Toll Road Operations in Australia: A critical examination of the financial and economic realities

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1. Introduction

This paper is an analysis of the financial outcome of two BOOT (build-own-operate-transfer) toll roads, the M2 Motorway and Transurban City Link. Some of the matters raised in this paper were foreshadowed in an earlier work (Goldberg, 1998). Analysis of the M2 Motorway has been assisted by access to a financial model, hitherto confidential, from which essential information can be derived about equity returns and debt amortization. Evidence is presented that calls into question the integrity of the model and it is concluded from present value analysis that the claimed equity dividends cannot be paid nor can the debt be amortized. Various financial stratagems are being used to maintain solvency and support the share prices. The toll revenue is being augmented with interest income derived from the Infrastructure Borrowings Tax Offset Scheme (IBTOS) which will be described in detail. Long-term borrowings have increased for both projects and losses have been concealed through a trust/company arrangement. These then are the factors which drive the share price and not the traffic counts and tolls alone.

2. The M2 Base Case Financial Model

The financial model for the M2 toll road was developed by the Macquarie Bank and was included in the Equity Information Memorandum (EIM), circulated in-confidence to institutional investors prior to the public float of the M2 Motorway in December 1994. Access to the EIM was unavailable for five years when, by order of the NSW Parliament, most papers related to the M2 were released following a motion put forward by the Honourable Richard Jones in the NSW Legislative Council in October 1999. The reasons for confidentiality became apparent on detailed examination of the model as revealed in the following analysis.

3. Analysis of the Model

The essential components of the financial model are shown diagrammatically in Figure 1. The nominal financial outcome **F** over the 45 year concession period is derived as follows.

Let $\mathbf{OP_t}$ = the operating profit in year t, derived by subtracting the debt servicing costs, depreciation and other charges from the toll revenue.

$\mathbf{E_t}$ = the equity dividend in year t,

$\mathbf{D_t}$ = debt repayment in year t,

Then $\mathbf{F = \sum [OP_t - (E_t + D_t)]}$ (1).

F is the financial balance, shown in Figure 2 and is essentially an arithmetic outcome derived at a zero discount rate. This outcome should be carefully distinguished from the discounted cash flow balance derived at an appropriate discount rate from equation (2) below.

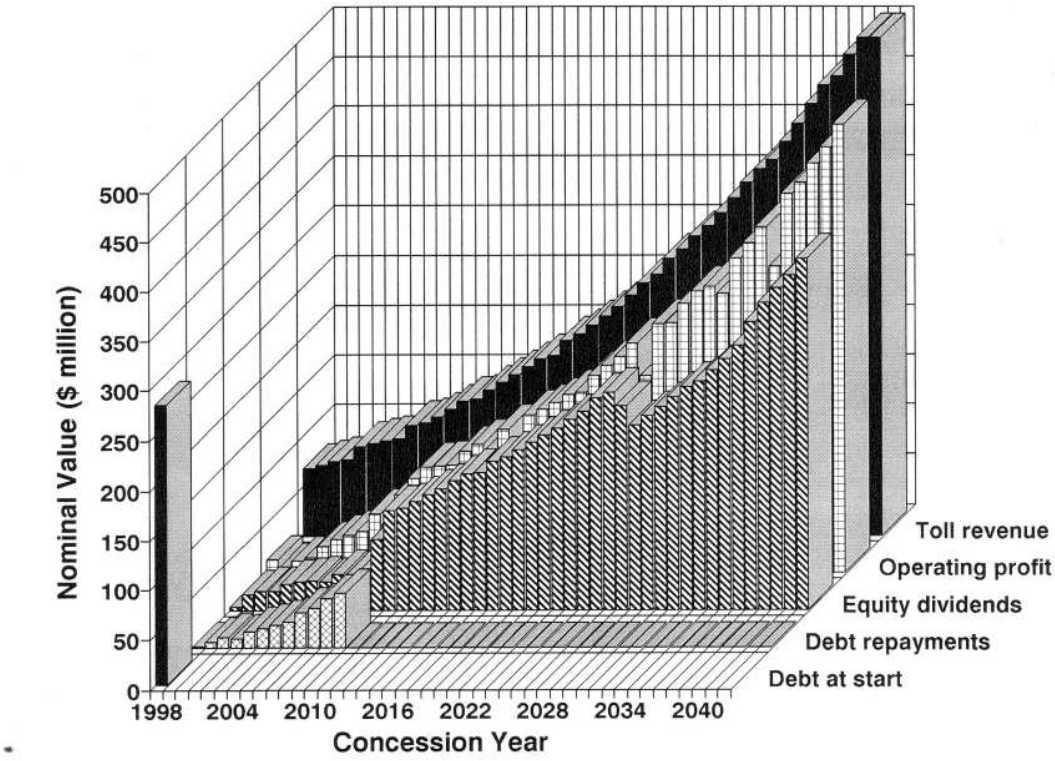

FIGURE 1. Financial quantities involved in the M2 Base Case model

4. Are the traffic forecasts properly based on principles of traffic engineering?

There are two reasons why one should suspect the integrity of the traffic forecasts The first reason relates to the magnitude of the toll revenue over the concession period. The toll revenue component extracted from Figure 1 is shown in Figure 3. It will be noticed that some quite extraordinary sums of money are predicted, particularly later in the concession period. For example in the year 2027 it would appear that the toll revenue is equal in magnitude to the entire long-term debt of the project. But such a sum of money received so far in the future does not have the same value today because of the existence of positive interest rates. One needs to discount future cash flows as explained in more detail below.

