mentions that the management structure at the private concessionaires is considerably smaller. One part of the employees outside tolling and maintaining was necessary during intensive motorway construction and, by stopping public investments in this part the number of employees can be drastically reduced.<sup>58</sup>

## 6 The solution to the motorways problem in the Republic of Croatia

### 6.1 The potential of the operating profitability of ARZ and HAC

This section aims to point out that there is a significant space for better operation of the public motorway operators. The proposed measures and their financial results should be taken only as arguments indicating the profitability potential in order to support the conclusions of this paper. The financial results depend on the implementation and the author did not have the insight into the data necessary for a better estimation, so the estimated amounts are given in wide ranges. The measures are summarised in the Table 12. They do

<sup>57</sup> Independent road union – subsidiary of the Croatian motorway, Croatian news No. 125, 8<sup>th</sup> July 2013

<sup>58</sup> Independent road union – subsidiary of the Croatian motorway, Union news No. 118, 7<sup>th</sup> August 2012

not involve the motorway sections constructed after the end of 2012.

Following the comparisons from the section 5.3.2, the significant potential of the reduction of the employees' number in ARZ and HAC can be seen, above the planned restructuring programme. The author considers that the number of employees in ARZ and HAC could be considerably reduced by copying the business and organizational model of the private concessionaires in Croatia and foreign concessionaires. The estimation of the impact of some measures is summarized in the Table 12. Considering the significant part of the costs of tolling at the toll booths, there are certain potentials of the cost reduction by changing the tolling system. The references from the section 5.1.2 indicate that the electronic tolling and vignettes could provide the employees' decrease in the tolling sector, but more comprehensive analyses are necessary. Reducing the number of employees can result in the transfer of one part of the operations to the external service providers. However, the data from the Table 11 consistently indicate at the possibility of achieving the salaries share of 40-50% in the operating costs at the operators with the toll booths.

It can be assumed from the chapter 5.2.2 that the transit traffic stays at the same level in spite of the price increase, whereas the local traffic decreases. By decreasing prices from the current level, the local traffic increases and so do toll incomes. Therefore, there is a significant space for increasing the income of HAC and ARZ by the decreasing of the tolls for the local traffic. According to the currently available experiences of AZM concessionaires (see section 5.2.2), the author considers that this measure, in the winter months and excluding the busiest summer weekends, could generate 5-15% income increase. The measure is favourable from the perspective of public goods management as explained on the page 6.

**Table 12.** The potential annual EBITDA for both HAC and ARZ. The summary of the section 6.1.

<b>Item</b>	<b>The amount range from to (million HRK)</b>		<b>Clarification</b>
Current income	1,950		See section 3.2
Local traffic increase	90	270	price adjustment
Summer weekends increase	70	250	
Total income	2,110	2,470	
Salaries – tolling	- 80	- 70	7-8 cashiers per point
Salaries – motorway maintenance	- 160	- 140	1 maintenance employee per km
Salaries – the rest	- 48	- 21	shallow organizational structure
Total salaries expenditure	- 288	- 231	
Other operating costs	- 432	- 231	share of 50-60% in operating costs
Total operating costs	- 720	- 462	
EBITDA	1,390	2,008	

In the section 5.2.1 the seasonality of the traffic and the summer crowds are described, arising from the passing of 200 to 300 thousand vehicles during weekend. The charging of, in average by 50 to 120 HRK, a higher toll for the travel through the bottleneck A1, with the aim of crowd reduction during the 7 busiest weekends (see section 5.1.2), can increase the income from 70 to 250 million HRK. The author estimates that only the local traffic would be pushed out and that the part of other traffic would move to other week

days. This measure offers the possibility of trucks traffic (with a suitable fee) and means the elimination of all discounts for the travel through the motorway bottlenecks.

**6.2 The new model of the motorways management**

In the previous chapter the potential of the cost reduction and the income increase was presented, by which the EBITDA would be levelled with the cost of interest from 2012 and the sustainable business would be enabled. Thus, if the Government of the Republic of Croatia abandons the use of public companies in the solving of social issues and stimulates the optimization of the cost and revenue side of HAC and ARZ, the efficiency of the motorways operations could be significantly improved. Operating advice for rationalization and restructuring can be found at the market or they can be realized by entrusting the operating business to a private partner (managing agreement) for a short period (5-10 years). In this way, the private partner’s interest for the maximization of their benefits within the set regulations can be completely used, with considerably smaller risks due to the short contract duration. A clear and determined effort to increase operations profitability, which the public partner will benefit from as soon as upon the conclusion of the agreement and especially after the end of the first contract on maintenance and tolling management, and abandoning the motorway investments will increase the creditor’s trust and enable the refinancing of the larger part of the debt that will soon mature. HAC and ARZ can address EBRD, IFC and pension funds for one part of the debt, in order to reduce the extrusion of the central government from the credit market. Another option is securitization.

