An Analysis of the Current Investment Trend in the U.S. Toll Road Sector

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Abstract

In recent years, long term concessions through public-private partnerships (PPP's) in the US toll road sector have emerged and are expected to become a phenomenon in the near future. Up until now, only two large scale transactions, the $1.83bn Chicago Skyway and $3.85bn Indiana Toll Road (ITR) have been completed and a $12.8bn Pennsylvania Turnpike deal has just been accepted (There are numerous other much smaller existing toll road concessions in the US not covered in this paper). One interesting observation is that for the Skyway and ITR deals, the Macquarie and Cintra duo overbid the second bidder by an astonishing 161.4% and 26.2% bid spread. At the same time, the famous "Macquarie model" was recently criticized by scholars as financial engineering based and as being unsustainable (Lawrence and Stapledon, 2008).

In this thesis, the financial engineering based funds led by Macquarie have been singled out and labeled as "intra-marginal investors", whose asset investment value[1] (IV) is typically higher than the asset market value (MV) and have a tendency to overbid. Other private infrastructure funds and toll road developers have been categorized as marginal investors, whose investment value equals market value. The hypothesis is that for intra-marginal investors, the investment value of the asset is the value created through financial engineering by using the asset as the tool to speculate on. While for marginal players, the investment value is close to the fundamental value of the asset, which depends on the future income, but, investment constraints have caused the differences of investment incentives among them.

The main findings of this thesis are:

(1) Within a project consortium formed by marginal investors, private infrastructure funds and toll road developers have a short-term and long-term vision mismatch;
(2) For intra-marginal investors, the asset's "nominal" IV created through financial engineering can be significantly higher than the asset's real MV. However, these investors tend to pay IV because the financial engineering system has set up an endogenous relationship between their fee profit and the price they pay, thus creating a big bid spread.
(3) The current credit crunch has weakened the position of intra-marginal investors and will start a market correction period, leading the asset price toward MV.

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[1] Detailed definition of investment value and market value will be found in chapter 1.

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Chapter 1 Observations

Two Early Transactions

"The money is here, but where are the deals?" That is a common question I heard at last year's "investing in infrastructure (i3)" conference in Chicago.

In recent years in the United States, there are only two toll road deals that have been completed: the Chicago Skyway (Skyway) in 2004 and Indiana Toll Road (ITR) in 2005. Both concessions were awarded to foreign investors: the consortium of Macquarie from Australia and Cintra from Spain. From the bids, we can already observe the trend of high volume of dollars chasing few deals and driving prices sky high. If the US infrastructure funds follow the crowd, as McKinsey commented, they will either lose out to more audacious competitors, or they risk overpaying and achieving suboptimal returns (McKinsey Quarterly, 2008).

In a 2007 paper by Bel and Foote, a detailed study was undertaken to examine the European experience compared with the recent US experience. Table 1 lists the key financial features of the Chicago Skyway and Indiana Toll Road concessions in the US, as well as three French concessions: Autoroutes du Sud de la France (ASF), Autoroutes Paris-Rhin-Rhone (APRR) and Societe des Autoroutes du Nord et de l'Est de la France (Sanef). For the Skyway and Indiana deals, the bid spreads between the highest and second bid were big, 161.4% and 26.2%, compared to only ~2% for major European deals. The difference in regulatory bidding rules is part of the reason while this huge spread is mainly considered by the industry as a sign of market inefficiency or information asymmetry, a clear indication that the US toll road market is still at an early stage.

If we take a look at another financial indicator of the Chicago Skyway and Indiana Toll Road, the bid prices as multiple of EBITDA[2] are 63.1x and 60.2x, compared to 12.5x in the three French deals. A relatively longer concession period[3] and very aggressive growth assumptions

[2] EBITDA: Earnings Before Interest, Taxes, Depreciation and Amortization
[3] The French deals have a concession period of ~30 years, while Skyway has a 99yr lease, Indiana has a 75yr lease.

may account for part of reason. However, quoting from one of the interviewees, "30% of the bidding price is almost meaningless as there are too many uncertainties beyond year fifty"[4].

Table 1: Comparison of prices paid for toll road concessions in France and the U.S. (US$million (1))

	APRR	SANEF	ASF	Skyway	Indiana Toll Road
Year	**2005**	**2005**	**2005**	**2004**	**2005**
Gross Revenues	1,854	1,359	2,919	41	99
EBITDA	1,149	873	1,853	29	64
Concession Prices (2)	14,122	10,645	23,161	1,830	3,850
Price / EBITDA	12.3x	12.2x	12.5x	63.1x	60.2x
Winning Bidder	**Eiffage/Macquarie**	**Abertis**	**Vinci**	**Macquarie/Cintra**	**Macquarie/Cintra**
Bid spread	1.6%	1.7%	n.a.(3)	161.4%	26.2%

(1) Using an exchange rate of $1.18 to 1 Euro
(2) In the case of the French toll concessions, price includes assumed debt.
(3) There was only one bidder for the ASF concession

Source: Bel and Foote, 2007

The losing bidders have been trying to figure out why they have lost by so much. The direct consensus is that the winning bid is irrational and may fall into the "winner's curse". For the Chicago Skyway deal, the same interviewee said that the maximum rational bid should have been around $1.2bn but definitely not $1.8bn. Most of the interviewees believed that for both transactions, too much financial engineering brought in by Macquarie pushed up the bidding price, derailing from the fundamental value of underlying assets.

There are also some academic theories circulating around saying that the winning bidder just wants to establish a "first mover advantage" in the U.S. market. However, from the two deals that have been completed, it is not obvious that Macquarie and Cintra have capitalized on their advantage in terms of establishing leadership, lowering purchase price or setting up entry barriers. On the contrary, the winning consortium may well leave the opportunity for other investors to

[4] International Toll Roads Manager, a Spanish transportation infrastructure developer, Interview conducted in person on April 3rd, 2008.

enter the market and gain a second-mover advantage. On the other hand, this may be a true learning process as only one year after the Skyway deal, the ITR's bid spread was been greatly reduced.

Will a high bid price really intimidate others? Will two wins in a row discourage rivalry? Maybe. During the interviews, one losing bidder[5] thought that losing a couple of deals is just a learning process while another one indicated that they have started to focus on the East European countries where competition is relatively low.

Meanwhile Investment Controversies

It is observed that at the early stages of concession, the long-term vision of toll road developers has been weakened within the consortiums. In order to cater to the preference of investment banks sponsored infrastructure funds, the investment focus of consortiums has weighed heavily to Brownfield deals instead of Greenfield construction or Rehabilitation projects[6] (terms which will be defined and discussed later in the paper). At least currently, Wall Street seems to have less expertise and patience in investing in projects that involve complex operations, higher risk, or a long project cycle. It is predicted, however, that the Greenfield and Rehabilitation deals will represent the largest proportion of the future transportation market.

In general, as the two US cases show, toll road privatization has become a financial engineering game, which is highly preferred by some investment banks. Just as the McKinsey Quarterly pointed out, the investors have focused more on creating value through short-term speculative financial play and aggressive long-term market assumptions, instead of extracting value from improving operational efficiencies. At the project level, in order to make the numbers work, the underlying asset has to either bear very aggressive traffic demand assumptions or raise the toll prices sky high. Although the risk is higher by bearing such aggressive assumptions, the project

[5] This bidder later won the Pennsylvania Turnpike concession on May 19, 2008.
[6] Regional focused and specialty focused funds are not discussed here.

level discount rate is strangely getting lower, thus pushing up the bidding price (calculated in terms of discounted present value by using DCF[7] method).

The infrastructure fund's structure and internal operation are opaque. Take the owner of Skyway and ITR, Macquarie Infrastructure Group (MIG), for example: the investment incentive and value extraction is hiding behind a complicated accounting and auditing system. The internal asset transferring system, distribution policy and asset evaluation methods are not well informed. Its fee revenue has made Macquarie Bank the "millionaires' factory" in Australia. Two Australian scholars have found that the 'MacBank' has given out distributions through raising new capital (Lawrence and Stapledon, 2008). Jim Chanos, who earned worldwide fame for being an early critic of Enron, is shorting Macquarie's stock and refers to its business model as 'an old-fashioned Ponzi scheme' where returns are paid to earlier investors by the money from newer investors (McLean, 2007). Even Jim Cramer said that he doesn't want any association with Macquarie Bank and asked his followers to dump its stock[8].