The second reason relates to the traffic conditions that prevail in the morning peak two hour period.

In Figure 4 the lane loading on the M2 is shown for different ratios of east to west traffic flow during the morning two hour peak period. If the E/W split is 60/40, as specified by Gutteridge Haskens and Davey in the M2 Prospectus, then the average lane loading is about 1850 vehicles/lane/hour, by the year 2020 .If the split is 75/25 which is generally observed on the roadway, the loading reaches 2000 vehicles/lane/hour by the year 2003. According to Austroads (1988) flow is unstable with queuing and delays. Moreover, the criteria defined by Austroads correspond to ideal freeway segments without ramps, toll gates and heavy vehicles. It is to be noted also that the tolls charged increase with the deteriorating level of service, an inversion of the backwards sloping demand curve.

It is therefore difficult to accept that a competent traffic engineer would not have taken these matters into account unless he was required to ensure a financial outcome such that very high equity dividends could be predicted to encourage investors.

The magnitude of the predicted pre-tax equity dividend yields as shown in Figure 5 is also extraordinary, reaching 100% in the year 2023. Clearly, manipulation of traffic forecasts and tolls has provided the means of deriving large equity dividends to encourage investors.

What surveillance did the Australian Securities Commission (ASC, as it was then) undertake before allowing listing of the M2 on the Australian Stock Exchange?

As noted above, the financial outcome is not real and present value analysis needs to be applied to all cash flows.

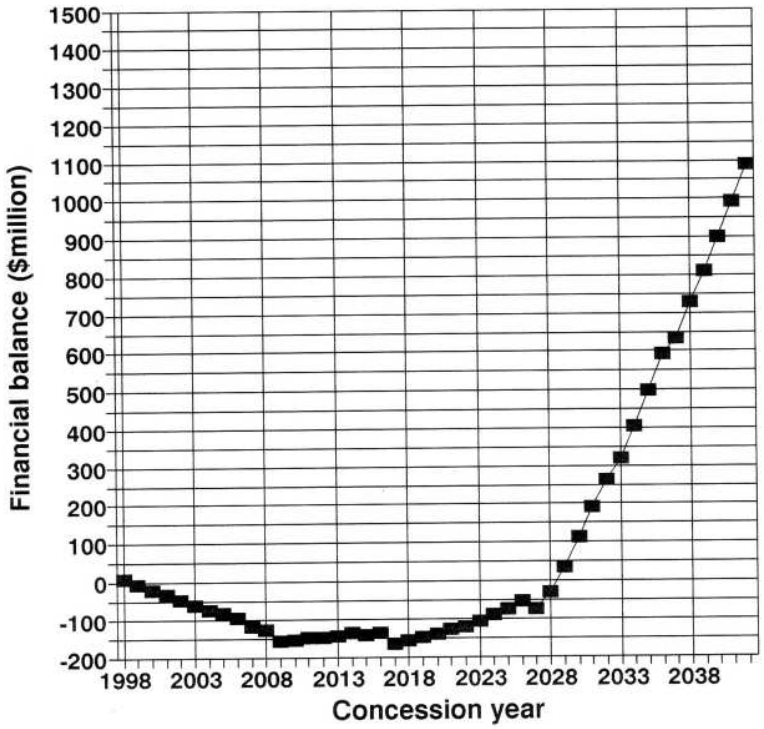

FIGURE 2. Financial balance derived from the M2 Base Case model at zero discount rate.

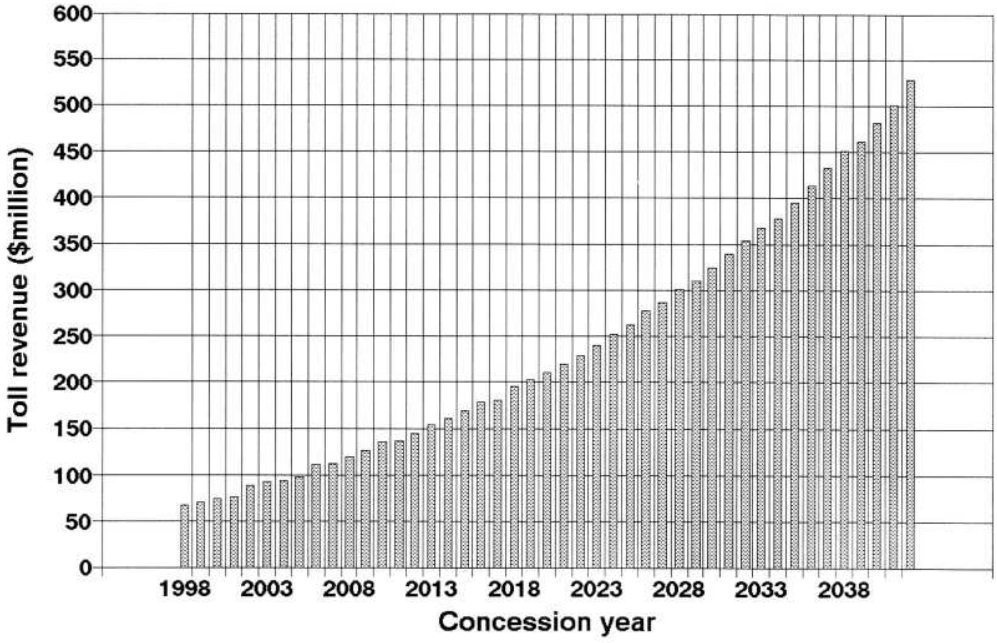

FIGURE 3. Toll revenue derived from traffic volumes and tolls throughout the concession period. The growth in revenue is exponential.