Introducing vignettes for passenger vehicles is one of the possibilities for the change of the motorway tolling system. Currently available studies and proposals, mentioned in the section 5.1.3 have some weaknesses, but taking successful solutions from other countries, the criticisms could be overcome. More thorough analyses or the implementation of a pilot project are necessary in order to, in the light of the task (1), estimate the tolling incomes and public benefits from the traffic increase, higher availability of the facilities on the motorway, etc.

As presented in the section 3.3, the state could raise one part of the necessary funds by activating the insufficiently productive public property (e.g. lottery concession, etc.). With consideration of the task (1), it could try to toll a part of the freight transport that is now not tolled by the tolling system for goods vehicles, like in Switzerland, for example. With a price of 0.4 to 2 HRK/km (depending on the vehicle weight), according to the data from the section 5.1.4, the state budget income would be from 0.5 to 2.5 billion HRK.

The options of granting motorways under concession and keeping the management over this important economic structure can be compared in billions of HRK:

- granting motorways under concession:

$$\text{monetization amount} - \text{expected risk} - \text{current indebtedness ARZ+HAC} \leq \text{monetization amount} - 34,$$

- keeping the motorways under the public management:

$$\Delta \text{ value of the better solution to the task (1)} + \text{present value of the future benefits ARZ+HAC} - \text{current value of the future subsidies ARZ+HAC} - \text{the part of the debts taken by the budget} \geq -14.$$

Regarding the monetization options, the current indebtedness is estimated in the Table 1 and the expected risk in the section 4.2 together at the amount of 34 to 76 billion HRK. Regarding the option of retaining the motorways management, in case the publicly owned motorways lose subsidies, the budget should in the following couple of years, at worst, take the half of the credit indebtedness (around 14 billion HRK), and in case of business rationalization, the value of future benefits could be much higher than the amount that in a short period moves to the public debt. The author thinks that the greatest value of the option of retaining the control over motorways is in the possibility of realization of greater public good from the motorways, i.e. finding a better solution to the task (1). However, previous inactivity and disorientation of the Government of the Republic of Croatia is a major obstacle to the realization of this management model.

The proposed management model can be generalized in four points as follows:

1. Strengthen the owner's level of competence for effectively managing the property. It has been shown that an incompetent owner cannot simply buy good advice at the market. By including other stakeholders,<sup>59</sup> the owner's incompetence for successfully controlling the advisors' work can be partially compensated.
2. The liquidity necessity should be solved by simple tools whose risks are possible to be understood and predicted and whose price can be expressed in the terms that the owner and interested parties can clearly understand at the current level of competence and knowledge.
3. The property should be valued by future benefits for a current owner. The externalities in case of the letting of the management rights should be clearly determined. The opportunity costs with the status quo should be clearly determined.
4. Public-private partnership can be a useful tool for public property management, but it is necessary for a public partner to already have a suitable level of knowledge and capabilities in order to successfully estimate and reduce the risks. When there is a suspicion of unsuitable capabilities of the public partner, shorter duration of the contractual relations should be preferred.

## 7 Conclusion

This paper has shown to which limits the classical indebtedness is a better option than the monetization by granting the motorways under concession (Table 3). The paper has achieved its aim of pointing at the value of motorways in public property, and even more at the importance of good management in the function of

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<sup>59</sup> For instance, with public property, including the public by a transparent disclosure of information can lead to the finding of mistakes in the advisors' work, which is proven by this paper.

public interest. Since the current management model has been denounced as ineffective, the new management model is suggested. The new model is basically a set of rules aiming at the change of the behaviour of the country as the owner and a deliberate effort for achieving more economical operations in the public sector.

