

THE NEW TOLL ROAD FINANCING MODEL DETERMINATION

AYOMI RARASATI¹, LUKAS SIHOMBING¹, ANDREAS WIBOWO², and YUSUF LATIEF¹

¹*Dept of Civil Engineering, Universitas Indonesia, Depok, Indonesia*

²*School of Graduate Program-Civil Engineering, Parahyangan Catholic University,
Bandung, Indonesia*

There are three main problems in Indonesia toll road financing model. First, it is the lack of state budget and delayed funding distribution for land acquisition. The second problem is the lack of financial ability of the winning company which leads to financial closing failure. The third problem is related to the land acquisition process that a special purpose company has to obtain for 100% before it can propose a loan from a bank. Therefore, it is essential to develop a new financial modeling to be implemented in Indonesian toll road development. Seven financial models were identified as having been implemented successfully and effectively. These models are earmarked tax revenue, deep discount bonds, take out financing, tax increment financing, land leases, deferred debt, and private donation. However, these models have never been utilized for toll road projects in Indonesia. Therefore, this research aims to explore those seven financial models and determine the most suitable one to be implemented in Indonesia. Literature review and in-depth interview with the key stakeholders were conducted to collect the data. The results subsequently show that there are four models that have never been implemented in Indonesia. However, the combination of deep discount bond and land leases is the most suitable financing model for Indonesian toll road industry.

Keywords: Financial modeling, Deep discount bonds, Land leases, Earmarked tax revenue, Take out financing, Tax increment financing, Deferred debt, Private donation.

1 INTRODUCTION

In 2005, the Government of Indonesia, through the Toll Road Authority, published Indonesian toll road development planning for 2005-2025. It was planned that the total length of Indonesian toll road would be 6,115 km with approximately 72.3 billion USD total costs. However, according to the Indonesian Toll Road Authority in 2015, there were only 949 km of toll road operated and the increased of toll road development since 1978 was only 8.79%.

Presently, the financing model used in Indonesia is based on Law No. 2 Year 2012 on Land Acquisition for public interest development, Government Regulation No. 15 Year 2005 on Toll Road, and Government Regulation No. 43 Year 2013 on the second change of Government Regulation No. 15 Year 2005. The financing is regulated based on the appointment of a state owned enterprise to use the budgeting from central and local government for land acquisition purposes.

In order to identify the problems in the existing financial model, interviews were conducted with resource persons representing both the government and the state owned enterprises. There

are three main problems in Indonesia toll road financing model. Firstly, it is the lack of state budget and delayed funding distribution for land acquisition. The second problem is the lack of financial ability of the winning company to provide equity which leads to its financial closing failure. The government requires such company to provide a three-year financial statement, information on its involvement in other projects and its financing track record. These requisitions can make it more complicated for a company to invest in toll road. The third problem is related to the land acquisition process that a special purpose company has to obtain for 100% before it can propose a loan from a bank. In addition, the bank imposes high interest rates, short tenor and high draw down requirements.

To optimize the existing financial models, they have to be developed in a way that can accelerate Indonesian toll road development. In order to fill the funding gap, there are previous relevant studies in toll road financing models, namely earmarked tax revenue system (Favero 2006, Nambu 2006, Blackwell *et al.* 2006, Doll and van Essen 2008, Jackson 2008, Zhao and Chengxin 2011, Kunz and O'Leary 2012, Nguyen-Hoang 2014); deep discount bonds (Kistner 1991, Dailami and Hauswald 2003, Tourrucôo 2004, Lakhmani and Sikroria 2012, Ovsianynkova 2014), take out financing (Srivastava 2011, IIFCL 2014); tax increment financing (Farris and Horbas 2009, Xueming 2012), land leases (Xueming 2012, Weidong and Xiaolong 2012), deferred debt (Xueming 2012), and private donation (Xueming 2012, Tecklin and Sepulveda 2014). This research aims to explore those seven financial models and determine the most suitable model to be implemented in Indonesia.