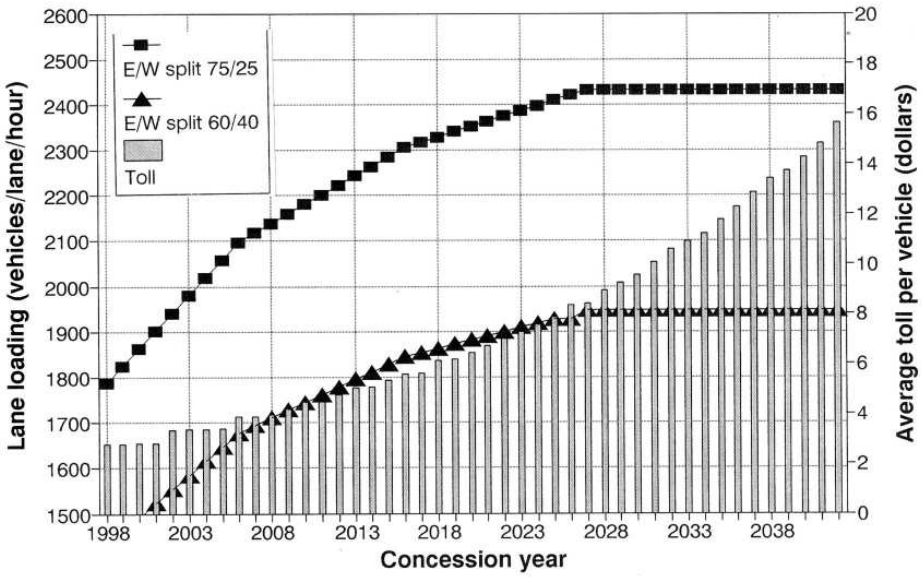

FIGURE 4. Lane loadings for different concession years and their relationship to the toll charged and the directional traffic split along the M2

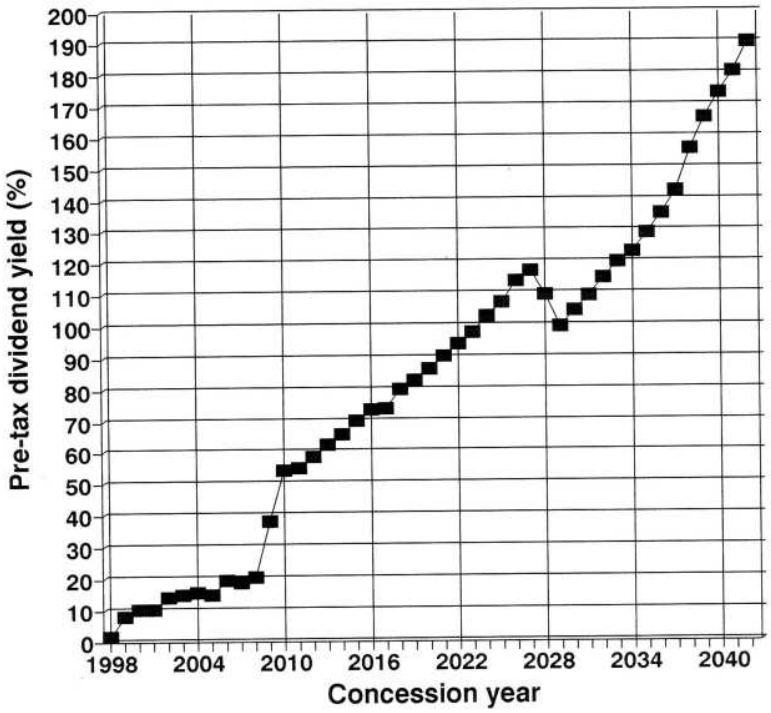

FIGURE 5. The pre-tax dividend yield (%) supposed to be paid according to the M2 Base Case model.

5. Present value analysis

Samuelson and Nordhaus (1989) have summarised the meaning of present values as follows: (page 734)

"Future payments are worth less than current payments- they are discounted relative to the present. Why are future payments discounted? Because a positive interest rate means that today's dollars will become more valuable in the future, hence future payments are worth less now, just as a distant building looks tiny".

As an example of present value analysis, which incidentally was recommended by the Private Infrastructure Task Force of EPAC, consider the debt amortisation profile. In 12 years, as shown in Figure 6, which is based on the data in the Macquarie Bank Base Case Model, the debt of $280.291 is claimed to be amortised to zero. But debt payments made in the future do not have the same value now unless the interest rate is zero. What discount rate is appropriate? The mean interest rate[1] paid on debt is 12.3% so that this is adopted as a

[1] *The model exhibits a range of interest rates. The mean value is 12.3% pa with a standard deviation of 1.6% pa*

discount rate. The resultant discounted amortisation profile shows that the debt in real terms is not being paid off at the same rate as for the zero discount case.