The Credit Crunch Era

Then the big housing bubble burst in 2007 followed by the credit crunch. The credit market, once an abundant and cheap financing source, started to freeze. The leverage ratio has been pushed so low that the "traditional" leveraged buyout deals are hard to execute. With infrastructure investments, investors and the funds will mostly blame the poor performance on the equity market and the slow down of the economy. As an icon in this field, Macquarie is once again pushed to the front line as a wind vane. There is evidence showing this infrastructure giant surfs the credit storm and does business-as-usual[9]. But on the other hand, the "high cost of the debt environment will have an impact in the market place", Mr. Nicholas Moore, the new CEO of Macquarie said, "how it will flow through remains to be seen"[10].

[7] DCF: Discounted Cash Flow approach. All future cash flows are discounted to "now" with certain discount rate and get a present value.
[8] http://www.thenewspaper.com/news/20/2002.asp
[9] "Macquarie surfs the credit storm", Telegraph.co.uk, 18/11/2007
[10] "Macquarie record at risk", Chris Zappone, May 20, 2008, theage.com.au

Maybe the impact has been seen already. Just two days before Moore expressed his concern, the familiar duo of Macquarie and Cintra dropped out of bidding for the Pennsylvania Turnpike concession. The Pennsylvania deal should be considered as a good test because there are two characteristics of this project that differ significantly from the Skyway and ITR deals: (1) it is a big project with a possible bidding price of around $12~18 billion, whose risks can not be easily diversified away for any bidder; (2) the concession takes place in a credit crunching environment when speculation and leveraged buyouts are difficult to execute. Although craving for a high bid, Governor Rendell decided not to delay the deal because once delayed, it may never happen again.

A bid of $12.8bn, with a Price/EBITDA 32.5x[11] was awarded to the Abertis Group from Spain on May 19, 2008. Penn Turnpike has contrasted sharply with the ~60x multiplier of the former two deals. The spread of the top three bidders was within the 10% range[12]. Even before the bids were opened, Roy Kienitz, the deputy chief of staff to Gov. Ed Rendell, said the administration expected forthcoming proposals to be "at the lower end" of estimates ranging from $12bn to $18bn, which is far less than the $30 billion figure bandied about only a year or so ago.[13] Is this due to the pessimistic forecast of the US economy, or really a sign of market correction of the toll road privatization sector due to the credit crunch?

Research Questions

There are a number of scholars that have conducted studies from different perspectives based on these limited US and international toll road concessions. Gómez-Ibáñez et all (2004) have reviewed the regulatory and political issues; Enright (2006), Bel and Foote (2007) have conducted numerical research, focusing on the asset level revenue and trying to find the link between the high bid price and the future cash performance; Engel (2008), Samuel (2007) have addressed the issue of public vs. private financing from economic and historic aspects.

This thesis has taken on a different approach. It has focused on private investors and analyzes from the perspective of investors' market value (MV) and investment value (IV). The market

[11] Author's calculation based on the data provided by paturnpike.com
[12] http://www.landlinemag.com/todays_news/Daily/2008/May08/051208/051608-03.htm
[13] "Bonanza from lease of turnpike not so big?", 6 May 2008, Pittsburgh Post-Gazette

value is the expected price at which the asset can be sold in the current property market. The investment value of an asset is its value to a particular owner, who would be owning and operating the asset for a long period of time. So IV values may differ for different investors for the same asset at the same point in time (Geltner et all, 2007). For example, the tax advantage regarding the depreciation item or ability to increase future cash flow based on the same asset may give one investor more bidding power over another. In the real estate context, professor Geltner further indicated that the most-motivated buyer is the one who has the highest IV for the asset, but it is the IV of the second-most-motivated buyer that is often used to define (conceptually) the MV of the asset.

If we adapt this theory into the current toll road privatization market, taking Skyway for example, the Macquarie consortium is identified as the most-motivated buyer with the highest IV of at least $1.83bn. The runner up in the bidding, Abertis, is identified as the second-most-motivated buyer. Its offering price, $700m, is then conceived as the market price of Skyway, which is actually not that far from the $500m offered by the third bidder. The question is no longer if $1.83bn is the true market value of the Skyway, but why one player's investment value can be at least[14] 161.4% higher than the other one, especially given the fact that they are all sophisticated and experienced players in the field. Another following up question would be: if the bidder is conservative, then he should never pay more than MV for something; if the bidder is liberal, he should also "bargain" the price down to as low a price as possible. If the investment value of the Skyway is at least $1.83bn for Macquarie and the market value, if they can estimate, is $700m, why should he choose to pay the full IV? Isn't perhaps $800m a good enough price to offer?

One thing has to be made clear here early on is that Macquarie, Skyway, or ITR are all individual cases and the investment controversies should not be generalized with other private infrastructure funds or projects. They are widely quoted and studied because they represent the most recent large scale toll road transactions in the early stages of the US market. Macquarie Infrastructure Group (MIG), a public traded open-end fund under Macquarie, can buy and hold an asset till

[14] At this step, we cannot ascertain the bidder's IVs from their bids, because their IVs only provide an upper-bound to what they might bid.

infinity. This single point has made it very different from most of the private infrastructure funds that have a private equity fund structure with a 10 to 15 year maturity.

In this thesis, the financial engineering based funds led by Macquarie have been singled out and labeled as "intra-marginal investors[15]", whose asset investment value (IV) is typically higher than the asset market value (MV) and have a tendency to overbid. Other private infrastructure funds and toll road developers have been categorized as marginal investors (normal investors), whose investment value equals market value and thus pay market price for any asset. The author suspects that the value difference is because the intra-marginal investors are using the asset as a tool to arbitrage in the financial market while the marginal players are expecting to extract value from the asset itself.

Thesis Structure

According to the categorization above, this thesis is structured into three parts. Chapter 2 is an introduction chapter which gives background on the development of toll road infrastructure in the US, as well as identifying the market players. The thesis then breaks down into two levels, the "forest level" and the "tree level". The forest level is more generalized and addresses the issue of marginal players. The "tree level" analysis has, as mentioned before, individualizes each market player, with a focus on the financial engineering based funds.

In the forest level, Chapter 3 mainly addresses the issues regarding the marginal investors, where their investment incentives and constraints are analyzed. It is found that there is a short-term and long-term vision mismatch between the investors even under the same project consortium.

In the tree level, Chapter 4 mainly approaches the intra-marginal investors, such as Macquarie, which is criticized as financial engineering based and playing the Ponzi scheme game. The author has "guessed" how the system works and where the constraints are. Based on further calculation, it is found that overbidding actually "makes sense" for the fund and some of its

[15] Here, "investor" means the fund itself is an investor who goes out and purchases an asset. It should not be confused with the fund's security holders (also investors), who put money into the fund to manage.

speculative security holders. Chapter 5 then estimates the impact of the credit crunch on these intra-marginal investors and comes up with the conclusion that their asset investment value has been reduced, thus leading the bid price back to the asset's fundamental market value.

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Of course, the findings in each chapter do not cater exclusively to marginal or intra-marginal investors. It is just an easier way to focus on different concerns with regard to different investors. There are actually more similarities than differences.

Chapter 2 Investing in the U.S. Toll Road Sector

The Definition of Infrastructure Investment

Infrastructure investment is a hot topic today. People cannot stop talking about the infrastructure classes and assets, infrastructure funds, inflation hedging, diversification, etc. So what is infrastructure? Infrastructure means beneath (infra) the building (structure), and thus usually encompasses services or facilities that are underground, such as piped water and sewerage, or that lie on the surface, such as roads and railways. Electric power and telecommunications are often included as well, even though they are frequently provided by lines strung on poles or towers rather than in underground conduits (Gómez-Ibáñez, 2003). There are also many other ways of defining infrastructure, depending on which direction you look from.