2 LITERATURE REVIEW

Earmarked tax revenue is a financing obtained from pre-construction and construction phases by utilizing the tax revenue from vehicle and fuel taxes. The tax revenue is used to finance land acquisition, cost of finance or legal fees during the pre-construction phase (Favero 2006, Nambu 2006, Blackwell *et al.* 2006, Doll and van Essen 2008, Jackson 2008, Zhao and Chengxin 2011, Kunz and O'Leary 2012, Nguyen-Hoang 2014). Several countries have successfully implemented earmarked tax revenue model to finance their infrastructure development: United Kingdom (Wilkinson 1994), France (Favero 2006), Japan (Nambu 2006), Switzerland and German (Doll and van Essen 2008), USA (Kunz and O'Leary 2012, Jackson 2008, Ulbrich 2011, Nesbit and Kreft 2009), and China (Zhao and Chengxin 2011).

Deep discount bond is obtained from financial markets in the form of zero coupon bonds (Kistner 1991, Dailami and Hauswald 2003, Tourrucôo 2004, Lakhmani and Sikroria 2012, Ovsianynkova 2014). The use of deep discount bonds was the most innovative financing model in 1980s in USA (Varma and Chamber 1990) and it was also successfully implemented in India (Lakhmani and Sikroria 2012).

Take out financing is a financing that is taken over by a financial institution of a lender due to the long construction period (up to 10-15 years) while the lender is only able to finance up to 5 years (Srivastava 2011, IIFCL 2016).

Tax increment financing is obtained from the incremental value of the building near the toll road before the toll road is constructed and when the toll road is operated. The value is calculated from the land and property tax value and the taxable value of the building (Farris and Horbas 2009, Xueming 2012). Tax increment financing was first successfully used in California and is currently adopted in 40 states in USA (Johnson and Scott 2004, Farris and Horbas 2009).

Land lease financing model is obtained from the rental use of toll roads such as the use of toll road's land and property during the operation phase (Xueming 2012, Weidong and Xiaolong

2012). The model was successfully implemented in Beijing, China when the land leases increased by approximately 39.7% from 2003 to 2010 (Weidong and Xiaolong 2012).

Deferred debt is obtained by suspending the debt payment and the payment is paid when there is positive earning during operational phase (Xueming 2012). Private donation can be implemented when donation is granted from industrial or residential area because they gain access to the toll road (Xueming 2012, Tecklin and Sepulveda 2014).

3 METHODOLOGY

A qualitative method is used in this research to find the most suitable financial model while in-depth interviews were conducted in data collection. Additionally, this research also collect secondary data from associated documents. The aim of the interviews was to explore the contents of the study based on the historical perspective of the respondents, to explore in detail based on the reflection of the respondents' experience, and to get an understanding based on the experiences of the respondents (Seidman 2006).

Interviews were conducted to build an in-depth understanding on toll road financial models that will be used for the toll road construction in Indonesia as well as to determine the perception of the respondents based on their knowledge and experience. There are two different approaches to analyze qualitative data, namely inductive and deductive approaches. The deductive approach is conducted by coding and emphasizing on themes derived from the literature, while the inductive approach is based on the theory and more focused on what is actually found in the study (Thomas 2006).

4 RESULTS

Resource persons were experts on infrastructure financing, especially in toll road financing. They were first contacted via e-mail and instant messages (short message service) to confirm their willingness to participate in this research and their availability to be interviewed. When agreed, the interview was conducted at the location specified by the interviewee. All interviews were conducted during the period between April 29, 2015 and May 15, 2015.

Overall, there are five expert practitioners who are willing to participate in this study as respondents. There is a lack of experts in the field of road infrastructure funding, especially in the area of toll road, thus respondents were selected based on their experience and track record. In accordance to a statement letter signed by the respondents, as well as for maintaining the respondents' confidentiality, the participated respondent was given the code name R. The details of these respondents are shown in Table 1.

Table 1. Respondents' background.

No	Code	Experience (years)	Education	Sector
1	R1	15	PhD	Infrastructure financing
2	R2	20	Master	Infrastructure financing
3	R3	10	Master	Toll road investment
4	R4	8	Master	Infrastructure financing
5	R5	20	PhD Candidate	Toll road investment

Interviews with a qualitative research approach can be reported in a structure where the questions are followed by comments from the respondent, and then put in a description followed by the quote sources, or to quote and interpret the results of interviews with warm words

including the use of tables. In this study, the analysis of the interviews will be shown as long as it is considered important to select interviewees' quotes. In order to have a focus interview, any proposed financial models were discussed based on the respondents' expertise as shown in Table 2.