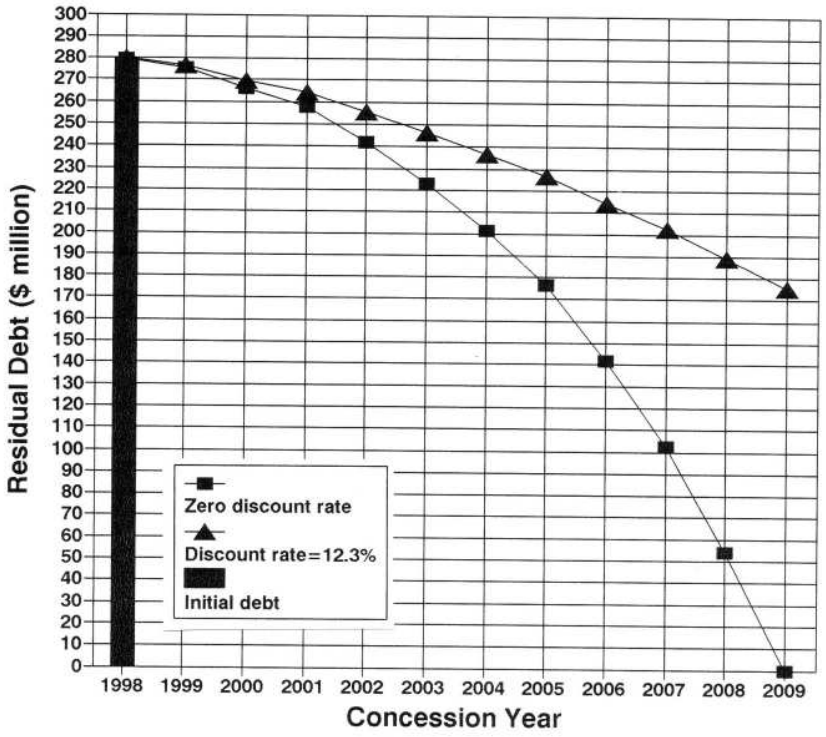

FIGURE 6. The M2 debt amortization profiles for discount rates of zero and the hurdle rate of 12.3%.pa

6. Discounted cash flow evaluation of the Base Case model.

For the model to exhibit financial viability, the cash flow should be positive when discounted at an appropriate rate. If one selects as before a rate equal to the interest rate on debt, then the discounted cash flow should for financial viability, exhibit zero or a positive outcome. The rate is commonly called the “hurdle rate”.

The formula used for calculating the discounted cash flow DCF is

$$\mathbf{DCF} = \sum [\, \mathbf{B}_t / (1+r)^t - \mathbf{C}_t / (1+r)^t \,], \qquad (2)$$

where $\mathbf{B}_t$ = the operating profit in year t,

$\mathbf{C}_t$ = debt repayment + equity payments,

and **r** is the discount rate

Figure 7 shows the result of this discounted cash flow calculation. It will be observed that for almost all of the concession period, the present value is negative and therefore the equity returns cannot be paid nor can the debt be fully amortized.

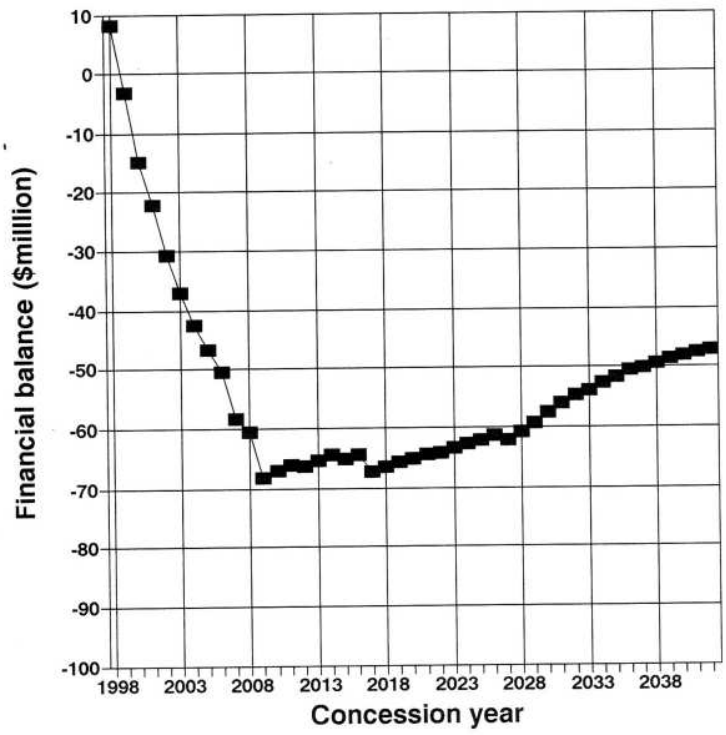

FIGURE 7. The financial balance derived from the M2 Base Case model at a discount rate of 12.3%pa

7. The need for a financial arrangement which hedges the risk of insolvency

The analysis presented so far has provided an evaluation of the extent to which this toll road meets the criteria specified by the Private Infrastructure Task Force of EPAC. This body recommended rigorous cost/benefit analysis covering both financial and the wider economic and social benefits and costs. The project satisfies neither criterion. In summary, the discounted cash flow analysis of Figure 7 shows that the use of available capital does not result in a positive present value if the claimed equity dividends are paid and the debt amortised. This result means that the capital used for the project has been misallocated [2]. It has already been shown in Figure 4 that as time progresses it becomes less likely that travel time savings will be achievable at the time of day when they are required (during the morning peak).