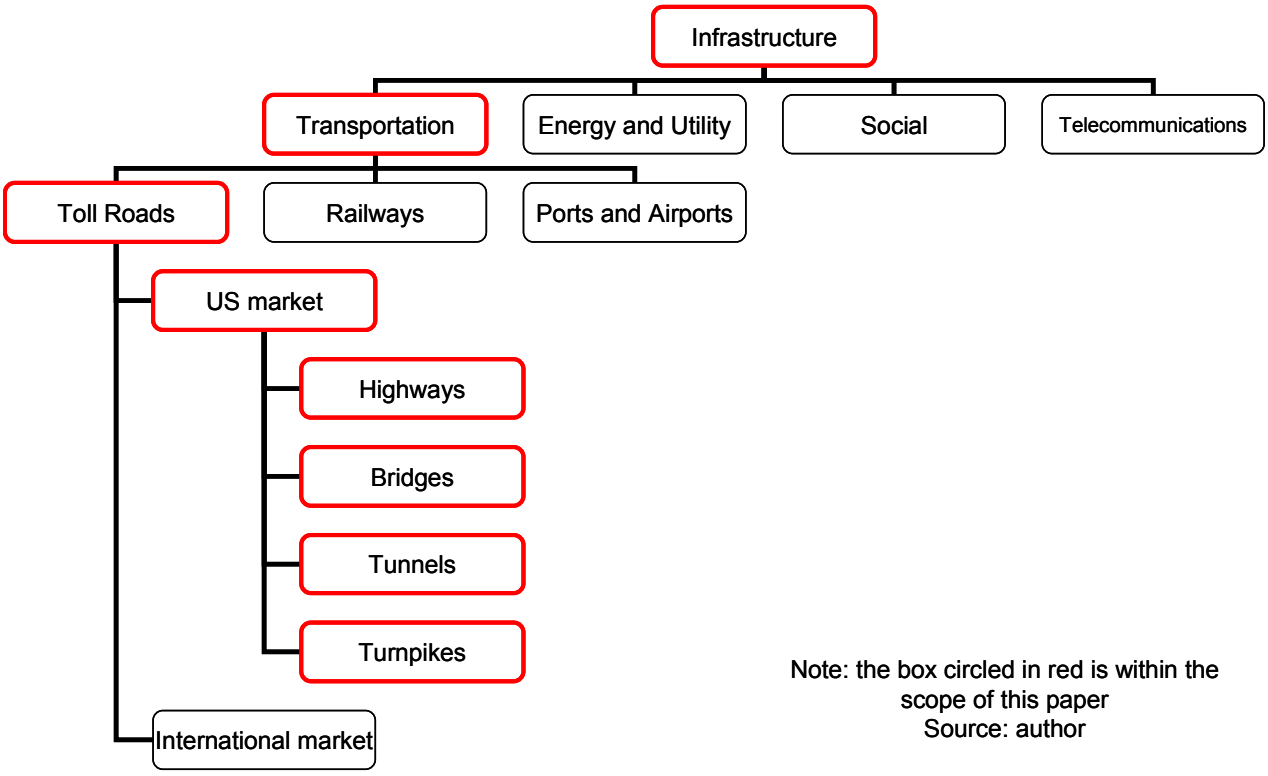
Conceptually, infrastructure relates to large scale public systems, services and facilities that are necessary for daily life and economic activity. It can be further broken down by the market types, risk-return spectrum, or most directly, the industry sectors. Most commonly, infrastructure is divided into four categories: transportation, energy and utilities, social, and telecommunications, as shown in Table 2.

Table 2: Infrastructure breakdown by sectors

Infrastructure type	Transportation	Energy and Utility	Telecommunications	Social
Categories	Roads, tunnels, turnpike, bridges	Power generation	Cable systems	Schools
	Railways	Power transmission and distribution	Signal towers	Prisons
	Ports and airports	Water treatment	Satellite	Hospitals and retirement homes

Source: author's collection based on presentations in "investing in infrastructure conference", Chicago, 2007

Figure 1: The definition of infrastructure breakdown by sectors



Note: the box circled in red is within the scope of this paper
Source: author

In the US, infrastructure is normally controlled and managed by the government. Under certain circumstances, it can become an income generating asset class through privatization. Another numerical way to categorize the infrastructure investment, as Table 3 shows, is through the risk/return spectrum, ranging from low risk projects such as government contracted social infrastructure to high risk projects such as power generation and Greenfield development.

Compared to the stock, bond and real estate markets, infrastructure investment is relatively "new"[16] in the private sector in recent decades. There is confusion among investors regarding this new asset class. According to the feedback from the 2007 investing in infrastructure (i3)

[16] From the historical perspective, infrastructure investment and privatization is actually very "old". The first great infrastructure-building wave in the U.S. was during the 19th century.

conference[17], toll road assets, like all the other real assets generating stable cash flows, have shown the investment characteristics of both real estate and fixed-income bonds. There are also investors who approach the project with speculative incentives, trying to refinance later on as well as speculate and capture the capital gains, making it more like a private equity game.

Table 3: Infrastructure breakdown by Risk/Return spectrum

Lower risk ←----------→ Higher risk				
Core	**Core +**	**Value**	**Value+**	**Opportunistic**
4-6% real return	5-7%	8-10%	11-13%	14-25%
8-10% levered return	9-11%	12-14%	15-17%	20%+
60-90% LTV	60-80%	60-80%	60-75%	60-75%
Existing bridge, Toll road, Education	Regulated assets, Parking, Health care, Storage	Rail, Airport, Energy distribution	Toll road dvlpt Telecommuni -cation Waste water	Power generation; Greenfield

Note: the return and loan-to-value (LTV) ratio refers to the standard before the credit crunch of 2007.
Source: Courtland Partners, Ltd, 2007

The potential of the infrastructure market is definitely huge. According to historical infrastructure spending rates as a percentage of gross domestic product (GDP), OECD (Organization for Economic Cooperation and Development) and non-OECD economies will require, in aggregate, $39 to $54 trillion and $71 to $100 trillion, respectively, over the next 30 years to maintain adequate levels of funding (Luchetti, 2008). At the same time, government spending on infrastructure has been steadily declining, creating opportunities for the private investors to profit from the supply-demand imbalance.

[17] This conference will be referred to 'Chicago conference' later on.

Investing Environment of the U.S. Toll Road Sector

So what is toll road privatization? Normally, it is a process in which the private investor pays the public sector a certain amount of concession fee, in exchange for a long term concession right or Greenfield development right of a toll road. During this concession period, the private sector can collect toll revenues, with an upside limit set up by the government.

The Budget Deficit of the Public Sector

The road system in the US is deteriorating and it is such a slow process that normally we don't even realize it. Combined with the inertia of human nature, people start to tolerate and get used to the deterioration of the roads and the endless congestion. Last year, the collapsed Minnesota Interstate 35W bridge really pushed the issue to the surface. The loss was not only the 13 human lives. It also reflected the constraints of the deteriorated transportation facilities resulting from economic and population growth. It is estimated that in the United States, $1.6 trillion is needed in the next 5 years to bring the infrastructure back to normal, not accounting for future population growth (ASCE[18], 2005). However, federal and state governments are facing huge budget deficits.

Why is the maintenance of road systems in the US a government responsibility? In 1956, the federal government decided to impose a federal gasoline tax to finance the construction of a 42,000-mile interstate and defense highway system, the so called "Dwight D. Eisenhower National System of Interstate and Defense Highways". Gas taxes were then chosen because some segments of the desired national network had too little traffic to be financed by tolls. The states received federal grants to build the interstate system on the condition that any new roads could not be tolled (Foote and Gómez-Ibáñez, 2007) (Some parts of the system utilized already existing toll roads).

As a result, most roads within the system have remained free. The few user fee sponsored toll roads maintain a very low toll level and revenues fall behind inflation. Even the Highway Trust

[18] American Society of Civil Engineers

Fund (HTF) created by the Highway Revenue Act of 1956, once a dependable source of financing for the interstate highway system, is facing bankruptcy. The HTF is funded through the collection of national gasoline taxes, but especially now because of soaring gasoline prices, Congress has been reluctant to raise tax for decades.

The Investment Opportunities of the Private Sector

Under such circumstances, the public sector starts to look for alternative and innovative financing strategies. One approach is to switch to the private sector through long term concessions[19], claiming that the private sector is more efficient in financing and insuring than public sector. This thinking, however, is strange for an economist "since it is hard to imagine an agent that is more able to borrow or to provide insurance than the government (with its enormous powers of taxation)" (Hart, 2003). In the same paper, Hart further explored the costs and benefits of private financing under the condition of an incomplete contract. Engel (2008) also pointed out that the distortionary cost of taxation is not a rationale for the use of private sector's funding. However, evidence suggests that the government may be reluctant in raising taxes or issuing government bonds. From the private investor's perspective, one of the justifiable reasons is that the private sector is more efficient as it can achieve very aggressive leverage from the debt market; another reason is that the private sector has been proved to be more efficient than public sector in maintaining and operating roads and other public facilities. The question of whether public or private financing is more expensive is more complex and sophisticated than what can be discussed here and definitely needs further research.