Table 2. Interview topic for each respondent.

Financial Model	R1	R2	R3	R4	R5
Earmarked Tax Revenue	☒	☒	☐	☒	☐
Deep Discount Bonds	☒	☒	☐	☐	☐
Take Out Financing	☒	☒	☒	☐	☐
Tax Increment Financing	☒	☒	☐	☒	☐
Land Leases	☒	☐	☒	☒	☒
Deferred Debt	☐	☐	☒	☐	☐
Private Donation	☐	☐	☒	☐	☐

The results analysis of the interviews from each model was transformed into a matrix as shown in Table 3.

Table 3. Toll road financial model in Indonesia.

	Has been implemented in Indonesia	Never been implemented in Indonesia	Existing regulations	Institutional support	Budgeting / revenue management
Earmarked Tax Revenue	☐	☒	None for toll road	None for toll road	Mixed in government budgeting
Deep Discount Bonds	☐	☒	☒	☒	☒
Take Out Financing	☒	☐	☒	☒	☒
Tax Increment Financing	☐	☒	None for toll road	None for toll road	Mixed in government budgeting
Land Leases	☐	☒	☒	None for toll road	Mixed in government budgeting
Deferred Debt	☒	☐	☒	☒	☒
Private Donation	☒	☐	☒	☒	☒

Based on Table 3, of the seven funding models proposed, three models (take out financing, deferred debt and private donation) have been applied in Indonesia while four models (earmarked tax revenue, deep discount bonds, tax increment financing, and land leases) have never been applied in Indonesia. In terms of regulations, five models (deep discount bonds, take out financing, land leases, deferred debt, and private donations) have existing regulations, while two models (earmarked tax revenue and tax increment financing) have existing regulations that exclude the toll road sector. With regards to institutional support, four models (deep discount bonds, take out financing, deferred debt, and private donations) are supported, while three models (earmarked tax revenue, tax incremental financing, and land leases) have no special institution supporting the toll road sector. Furthermore, in terms of budgeting/revenue management, four models (deep discount bonds, take out financing, deferred debt, and private donations) can be managed privately, while three models (earmarked tax revenue, tax increment financing, and land leases) are managed together within the government budgeting.

From the above analysis, four financial models (earmarked tax revenue, deep discount bonds, tax increment financing, and land leases) are potential and have never been applied for toll roads in Indonesia. In addition, two financial models (earmarked tax revenue and tax increment

financing) have no special regulations for the toll road and three financial models (earmarked tax revenue, tax increment financing, and land leases) have no special institutional support for toll roads.

5 CONCLUSION

Based on the results, to fill a funding gap for the toll roads development in Indonesia, there are four possible financial models that have not been applied in Indonesia. However, the most probable models are deep discount bonds and land leases. Both funding models were chosen because regulations exist to support the model, namely Law No. 8 Year 1995 on Capital Markets and Law No. 25 Year 2007 on Investment. Additionally, there is a financial service agency available to support these financial models. For a developing areas, land prices are still relatively low, thus the land acquisition for the toll road can be wider. Therefore, there is a potential to design a combination model between deep discount bonds and land leases for toll road financial model. This deep discount bonds can be applied as project bonds, where the bonds are issued by the Project Company to bond investors through Lead Arranger and Credit Rating Agency, and repayment will be paid during the operation phase when they receive revenue from toll road users. Meanwhile, land leases can be applied during the operation phase, where the land authority receives money from tenants. The money collected by this land authority can be used for land acquisition funding to other lands for the toll road.

Acknowledgments

The authors would like to express gratitude to Universitas Indonesia for granting a support through PITTA scheme in order to assist the researchers in completing this research.