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[2] *In addition to this misallocation, there is an additional cost involved in setting up the financial arrangements. Of the total cost of $496m, an amount of $127m was paid out for costs not related to the construction contract (M2 Prospectus, p18). This latter amount is 82% of the initial equity subscribed of $155m. In addition, a public subsidy of $236m was received by the consortium.*

Despite the subsidies described below, the business is very likely to become insolvent unless certain measures are taken.

8. The company/trust structure of the M2 toll road

The Macquarie Bank, its legal advisors and accountants evidently believe that they have a solution to this problem by developing a dual corporate structure consisting of an operating company, The Hills Motorway Limited and a trust the Hills Motorway Trust. Each financial year there are three sets of accounts, those of the Company, the Trust and the consolidated accounts of the Group. The accounting implications of this arrangement are described below.

The Company has invested in it only 1% of the total equity and the Trust has 99% invested. However, the Trust does not operate the business which is entirely the responsibility of the Company. The Trust assumes no ongoing liability if the company fails and the liability of the Company itself is limited to 1% only. Investors in this Group are issued with $1 "stapled" securities in non-separable proportions of 1 cent in the Company and 99 cents in the Trust. This arrangement may however create unlimited liability to holders of trust units because they are in effect in a partnership. If the venture fails, the Court may find that the financial structure is a sham to create limited liability for the project.

In this case not only may the directors be held responsible for the insolvency and have "their corporate veil of protection "removed, but the Court may rule that unit holders in the Trust may also have unlimited liability.

Rogers (1993} however stated that:

"….there is no clear, definite test to which an appeal may be made, in order to determine whether the corporate veil may be set aside".

It is not unlikely that the possibility of such an indeterminate judgement may have been known to the Macquarie Bank and its legal advisors. But there is still a risk to the seven superannuation funds which originally subscribed equity to this scheme.

One finding of considerable importance is that certain costs can be concealed by this company/trust arrangement leading to the false perception that the overall financial position of the project as promoted by the consolidated accounts is better than it really is

The dual corporate structure allows the operators of the project to avoid disclosing critical financial information of interest to investors. Under accounting standards used for the disclosure of company information, a Trust is exempt from normal company disclosures.

The former NSW Auditor-General, Mr Tony Harris has drawn attention (Harris, 1998) to his view on accounting standards. He stated that:

:… accounting standards do not adequately cope with these complex infrastructure arrangements. They appear to allow preparers and auditors too much latitude to interpret the substance of a transaction".

According to Clarke et al (1997):

"Consolidated data are accountings fabrications par excellence. The aggregates for the assets, equities, revenues and expenses of the constituents are virtually certain to vary from those in the consolidated balance sheet or income statement".

Clarke et al also state that:

"It is doubtful if anybody can make financial sense of such outcomes. Certainly they defy commonsense.

Despite the financial obfuscation they facilitate, consolidated financial statements are perceived by legislative draftsmen, many legal practitioners, the courts and many accountants to be a means for lifting the corporate veil. To the contrary, they appear to achieve precisely the opposite".

Deegan (2000) remarks on the loss of information when the results of profitable subsidiaries are hidden in the aggregation process.

It is not difficult to find examples of these criticisms in the accounts of the Hills Motorway Group. We now give some examples which emphasise that quite large sums of money are involved in the understatement of losses.

The following example taken from the 1998 annual report of the Hills Motorway Group shows that the Group accounts do not aggregate the corresponding amounts in the accounts of the Trust and Company sub-entities.

Item	Hills Motorway Ltd	Hills Motorway Trust	Hills Motorway Group
Cost of plant and equipment	$ 34.937m(p47)	$11.115m (p71)	$35.779 (p20)

Consolidation appears to have reduced the combined costs of plant and equipment by an amount of $10.273m.

A second example from the 1998 annual report is as follows.

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Item	Hills Motorway Ltd	Hills Motorway Trust	Hills Motorway Group
Payments to suppliers and employees	$66.329m (p42)	Nil	$32.650m (p15)

Here we have an even greater financial imbalance between the Group consolidated amount and that of the two sub entities, where the group payments are less than those of the Company by an amount of $33.679m. No Trust amount is entered.

There is clearly an anomalous situation in the accounting consistent with the comments of the NSW Auditor-General and the two accounting authorities.

In summary, we have considered the role of the dual corporate structure in lessening the risk of corporate failure. But accounting anomalies based on this dual structure may also play a role in concealing the extent of the losses.

9. How the Infrastructure Borrowings Tax Offset Scheme (IBTOS) compensates for inadequate toll revenue

In the M2 Prospectus we read that:

"Investors returns…will be effectively dependent on the net toll revenue after allowing for all operating costs (including rent payment to the RTA)".

In the Melbourne City Link Prospectus:

"Returns to investors…will be a function of the volume of traffic using the link and the level of tolls".

But the balance sheets show a different picture. The aggregate income involves the addition to the toll revenue of an interest component, which is derived from the Infrastructure Borrowings Tax Offset Scheme (IBTOS) the origin of which is not explained by the auditors. But the existence of these additional amounts suggests that the statements in the two prospectuses are deceptive and should have attracted the attention of the regulatory authority before the M2 Motorway and City Link were listed on the ASX.