At this point, toll road privatization sounds like a win-win game until one party gets derailed. Currently, investors are given the impression that the government needs to "get the most dollars for a concession" rather than "secure the lowest bidder for providing the most efficient services as well as revenue sharing in the efficiency gains" (ULI, 2007). As a result, the government is auctioning mostly existing assets and monetizing the underlying long-term income stream in exchange for short-term cash infusion. The money can not only solve short term budget deficits,

[19] In this paper, "long term concession" and "privatization" have more or less the same meaning and are thus exchangeable.

but also offer extra discretionary revenue. The private sector, on the other hand, has to win a deal through very aggressive bidding (a lump-sum cost upfront) and thus lever up the project risk especially given the long period lease.

The Legal Framework: Public-Private Partnerships ("PPP's")

The emerging of public-private partnerships, at this stage, is very crucial as it provides a legal mechanism that enables the concession or privatization of public goods. If one needs a more authentic and rigorous definition, "Public-Private Partnerships" (PPP's)[20] refer to contractual agreements formed between a public agency and private sector entity that allow for greater private sector participation in the delivery of public projects/services. PPP's can take many forms but generally they can be defined as concessions or other types of contractual arrangements whereby the public sector agrees to give the private sector the right to inter alia operate, build, manage and/or deliver a service for the general public (Probitas Partners, 2007).

In the context of toll road privatization, at one end of the partnership is the public agency, such as department of transportation, transit authority, etc. Through PPP's, it can save the annual expenditures on maintaining roads, and at the same time get a huge lump-sum cash payment upfront from the concessionaire. At the other end of partnership is the private sector. It is usually a single entity or a consortium lead by infrastructure investment funds, toll road developers or toll operating companies. If the consortium wins the concession through a public bidding process, it has the right to increase the toll annually by a limit capped by the government and collect a long-term stable income for a concession period varying from 50 to 99 years. The consortium can sometimes choose to sell the project equity shares and "flip" the deal in the short term. There is also a possibility that the deal may turn out to be so profitable that the government will offer to buy out the remainder of the concession term at an early phase, such as SR-91 in California.

Besides all the financial flexibility described above, there are many other benefits associated with PPP's. One that gets the most attention is that the new concessionaire has been very quick

[20] Source: U.S. Department of Transportation, United Nations Economic Commission for Europe.

to make changes to boost efficiency. Just as the New York Times described for the concession of the Indiana Toll Road:

"(The concessionaire) bought coin and bill counting machines so that toll collectors no longer had to spend 45 minutes a day stuffing hundreds of dollars in nickels, dimes and quarters into rolls. Freed from rigid government contracts, the consortium has negotiated lower prices for new snowplows and roadway de-icing liquid. In addition, there is a new incentive program in place that rewards employees with an extra month's pay for good customer relations, attendance and initiative. And televisions have been removed from the tollbooths to force collectors to focus on their jobs."[21]

Another advantage that prevails among academics but is beyond the scope of this paper is that through PPP's, developing countries can bring in advanced technology from developed countries and naturally inherit the knowledge after the concession term, the so called "technology migration".

The biggest challenge of the PPP's, based on the industry's feedback, is inappropriate risk sharing. The public sector tends to lay off all of the responsibilities to private investors, which makes the latter very difficult even to get the project get insured (Probitas Partners, 2007). Another challenge is the so called "incomplete contract" given the very long term concession period (50-99yr) and the reduced commitment from both the private and the public sector as the project goes along[22]. There are also many risks that get defined within the context of PPP's, such as demand risks, regulatory risks, technology risks, political risks, currency risks, leverage risks, sponsor risks and headline risks, etc.

According to the definition of Federal Highway Administration (FHWA), in recent years, PPP's can be applied to a relatively larger range of transportation functions across all modes, including project conceptualization and origination, design, financial planning, construction, operation and maintenance, toll collection and management. Typical procurement and contract methods include design-build, build-operate-transfer (BOT), design-build-finance-operate-transfer (DBFOT) and build-own-operate (BOO).

[21] New York Times, "Toll Road Offers New Jersey a Fiscal Test Drive", April 13, 2008,
[22] Professor Oliver Hart, Department of Economics, Harvard University, interview conducted in person on Mar 18, 2008; Frederick Salvucci, Senior Lecture, Massachusetts Institute of Technology, interview conducted in person on Mar 11, 2008.

Cherry-Picking the Deals

In the toll road sector, a common complaint is that there are not too many good deals. In the U.S., there are not many major roads that can be privatized because most of them belong to the interstate highway system and may not be tolled. It is almost impossible for the government to start tolling these roads, much less consider long term concessions to private investors.

Pennsylvania Governor Rendell faced enormous opposition when he filed an application with the Federal Highway Administration (FHWA) seeking permission to toll Interstate 80, part of the interstate highway system. The opposition, on the other hand, gave the governor every reason to pursue the privatization of Penn Turnpike. As part of the roughly 3,000 miles of toll roads built before 1956, the Penn Turnpike is grandfathered into the interstate route network and could continue to charge tolls. Although such grandfathered toll roads are rare, the Penn Turnpike is definitely not the first one to get privatized. Governor Daniels from Indiana pocketed $3.85bn from the 99-year concession of an Indiana toll road in 2005. The cherries are not only limited to the toll turnpikes. After the city of Chicago leased out the Chicago Skyway for 99 yrs in 2004, it further signed a 99 yr lease with Morgan Stanley for the underground parking system near the Millennium Park. The Chicago Transit Authority (CTA) is currently seriously considering the privatization of Midway airport as well as all the public parking meters in downtown.

On one hand, the government has the incentive to cherry-pick the best assets possible to privatize, as it wants to cash in on as much money possible upfront, especially within one political term. On the other hand, the private investors also want to invest in the best deals to generate long term stable income, either for holding or for speculating.

Not discussed as part of this paper is a third alternative for the ownership and management of public facilities. There are a number of semi-public but independent non-profit “authorities” which were created by state and local governments to float bonds to own, construct and operate roads, bridges, airports, etc. They are usually managed by a Board, the members of which are chosen by the affected jurisdictions and which operate pursuant to a charter. Examples are the New York Port Authority which manages New York City bridges and other facilities, the New

Jersey Turnpike Authority and the Massachusetts Turnpike Authority. It is doubtful that these authorities would be vulnerable to a for-profit privatization since they generally have reputations for relatively reasonable tolls and good maintenance. Also, since most of these authorities involve multiple jurisdictions, securing any kind of consensus about privatization would be next to impossible.

Active Market Players in the Toll Roads Investment

A market can not be called a market if no one is trading. The first modern privatization of toll roads was in Spain in the 60's and the massive wave of the international practice of toll road privatization started in the early 90's, lead by the United Kingdom (UK), Australia, Canada, and Continental Europe. There are, on the other hand, relatively few transactions that have occurred in the US. That is why in this industry, the US is ironically being called an "emerging market". It is not hard to notice that there are mainly two types of players from the private sector: I call one "Financial Players" and the other "Operational Players".

Table 4: Active market players in the toll roads privatization

Active Market Players	
Financial Players	**Operational Players**
Funds sponsored by Investment Banks	Toll road Construction Companies
Funds raised by Private Equity*	Toll road Operating Companies
Funds backed by Pension Funds*	Toll road Developer (construction + operating)

* There are actually very few independent infrastructure funds that are only sponsored by private equity or pension funds.
Source: author, based on interviewees' feedback

The Operational Players

In the toll road sector, the operational players are almost all foreign companies from Europe and Australia. In the early years, before transportation infrastructure became an investment asset class, they were almost the sole players in the market. A typical operational player can be large

toll road developers such as Cintra from Spain, Vinci from France, who can do engineering, construction, operating, and service all in-house; it can also be small to medium toll road operators, such as Brisa from Portugal, Transurban from Australia, who focus only on toll road operation and efficiency improvement. The key differences are that a toll road operator focuses on management and has to contract out construction work, while a toll road developer typically does the construction work itself and thus is very capital intensive.

The operational players are traditionally positioned to be long-term players. Well, longer term than the financial players. After all, it is their core business to construct and operate the toll road facilities. The major private operational players are listed in Table 5.