The hypothesis of the incompetent motorway management was proven by the following arguments, according to the levels of responsibility (the number of the section which makes the assertion is written in the brackets):

- 1) The Government of the Republic of Croatia:
  - a) provides indications that it is aware of its incompetence (3.4),
  - b) insists on the investments model, without observing the justifications, contrary to the examples of good practice,
  - c) plans indebtedness by monetization in spite of already high expenses (Table 3),
  - d) does not realize the value potentials of other public property (3.3),
  - e) by reducing the share in the fuel excise fee, leads HAC into the escalation of liquidity problem (2.1),
- 2) The Ministry of Maritime Affairs, Transport and Infrastructure (MPPI):
  - a) does not recognize the shortcomings of the monetization advisor, not even the mistakes in calculation (3.1),
  - b) in spite of the experience in similar affairs, does not take into the account the monetization risks (3.2 and 4.1),
  - c) does not consider the task of public goods management, see (1) on page 94,
    - (i) sets an aim to the concessionaires to optimize the motorways income (5.3.1),
    - (ii) passenger vehicles averagely pay more for the motorway usage than in the compared countries (5.3.1),
- 3) The management and management structures within the publicly owned motorways:
  - a) the disorientation in the response to the crisis (5.2.2),
  - b) failure to achieve the set aim of optimization of incomes and expenditures (6.1),
  - c) the organization of work with redundant employees at all levels (5.3.2),
  - d) wrong arguments against the introduction of vignettes (5.1.3).

The hypothesis that the monetization has an effect according to the principle of the projection of current levels of (in)competence, which means that the offered monetization amount reflects the present competence of the public government for managing the public good, is directly proven:

- in the formula for indicative monetization amount (2), page 98, described by the monetization advisor on the basis of market research, the current levels of income and expenses are the presented variables,
- with the formula (2), current operative business is projected into future and then discounted to the present value,
- in the same way the result of the formula (2) is a projection of current income and expenses, the planned monetization can be said to project the level of competence of the public government into the future.

The final confirmation of this hypothesis will be known to the public after the announcement of the

monetization amount.

The hypothesis on the monetization as a way of keeping the level of public benefits from the motorways at the current unfavourable level (cementing) for a long period, can be observed on the basis of:

- large space for the progress in the operations of ARZ and HAC (see chapter 5 and section 6.1), that will remain unused from the perspective of public benefits and will be consumed by the private concessionaire that performs the rationalization of operations,
- indications that the current function  $D$  in (1) is far from the optimum solution to the task of public good management (2.2, 5.2, 5.3 and 6.3),
- limitations on the possibility of change of the function  $D$  in the future, that the Government of the Republic of Croatia will have to undertake if it wants to realize the indicative monetization amount given by the monetization advisor,
- natural interest of the concessionaire  $y$  to change the function  $D$  in (1) in order to maximize  $D(y)$ ,
- firm positions of concessionaires in future negotiations with the Government of the Republic of Croatia (4.1.3).

In the terms of the task given by the equation (1), the function  $D$  that the public government (on the basis of the competence level), chooses at the monetization point, remains (cemented) during the long monetization period. Due to the obligations taken by monetization, it could happen that, in case of the increase of expertise and knowledge of the public government, its actions remain specified by the framework arranged by the current incompetent public government. The effect would be that, during the agreed concession period, regardless of the competence level of the public government, public benefit stays determined by the competence level of the public government from the period of signing of the agreement. On the contrary, in case the Republic of Croatia retains the motorways management, there is a possibility that, in a reasonable period, it starts managing them in a better way, i.e. to choose the function  $D$  that solves the task (1) better.

It can be shown that the assumption that motorway investments would be abandoned for a while, which appears in this paper in several places, was actually unnecessary. That assumption does not depend on the selected option solutions. If motorways are granted under concession, and also if they are retained, the price of new investments can be observed regardless of the existing infrastructure.

The financial potentials of the change of the tolling system, especially the introduction of vignettes, should be more thoroughly examined. Furthermore, it would be worthwhile to develop a model and measure the parameters, which on the level of the Republic of Croatia would help in understanding all public consequences of the actions such as the price change, excise fee, tolling policy and the motorway availability. Without a model, it is not possible to solve the task (1) in practice.

In order to make the conclusion statistically relevant, the comparative analysis should be performed on the wider sample of motorway operators. It is interesting that, even though there are several comparative analyses of motorway operators on the level of one or two European countries, there still is not a comprehensive comparative analysis of the motorway operators on the level of whole Europe or European Union.



In scientific terms, this paper expanded the link between the symptoms of incompetence of efficient management of the public property and the inefficiency of privatization. The link was tried to be summarised by the expression “cementing and projecting of the incompetence into the future”.

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