10. Details of the Infrastructure Borrowings Tax Offset Scheme (IBTOS)

IBTOS replaced the former infrastructure bonds scheme in February 1997 to eliminate tax rorts. In the new scheme lenders to transport infrastructure providers receive a tax rebate at the company rate (now 30%) on interest earned, but the providers themselves do not receive a tax deduction on that interest. The scheme is in force for 15 years under the Taxation Act, which means that the scheme terminates for City Link in 2011 and the M2 in 2009

The essential arithmetic involved is as follows.

Lenders to a project subscribe a capital sum C on which they receive an interest rate of 10%. This capital sum is invested by the borrower at a higher interest rate, say (10 + 4.45)%, generating a surplus of C x 4.45/100, which is retained by it, whereas the lender receives an interest amount of C/10.

The borrower pays tax on the cumulative amount of toll income plus the surplus described above.

The lender pays a tax offset of 30% on the interest earned. The Australian Taxation Office (ATO) controls the magnitude of the borrowings by limiting the tax offset to $75m per project per annum.

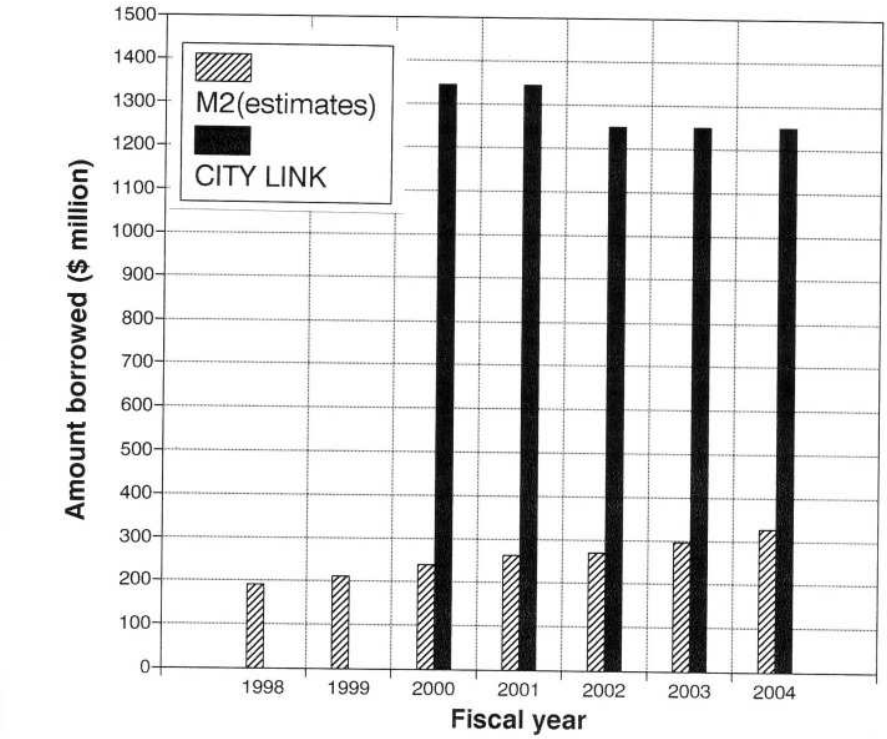

FIGURE 8. The capital amounts borrowed under the Infrastructure Borrowings Tax Offset Scheme (IBTOS) by the M2 Motorway and Transurban City Link

Figure 8 emphasises the large capital sums necessary to generate the income additional to the toll revenue. It will be observed that capital amounts about equal to the original cost of the projects are needed[3]. This absurd situation also emphasises what is at stake for the owners and operators of these toll roads who are involved in such large capital raisings to ensure solvency.

Figure 9 shows the substantial ratio of IBTOS interest to toll revenue for both the M2 Motorway and City Link. These graphs suggest that there is a stable trend in the ratio of infrastructure interest to toll revenue. Thus, the dependence on infrastructure borrowings is likely to persist into the future.

The aggregate income for the M2 over six years is $ 631.36m and that for City Link over four years is $1016m. But, of the total amount for the two roads of $1647.36m, an amount of $704.3m or nearly 43% of the total income has resulted from interest payments under the IBTOS arrangement. Exploitation of the tax system is clearly necessary to compensate for the intrinsic deficiency of revenue available from toll collections. Moreover, as shown below the system is being exploited in more than one way.

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[3]*The design and construct contract for City Link was $1148m and for the M2 Motorway $369m.*