Table 5: Major operational players in the international transportation market

Company Name	**Country of Origin**	**Company Profile**
Abertis	Spain	Transportation and communications infrastructure construction and management
ACS Dragados	Spain	Construction and Services
Autostrade per I'Italia	Italy	Leading European Concessionaire for toll motorway construction and management, and for related transportation services
Brisa	Portugal	Largest Portuguese motorway operator
Cintra	Spain	One of the leading private developers of transportation infrastructure in the world
FOMENTO DE CONSTRUCCIONES Y CONTRATAS, S.A. (FCC)	Spain	Spain's leading construction and service groups
Hochitief	Germany	HOCHTIEF is an international provider of construction services with a focus on concessions through PPP
Itinere Infraestructuras[1]	Spain	Construction and Engineering

Laing/Equion	UK	Specialist owner, operator and manager of public sector infrastructure assets in the UK and internationally.
Sacyr/Vallehermoso	Spain	Engages in the construction, real estate, contracting, property-owning and services businesses.
TransUrban	Australia	Leading international toll road developer and investor with major assets in Australia and emerging interests in the US and UK.
VINCI	France	Europe's leading operator of transportation infrastructure concessions

1. Itinere used to be a subsidiary of Sacyr Vallehermoso Group. As of January 7, 2008, Itinere Infraestructuras S.A. was acquired by Europistas Concesionaria Espanola SA.
Source: author; company profile derived from each company's website

Besides maintaining a good business performance, as a long-term player, the operational player places more emphasis on the quality of service and maintenance, technology innovation, social and environmental responsibility. For example, one of the French Company Vinci's subsidiaries - Cofiroute - has set up sustainable development indicators and hires about 30 employees to collect, process and consolidate the measurement data. On the finance side, the operational players can always issue corporate debt or obtain long-term loans from banks to finance the construction work, reflecting a confidence in their companies' growth. The new borrowings are normally at fixed interest rate, reducing the potential delinquency risk.

Operational Players' Investment Constraints

A Saturated Local Market:

After interviewing several toll-operating and construction companies in Europe, there is a consensus that the domestic markets where they are located are becoming saturated, such as Spain where Abertis and Cintra are located, or Portugal where Brisa situates. If we take a look at the comparison of roadway networks between the European countries and the US, we may not

wonder why the foreign investors are so craving about the US toll road market. If the US can further privatize its roads or privatize even a small portion of the interstate system, it can create a gigantic market.

Table 6: Toll facilities in the United States (miles)

	Toll Road Mileage		Toll Bridges & Tunnels	
Year	Interstate	Non-Interstate	Interstate	Non-Interstate
1997	2771.60	1599.30	111.44	197.44
1999	2770.40	1643.34	106.54	196.07
2001	2817.30	1784.56	105.14	213.28
2003	2814.30	1907.53	108.14	217.89
2005	2795.30	1834.62	106.24	217.37
2007	2908.46	1939.07	106.24	182.61

Source: Federal Highway Administration, USDOT

Table 7: Motorway network and toll motorways in EU and US in 2004 (miles)

	Roadway Network	**Toll Roadways**	**%**
Spain	6,524	1,622	25%
Portugal	1,411	1,100	78%
France	6,452	4,872	76%
Italy	4,250	3,476	82%
Europe	**34,706**	**11,830**	**34%**
US	**>46,837** [(1)]	**5,135** [(2)]	**11%**

Note: (1) the total miles of the interstate system; a lot of limited access superhighways (both toll and freeway) that are not part of the interstate highway system are not included. (2) the total mileage of toll facilities in 2007
Source: Bel and Foote, 2007; authors calculation based on data from USDOT

From the interviews, some of the European investors seem very optimistic about a further opening of the US market; some of them even believe that there may eventually be a change in attitude among the US road users (frustrated by deterioration and poor maintenance) who would be willing to pay tolls even for the interstate highway system. On the other hand, they also realize the regulatory and political differences between U.S. and Europe, which may slow down the deepening of the market. Other than exploring the U.S. market, these European investors

have already invested in large numbers of projects in their ex-colonial countries. One of the interviewees said that these countries are chosen simply based on historical and culture reasons[23].

Table 8: Operational investors' investment outside UK, Continental Europe and US

Company Name	Albertis	Brisa	Vinci (Eurovia)	Cintra
Country Origin	Spain	Portugal	France	Spain
Targeting markets outside UK, continental Europe and US	Mexico, Puerto Rico, Colombia, Bolivia, Chile, Argentina, South Africa	Brazil	Canada (Quebec), Chile	Chile, Puerto Rico, Canada

Source: author; the company's website

Diversification:

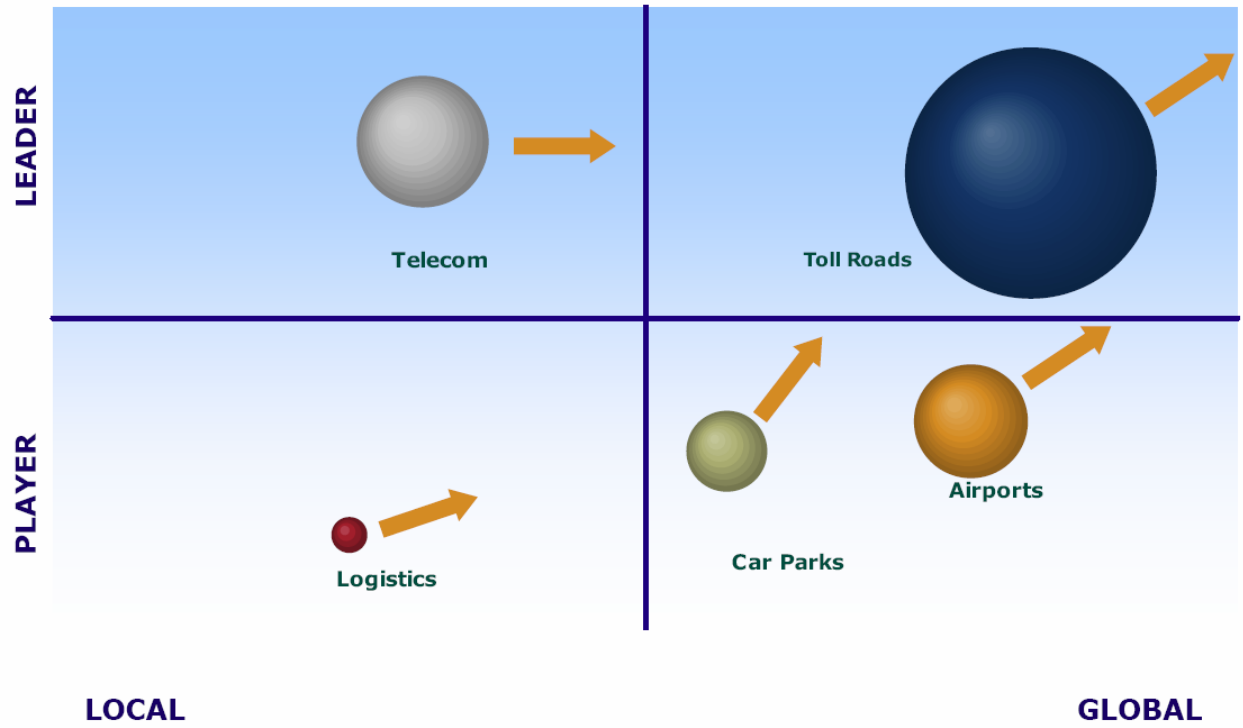
Different from investment funds, the investments of operational players are more focused and can not achieve risk diversification through financial playing. After heavily investing in the domestic market as mentioned above, there needs to be either (1) geographical diversification, or (2) asset diversification. Monetizing existing toll roads does not present large opportunities because the core assets are limited as well as there is intense political opposition.

One interviewee[24] mentioned that toll roads represent a concept of mobility: transferring an object from one place to another place. Investors can replicate the same investment concept and target other assets such as telecommunication and logistics infrastructure. An even better analogy would be power transmission where both the supply and demand risks have been eliminated. Take Abertis, one of the largest transportation developers in Europe, for example. Their strategy has been gradually moving from local to global. New assets investment such as telecommunication will play a major role in the future.

[23] Deputy Director, International Development, Brisa Auto-Estradas de Portugal, interview conducted in person, April 7, 2008

[24] International Toll Roads Manager, Abertis Infraestructuras S.A, Interview conducted in person on April 3rd, 2008.