References

- Blackwell, C., Crotts, J. C., Litvin, S. W., and Styles, A. K., Local Government Compliance with Earmarked Tax Regulation, *Public Finance Review*, 34 (2), 212-228, March, 2006.
- Dailami, M., and Hauswald, R., *The Emerging Project Bond Market: Covenant Provisions and Credit Spreads*, Policy Research Working Paper, Vol. 3095, World Bank, University of California, 2003.
- Doll, C., and van Essen, H. *Road Infrastructure Cost and Revenue In Europe*, Report to Internalisation Measures and Policies for all external cost of Transport (IMPACT), 2008.
- Farris, S., and Horbas, J., Creation vs. Capture: Evaluating the True Costs of Tax Increment Financing, *Journal of Property Tax Assessment & Administration*, 6 (4), 23, 2009.
- Favero, G., *Fiscal Decentralization and Urban Public Transport*, MIT Thesis, 2006.
- India Infrastructure Finance Company Limited (IIFCL), *Takeout Finance Scheme for Financing Viable Infrastructure Projects*, retrieved from <http://www.iifcl.org/Content/mtfc.aspx> on December 24, 2014.
- Jackson, J. J., *The Political Economics of Earmarked Taxation*, Washington University PhD Thesis, 2008.
- Johnson, T. G., and Scott, J. K., A Comprehensive Approach to The Assessment of Tax Increment Financing (TIF) Projects, *Journal of Public Budgeting, Accounting & Financial Management*; 16 (3), 395, Fall, 2004.
- Kistner, W. G., Uncertain Times Point to Zero Coupon Bonds, *Healthcare Financial Management*, 45 (4) April, 1991.
- Kunz, K. and O'Leary, S., The Importance of Federal Earmarks to State Coffers: An Examination of Distribution Trends over the Decade, *Journal of Public Budgeting, Accounting & Financial Management*, 24 (4), 578-608, 2012.
- Lakhmani P., and Sikroria, R., Infrastructure Financing Instruments with a Special Emphasis on Highways and Road, *International Journal of Management Research and Review*, 2 (9), 1668-1677, 2012.
- Nambu, T., *History of Road Development, Finance and Investment in Japan*, 2006.

- Nguyen-Hoang, P., Volatile Earmarked Revenues and State Highway Expenditures in The United States, *Transportation*, 42, 237-256, 2014.
- Nesbit, T. M., and Kreft, S. F., Federal Grants, Earmarked Revenue, and Budget Crowd-Out: State Highway Funding, *Public Budgeting & Finance*, Summer, 2009.
- Ovsiannykova, I. Project Bonds in Financing Public-Private Partnerships in Ukraine, *Visnik, KiiVs'Kogo Nacional'Nogo Universitetu Imeni Tarasa Ševčenko*, *Ekonomika*, 11 (164), 45-52, 2014.
- Seidman, I., *Interviewing as Qualitative Research: A Guide for Researchers in Education and The Social Sciences*, Third Edition, Teachers College Press, Teachers College, Columbia University, New York and London, 2006.
- Srivastava, V. Project Appraisal in Infrastructure Financing by Indian Banks, *The IUP Journal of Infrastructure*, 9 (1), 2011.
- Tecklin, D. R., and Sepulveda, C., The Diverse Properties of Private Land Conservation in Chile: Growth and Barriers to Private Protected Areas in a Market-friendly Context, *Conservation and Society*, 12 (2), 203-217, 2014.
- Thomas, D. R., A General Inductive Approach for Analyzing Qualitative Evaluation Data, *American Journal of Evaluation*, 27 (2), 237-246, 2006.
- Tourrucão, F., *Perturbation Methods in Mathematical Finance: Zero-Coupon Bonds and Equivalent Volatilities*, PhD Thesis, University of Delaware, 2004.
- Ulbrich, H. H., *Public Finance in Theory and Practice*, Second Edition, Routledge Taylor & Francis Group, London and New York, 2011.
- Varma, R. S., *Capital Structure Changes and Shareholder Wealth: The Case of Deep Discount Debt*, PhD Thesis, The Pennsylvania State University, 1987.
- Weidong, Q., and Xiaolong, L., Assessing the Performance of Chinese Land Leas Auctions: Evidence from Beijing, *The Journal of Real Estate Research*, 34 (3), 291-310, July-September, 2012.
- Wilkinson, M., Paying for Public Spending: Is There a Role for Earmarked Taxes?, *Fiscal Studies*, 14 (4), November, 1994..
- Xueming, C., Managing Transportation Financing in an Innovative Way, *Management Research and Practice*, 4 (3), 5-17, 2012.
- Zhao, Z. J., and Chengxin, C., Funding China's Urban Infrastructure: Revenue Structure and Financing Approach, *Public Finance and Management*, 11 (3), 284-305, 2011.