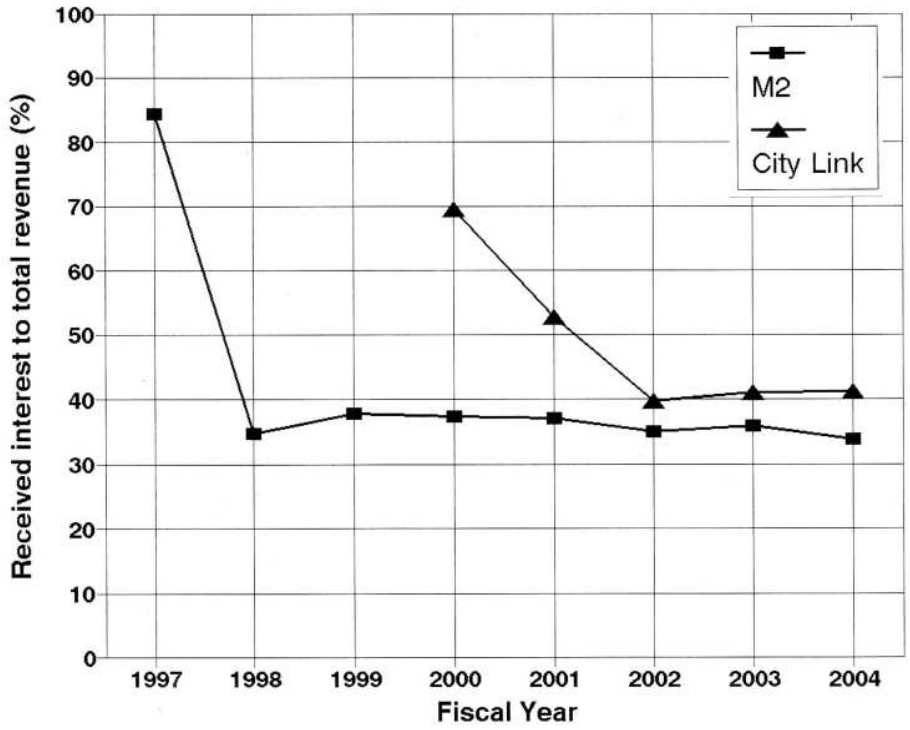

FIGURE 9. Ratio of interest derived from investment of infrastructure borrowings compared to the total revenue received by the M2 Motorway and Transurban City Link.

11. The misuse of the Infrastructure Borrowings Tax Offset Scheme to minimize operating losses

There is a serious anomaly in the accounts of Transurban for fiscal 2004. The total capital sum borrowed was $1249m and the interest received was admitted to be $180.48m (page 30). The corresponding interest rate applying to the borrowing is 14.45% per annum. The lenders are entitled to an interest rate of 10% per annum. This interest amounts to $124.9m on which the lenders pay a tax offset at the company rate of 30%, amounting to $37.47m. This is well below the allowable limit of $75m. The borrowers would therefore be entitled to receive only $55.6m which corresponds to the interest rate of 4.45% on the capital sum borrowed.

Yet, the entire amount of interest $180.48m appears *as "revenue from outside operating activities"* and is added to the project toll revenue.

Where is the amount paid to the lenders recorded? Obviously this result suggests that there is some doubt about the true financial position of Transurban. The income has been overstated by an amount (180.48 – 55.60) = $124.88m. Do such anomalies as this contribute to the extraordinarily high share price of Transurban?

12. The high level of debt and its implications.

Another feature of the financial positions of both projects is the high level of debt that needs to be amortized. Figure 10 shows these levels together with the high average level of interest rates which tend to reflect substantial risk premiums as discussed below. No significant amortisation of long term debt has yet occurred. Without interest from infrastructure borrowings, it would not be possible to properly discharge debt servicing costs nor pay dividends to equity investors.

In its 1995 report to EPAC, London Economics pointed out that the perceived risk of default is likely to be greater in the private sector than in the public sector because of the perception that government is a good credit risk. Where private capital represents pure off-balance sheet financing, it can only have the effect of substituting private obligations that are not transparent and poorly marketable for debt that is wholly transparent and wholly marketable. This substitution must increase financing costs overall. This investigation supports that view.

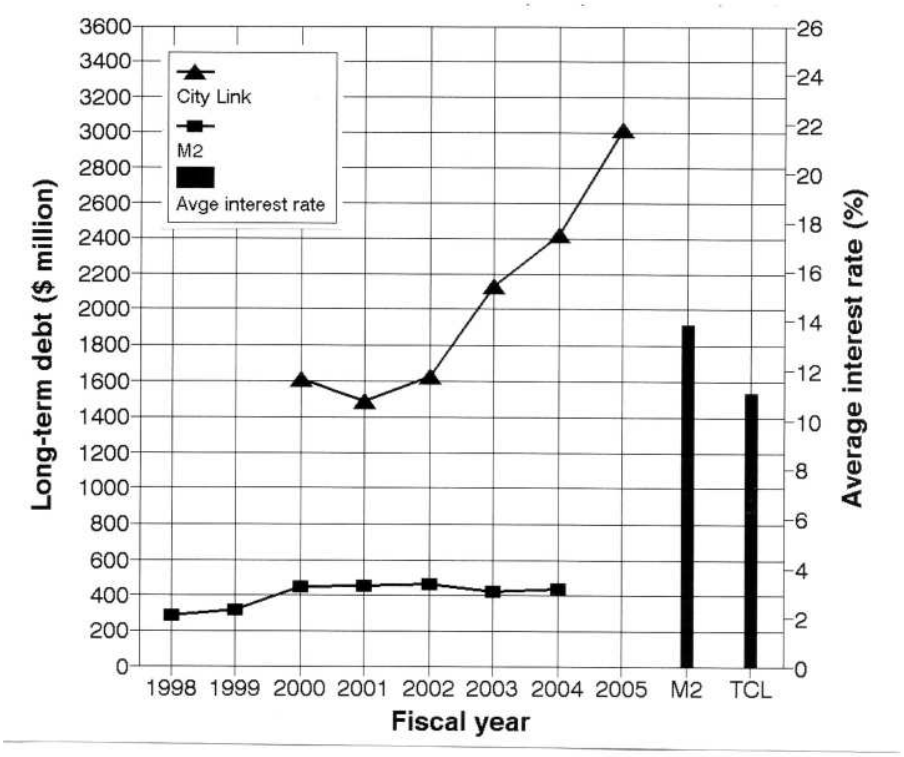

FIGURE 10. Long-term debt and average interest rates for Transurban City Link and M2 Motorway.