Figure 2: Abertis Infraestructuras S.A - investment strategy and positioning



Source: Abertis' Presentation to Investors, 2007 March-April

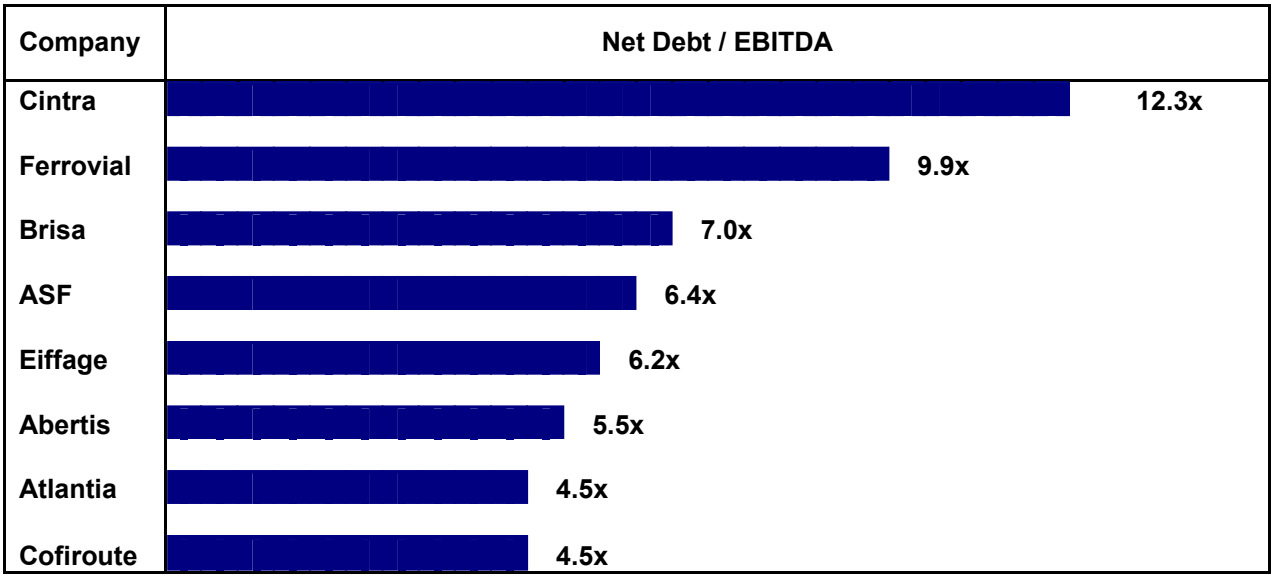
Expansion and Growth:

All of the operational players have gone through an Initial Public Offering (IPO). Any company craves for expansion because it is the only way to increase the share value of its stock to satisfy its shareholders. Debt ratios provide information about protection of creditors from insolvency and the ability of firms to obtain additional financing for potentially attractive investment opportunities (Ross-Westerfield-Jaffe, 2005). Given the low debt ratio listed in Table 9, it is believed that each company has enough room to be further levered up (taking on more debt).

It is also worth noting that the debt data derived from the corporate balance sheets is only the unpaid balance; the current level of interest rate and risk is not reflected. Also, some of the acquired toll road assets are under the name of the project company. For example, the Chicago Skyway project is held by the Chicago Skyway Concession LLC, a subsidiary of Macquarie and

Cintra. It is not definite that the debt incurred at the asset level will show up on their own balance sheet.

Table 9: Net Debt / EBITDA of selected operation players



Source: author based on data provided by the Abertis Annual Shareholder Meeting 2008

The Financial Players

If there were only operational players in the market, toll road investing might not have become a phenomenon, or at least not happening this quickly. The toll road investment business was out of the scope of financial market until Macquarie, the Australian based infrastructure investment group[25], realized that simple infrastructure assets, applied with some financial engineering knowledge, can create extra value. They started to raise various infrastructure funds back in the 90's and this infrastructure giant has provided investors with an average annual compound return of 19.4% over an 11 year period[26]. Quoting Fortune Magazine, "Macquarie Bank has made infrastructure funds a smoking-hot investment class" and the "Macquarie model", as both believers and skeptics call it, is now spreading around the world[27].

[25] It is now Macquarie Bank.
[26] Source: media session, http://www.macquarie.com.au/au/about_macquarie/media_centre/20060303a.htm
[27] "Would you buy a bridge from this man?" by Bethany McLean, Fortune editor-at-large

From then on, infrastructure investment, famous for stable cashflow and inflation hedging, became a very attractive and independent asset class and lead to a "mushroom growth" of infrastructure funds. From 2006 to mid-2007, it is estimated that private investment funds raised $105bn for infrastructure projects worldwide (McKinsey Quarterly, 2008).

Table 10: Active Infrastructure Funds[1] in the US[2] Infrastructure Market

Company Name	Country of Origin	Fund Size (MM$)	Year Founded	Fund Sponsor
Alinda Capital Partners I	USA	3,000	2005	Private Equity
Alterna Core Capital Asset Fund	USA	1,000	2007	Equity Fund
Babcock & Brown Infrastructure Fund North America	Australia	2,000	2006	Equity Fund / Investment Bank
Borealis Infrastructure	Canada	N/A	N/A	Pension Fund
Carlyle Infrastructure Fund	USA	1,000	2005	Private Equity
Citigroup Infrastructure Investors	USA	3,000	2007	Investment Bank
GS Infrastructure Partners I	USA	6,500	2006	Investment Bank
Macquarie Infrastructure Partners	**Australia**	**4,000**	**2000***	**Investment Bank**
Merrill Lynch Infrastructure Fund	USA	2,000	2007	Investment Bank
Morgan Stanley	USA	3,000	2006	Investment Bank
JP Morgan Infrastructure Fund	USA	Open Fund	2007	Investment Bank
RREEF North American Infrastructure Fund	USA	500	N/A[3]	Private Equity

1. Funds that focused uniquely on Energy and Utility investment are excluded
2. Funds that exclude the US as investment market are excluded
3. N/A: not available

* Macquarie is highlighted as an early player in this market.

Source: author's selection based on the data provided by Probitas Partners, August 2007

These financial players, as the name suggests, are in charge of the financing job. For example, they can help to achieve "better" debt structure with a higher leverage ratio, lower interest rates, insurance and higher bond ratings, etc. A typical financial player will be the infrastructure funds sponsored by specialized investment groups such as Macquarie, Babcock & Brown, or various Wall Street investment banks.

It is important to point out that although Macquarie has become a brand name in this field, most of the infrastructure funds are not publicly listed open-end funds but privately raised closed-end funds. Their 10 to 15 year maturity often encounters problems when handling assets with inherently long durations. Also, most of the infrastructure funds[28] do not focus only on toll roads as Macquarie Infrastructure Group (MIG) does. They have a much diversified portfolio. Actually, most of large transactions are power and utility related[29]. But still, the number and size of funds targeting the US toll road sector are astonishing. Table 10 has listed some of the infrastructure funds raised in the past three years, excluding those focusing uniquely on energy deals or regional portfolio[30]. It is easy to notice that most of the funds were founded within a three year range from year 2005 to 2007.

Financial Players' Investment Constraints

Window Period:

As funds grow bigger, they are also under growing pressure to invest the money they raised. They can't sit on the cash indefinitely. As described above, the supply and demand situation in the market is: too much money chasing too few deals. The competition creates few opportunities for the fund managers to get money invested and also get a decent return. The supply constraints might force the investors to look at new infrastructure assets or core assets in developing countries. Regarding large transportation deals, the timing is critical. Toll roads, as a public good, will be subject to intense public scrutinizing once going private. The deal preparation period can be long and unpredictable, as it takes too long to even judge a deal good or bad as well as

[28] Except Macquarie Infrastructure Group (MIG), one of the oldest infrastructure funds under Macquarie
[29] The total value of power utilities deals (electricity and gas) worldwide is US$372.5bn (Pricewaterhousecoopers, 2007).
[30] Regional portfolio refers to a fund targeting only a specific region, such as Indian Infrastructure Fund, or Korean Emerging Infrastructure Fund, etc.

preparing the bidding document[31]. This can also create a long window period. Meanwhile, the committed equity will get locked and can not go anywhere. The impact of the waiting period can be well mitigated if the infrastructure fund has a flexible capital supply and invests "just-in-time". For example, most of the funds have contractual agreement with institutional investors and the latter will only disperse capital allocation when needed[32].

Liquidity:

For infrastructure investment, the liquidity issue is always there. The lack of investment spectrum and benchmarks make the pricing of positions very difficult. When a closed-end fund approaches its maturity, the large amount of transferring of remaining assets in its portfolio to another affiliated long-term fund can cause conflicts in terms of pricing. The only solution seems to be the development of deeper primary markets for pricing and the emerging of secondary market for the sale of such long term assets.

Reputation:

Although infrastructure funds and their sponsors have enough flexibility in acquiring deals, the fundamental rule is that they are investing with OPM (other people's money). As Lawrence and Stapledon (2008) indentified, in cases where a sponsor is acquiring an asset using its own funds, the price must be recoverable and therefore must be 'reasonable' in the eyes of the institutional investors. The last thing they want is that institutional investors cash out (if it is an open-end fund) or stop continuing investing with the fund, reducing the fund size and the management fees.

[31] Investment banker, interview conducted on phone, April 20, 2008
[32] Investment banker, Q&A session following presentation of Annual MIT Center for Real Estate New York Trek, May 1, 2008

Chapter 3 Vision Mismatch within the Private Consortium

A consortium is normally formed by several marginal players; in some individual cases, intra-marginal players from both the financial and operational background. During the interviews conducted, the consensus is that even under the same consortium, there is an obvious short-term and long-term vision mismatch between the private infrastructure funds and toll road developers. This chapter identifies what are the interests and conflicts among them and then further analyzes where the mismatch comes from.

Investing in Form of Consortium

Consortium, a Latin word, refers to partnership, association, or society. A consortium is an association of two or more individuals, companies, organizations, or governments with the objective of participating in a common activity or pooling their resources for achieving a common goal. In the context of PPP's, a consortium is formed by active market players who participate in the bidding process as a single legal entity. As per the current situation, it is necessary to form a consortium in order to consolidate the expertise from different backgrounds, align the investment incentive, diversify the risks, and most importantly, win over the other bidders.

With the rapid growth of infrastructure funds, the toll road developers and operators are no longer alone, although they may be willing to be. They realize that these financial players can help them achieve higher leverage and higher bond ratings from the capital markets and push up the equity return. At the same time, with an investment partner, they can diversify the equity risk. In return, they can offer the expertise in toll road engineering, construction, maintenance, and management that funds and banks are not familiar with.

If we compare the three biggest deals in France and the three deals in the US, it is not hard to notice that for the French deals, without the large presence of financial players from the US, the bidder is normally a single entity (except Macquarie in the APRR deal). On the other hand,

regarding the three deals that have been done in the US, the bidding entity is usually in form of a consortium. The evolution from single company to consortium is a result of more and more infrastructure funds flowing into the market and consortium is expected to be a typical investment form in the future.

Table 11: Bidders for the French and US concessions

APRR[1]	**SANEF**[2]	**ASF**[3]	**Skyway**	**Indiana Toll Road**	**Pennsylvania Turnpike**
2005	**2005**	**2005**	**2004**	**2005**	**2008**
Eiffage /Macquarie	**Abertis**	**Vinci**	**Macquarie /Cintra**	**Macquarie /Cintra**	**Abertis /CitiGroup**
Abertis	Cintra		Borealis/Vinci	Itinere	Ontario Canada Teachers Pension Plan, TransUrban, Goldman Sachs
Autostrade	Eiffage		Abertis	Babcock & Brown / Challenger-Transfield	Macquarie/Cintra*
Cintra	Sacyr			Morgan Stanley/Autostrade	

1. Autoroutes Paris-Rhin-Rhone (APRR), France
2. Autoroutes du Sud de la France (ASF), France
3. Autoroutes du Nord et de l'Est de la France (SANEF), France

Note : first row (bold) are the winning bidders.
* Macquarie and Cintra dropped out of bidding at the last minute
Source: Bel and Foote, 2007; www.landlinemag.com

Investor's Interests and Conflicts

As mentioned above, a typical concession consortium includes two key players: the "financial players" and the "operational players". The financial player normally bears the deal origination risk. In order to participate in a bid, the consortium needs to spend millions of dollars to prepare. If they do not get the bid, all the investment upfront becomes sunk cost and it is the financial player who bears the loss. One of the interviewees mentioned that avoiding such loss is the one

of the key incentives for the financial player to raise the bidding price[33]. Risks are always associated with proper rewards. Once a consortium wins the bid, the financial player will practice the "Macquarie model" and charge various fees, such as origination fees, management fees, etc. The source of the fees, as the interviewee has suggested, should come from the revenue generated by the underlying assets. For the Macquarie case, as he pointed out, these fees can sometimes add up to a huge amount compared to the equity the financial player chipped in.

Table 12: Comparison of Toll Road Private Investor's Characteristics

Investor Types	**Infrastructure funds (Investment banks)**	**Toll road developers**	**Toll road operators**
Vision	Short to Medium term*	Medium to Long term	Long-term
Capital	Non-intensive	Intensive	Non-intensive
Incentive	Speculative / Fee	Speculative / Construction, or Holding / Operating	Holding /Operating
Equity Size	Large	Medium to large	Small

*Depends on the duration of the fund: if it is an open-end fund, the vision can well be long term.
Source: author's summary based on interview notes.

On the other hand, the operational players bring to the table the expertise of developing and operating the toll roads. They as well chip in a relatively large amount of equity to share the risk with the financial players and push up the bid price through leverage in the debt market. After winning the bid, the consortium may need immediate construction and rehabilitation work and then operating work. The operational players will automatically inherit these tasks and make their profit. One of the scholars mentioned that construction companies may cause delays in finishing the work on time, because it is the only period during which they can make money by using their own expertise[34].

[33] Vice president, a Canadian infrastructure fund, interview conducted on phone, March 25, 2008
[34] Professor, Civil and Environmental Engineering, Massachusetts Institute of Technology, interview conducted in person

The interests and conflicts of these market players are also reflected in the preference for project types. They each have different investment preferences, varying from project to project. There are basically three types of projects within the scope of toll road privatization. The definitions vary. In this paper, I will refer to them as Greenfield investment, Rehabilitation investment, and Brownfield investment.

Greenfield investment, as the name implies, refers to an investment that starts from zero. A typical investment cycle includes relative large design and construction risks upfront as well as demand and operating risks during a later phase. For a typical Greenfield project, the investment cycle is normally around five years. When the project is completed and stabilized, the equity investor may choose to reduce the equity share through getting debt refinancing or direct selling. Greenfield investment normally attracts investment from toll road construction and operating companies. Investment banks tend to avoid such deals because of too much uncertainty associated with the project. Greenfield investment is also categorized as capital intensive as the underlying asset can not generate immediate income.

A typical Rehabilitation investment would be obtaining the concession rights for an operating facility, though currently generating cash-flow, which needs significant capital improvements for major repair and maintenance. This type of deal lies in the middle. Construction companies might find it unattractive as there is limited construction work that needs to be done. Investment banks and infrastructure funds, without certain expertise, still consider the investment risky and capital intensive. Unstable cashflow of the underlying assets also reduces their chances to speculate. This type of deal thus becomes particularly attractive to toll road operating companies. Rehab projects have a lower traffic risk than Greenfield projects. Value-added projects with significant rehabilitation, improved efficiency, and better management are their core business. The small amount of construction work can be contracted out.

Brownfield investment refers to investing in assets with well established cashflow and can well be self-sustainable. In case the assets need any capital improvements, the implementation time should be short and capital expenditure should be small. Such core assets are chosen to be privatized mainly because the public agency needs lump-sum cash from the privatization to

bridge short-term budget deficits. They can also capture extra money to spend in areas other than transportation. "Pure financial transaction" investment, as people always refer to this type of deal, is particularly attractive to investment banks because of the low risk and short implementation period. This type of deal is not attractive to toll road operating companies simply because it is too "hot" in the market and competition is too intense. Also, there is not too much improvement that needs to be done.

The investment preferences described above are just in general terms. There are of course some funds that target only Greenfield projects or toll road developers who speculate on core assets. Normally, as an "asset creation process", few controversies[35] arise regarding Greenfield projects except they often fall victim to environmental issues. It is, however, not the case for the Rehabilitation and Brownfield projects as people believe that it is merely a transfer of ownership so that the public sector can capitalize the long-term benefit to meet short-term deficit.

Table 13: Toll Road Project Type and Investor Type

Project type	Investment Type	Contract type	Investor Type
"Greenfield" investment	Opportunistic	Design-Build-Finance-Operate-Transfer (DBFOT)	Toll road construction company, or toll road operator, or a consortium of the two
"Rehabilitation" investment	Value-added	Rehabilitation-Operate-Transfer (ROT)	Toll road operator
"Brownfield" investment	Core	Concession	Infrastructure Fund, or Large Toll road developer or a consortium of the two

Source: author

[35] The government does need to use eminent domain to acquire the land, which always causes controversy.