Figure 11 reveals in addition the very significant correlation between dividends and debt increase, and the share price and debt increase for Transurban City Link. The former correlation has a coefficient r = 0.87, and the latter a coefficient r = 0.77. Both values of r are

statistically significant at the 5% level. Clearly, debt is being used to pay dividends. This raises the question of sustainability in the long term.

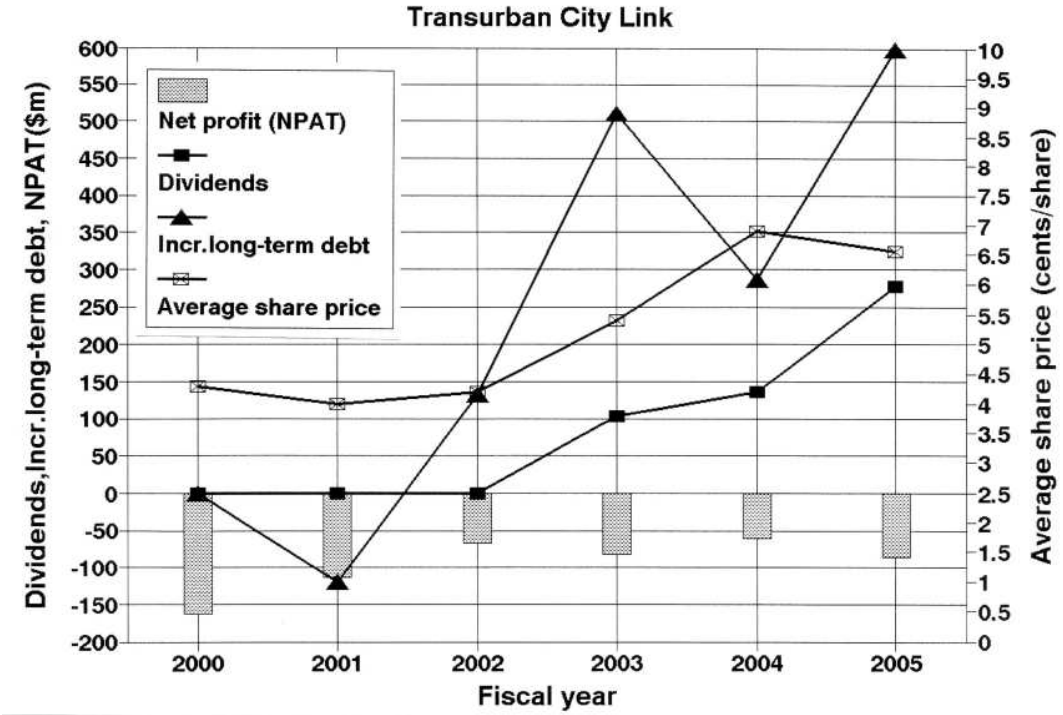

FIGURE 11. The dividends, share prices, the increase in long-term debt for Transurban City Link and the negative net profit after tax.

13. Questions for government agencies and regulators

- What information was given by the owners and operators of these roads to allow them to qualify for assistance through the tax system?
- Did the owners and operators claim commercial viability as required by the appropriate government agencies the Development Allowance Authority (DAA), the Department of Transport and Regional Services (DOTARS) and the Australian Tax Office (ATO)?
- If so,, was commercial viability dependent on the granting of taxation concessions?
- What steps were taken to check the veracity of the material provided by the applicants?
- On what basis did the ASC (Australian Securities Commission, now the ASIC) approve the prospectuses for listing on the ASX?

The Freedom of Information Act protects the owners and operators of these roads from having to answer these embarassing questions publicly. An application made by the author in 2004 to DOTARS under FOI seeking information on commercial viability was rejected. The agency appealed to the confidentiality provisions of the Income Tax Act 1936, section 16(2) which explicitly prevents an officer from making any disclosure of information in an Infrastructure Borrowings Tax Offset form.

The government agencies involved in protecting the information do not appear to consider the public interest and are therefore complicit in supporting the improper financial activities involved in these toll road schemes.

15. Concluding remarks

The financial operation of private BOOT scheme toll roads in Australia, has been shown to be critically dependent on government support through the Infrastructure Borrowings Tax Offset Scheme (IBTOS). If the IBTOS were to be terminated now, the projects would no,t on the available evidence, be sustainable.

It is not the vehicle counts and the tolls alone which drives the share price. It is the additional interest revenue from the IBTOS and the increased borrowing. The increase in market capitalization due to a rising shareprice has in turn allowed non-current assets to be revalued to levels, which are not only economically meaningless but permit more debt to be engaged through the lowering of the debt-to-asset ratio, creating a false perception of project viability. BOOT schemes clearly involve a serious misallocation of capital. These conclusions emphasize the essential weakness of BOOT schemes in Australia as revealed after seven years of operation of the M2 Motorway and five years of City Link.

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