Above is the summary of the contract, project and investor types. The table contents are, of course, subject to change depending on the asset's location. For example, most of the investors may prefer a Greenfield investment in the United States to a core asset privatization in China or India.

The Vision Mismatch

There are basically not a lot of controversies involved with toll road developers and operators, except their foreign identity. Usually, they are all marginal players and are doing the job that they should do: construct and operate the toll roads. And by the way, all these are real value creation processes, differing from the capital market play. They are long-term oriented because they don't face the duration and liquidity issues like most of the 10-year maturity funds do and they rely on the toll road asset to realize their value. It is assumed that despite the divergence of interests, they keep on teaming up with financial players because they want to be more efficient in the capital and legal market. In theory, these financial advantages that they achieved from forming a consortium have pushed up their investment value in the asset and given them an advantage to win a bid. However, if everyone is teamed up in the market, then the asset's market value will be pushed up close to investment value. If it were true, then not teaming up would definitely lead to losing a bid. These are just the upside advantages. In some cases, they can also hedge the downside loss by continuing to make money even after they are "abandoned" by the investment banks. One professor commented that even if the project company goes bankrupt, these operational players will still be designated to run the toll road and earn management fees, according to the initial contract the consortium signed with the government[36].

One interesting thing to notice is the Net Debt / EBITDA of Cintra. After teaming up with Macquarie for four projects in a row, from the Canada Highway 407 (1999), Sydney Kingsford Smith Airport (2002), Chicago Skyway (2004) and Indiana Toll Road (2005), they seemed to take on enough debt. One of the interviewees commented that Cintra has sold its future growth

[36] Professor, Civil and Environmental Engineering, Massachusetts Institute of Technology, interview conducted in person

and hardly any of their projects is currently making a profit. It is a sign when the investment strategy of the toll road developers gets derailed by partnering with the financial giants.

On the fund side, if it is a privately raised fund, the investment strategy is normally short-term to medium term oriented, depending on the fund's duration. The closed-end fund will start to reduce the equity share as soon as the project gets stabilized or faces good speculative opportunities. Although it seems like flipping the deal, these financial players do need high turnover of capital to invest in other projects, as well as growing funds. The urgency of reducing equity share depends on the duration of the fund as well as the targeted holding period of the asset. A 20 yr closed-end fund has more flexibility than a 10 yr fund. Normally for an infrastructure fund, the Brownfield type of project with short payback period is highly preferred. If the fund decides to cash out from debt refinancing, how does it differ from a subprime homeowner cashing out the equity in his house? Speculative behavior is also not tolerable for the public when it comes to holding a public asset for a long term concession.

After a consolidation of interview notes, it appears that there are normally four channels to reduce the equity share being identified:
(1) Reducing equity through debt refinancing;
(2) Obtaining the maximum dividend after paying off the periodical bond interest;
(3) Securitizing and then selling the future cash flows upfront;
(4) Direct selling the project equity share to external investors.

For example, on 17 August 2005, MIG[37] announced the refinancing of debt in relation to Skyway. The refinancing resulted in the issue of US$1.55bn of new debt to replace the existing debt of US$1.0bn. The refinancing structure provides an immediate return of US$168.2 million of cash to MIG[38] (their initial equity stake was $397m several months before refinancing).

To some extent, it is fair to say that although under the same umbrella of consortium, the interests of the financial player and operational player are not aligned. This is reflected directly

[37] MIG is a public listed fund but the strategy to use refinancing to reduce equity can be used by any financial player
[38] Source: Macquarie Infrastructure Group Aggregated Management Report for the Year Ended 30 June 2006

as a short-term and long-term vision mismatch. The infrastructure funds, with 10-15 yr duration, have relatively short term interests and want to get their equity out quickly, or flip the deal and earn some decent return. In so doing they have increased the risk for the remaining equity partners, the toll road developers, who are often left to deal with long term problems. During the interviews, both the bankers and the developers have emphasized the "rules of the game", although one refers to short-term rule and the other one refers to long-term rule. Knowing that they may end up with a risky short-term play, the developers are still willing to continue teaming up with the banks again and again.

One possible solution to the vision mismatch, as Professor Geltner from Massachusetts Institute of Technology suggested is that "they can deal with this issue through the joint-venture agreement/governance arrangement. For example, establish senior-subordinate capital structure and/or buy/sell agreements that give the developer/operators the sort of long-run control over operations that they want, while giving the financial partner the ability to construct financial engineering and exit flexibility they want (with each party assuming the level of risk in the capital structure suited to their return target and horizon, by means of the subordination and buy/sell structure). It wouldn't be perfect, but it could greatly help with the 'mismatch', I would think."

As the mismatch always exists, to find a good match is not easy for any player. Large toll road developers such as Abertis are actively looking for fund partners. They are selective but also willing to compromise to some extent. After the Pennsylvania Turnpike deal, they may stick to Citigroup for a while. Small toll road operators such as Brisa, although focusing on extracting value from operational leverage, find it difficult to get into large projects and may eventually get bought out by one of their biggest shareholders, Cintra. They just don't have enough chips on the table to play.

Chapter 4 An Exploration of Financial Engineering

This chapter will concentrate on some special financial players in the market - the intra-marginal investors, such as Macquarie Infrastructure Group (MIG), which are criticized by some people as financial engineering based and playing the Ponzi scheme game, as well as being frequent overbidders. Defined as an intra-marginal investor, their asset investment value (IV) is typically higher than the asset market value (MV), which is determined as the price the second bidder can offer. The author has evaluated step by step how the system works to create the discrepancy between IV and MV for these investors. Of course, besides financial engineering, there may be other ways for these intra-marginal investors to increase the IV, such as arbitraging from a relatively loose political and regulatory system in a different country. The author also tried to indentify where the assumptions and constraints are during this nominal value creation process. Based on further calculation, it is found that overbidding with the IV actually "makes sense" for the fund as well as the speculative investors who invest in the fund. The findings are actually to some extent, not applicable exclusively to intra-marginal funds, but also adaptable to marginal funds.

Pursuing the "Macquarie Model"

Institutional investors such as the large pension funds have been trying to gain exposure to infrastructure investing, in order to match their long-term liabilities to long-lived, stable and inflation hedged assets. From the feedback of the Chicago conference, at this early stage of infrastructure investment, most of the institutional investors choose to remain passive and invest through traditional fund vehicles with a preferred fund sponsor, such as Macquarie, Goldman Sachs or Morgan Stanley, even if their ultimate goal is to set up direct investment programs.

Undeniably, among the fund sponsors, Macquarie is perhaps the most experienced and successful. The famous "Macquarie Model" for infrastructure refers to a business model where a sponsoring manager – usually but not always an investment bank – acquires assets and then on-sells them into a separate fund or publicly traded entity but retains management rights (Lawrence

and Stapledon, 2008). In this excellent paper, the authors further questioned a series of issues related to the sustainability of the model and pointed out the importance of distinguishing infrastructure assets from infrastructure funds.

However, for most of the institutional investors, investing in infrastructure assets indeed is equal to investing in an infrastructure fund. If an infrastructure fund can have a constant dollar supply from these investors and the investors are content with their return, then why do we claim that the "Macquarie Model" is not sustainable? The common criticisms are that (1) it is a short-term financial engineering game; (2) the return investors get does not actually compensate for the actual risk that they bear; (3) the system is vulnerable to economic or credit environment change

The analysis of the remaining chapter will be mainly based on the data collected from Macquarie Infrastructure Group (MIG). For those who are not familiar with MIG, it is a public traded toll road fund as well as one of the largest toll road owners. Currently, MIG has a geographically diversified portfolio of 11 toll roads across seven countries. As of 31 Dec 2007, MIG's portfolio is as Figure 3 shows, with the total asset value (market value of the equity portion) of AUD10.2bn. MIG is chosen is because of its fame of financial engineering and also because it has enough portfolio information online, such as key events, income statement, and balance sheet, enabling some calculation. MIG is also chosen to be studied here as it is the direct concessionaire of the only two controversial deals, Skyway and ITR in the U.S. as well as one of the top three bidders for the Pennsylvania Turnpike concession.

STEP 1: Setting up the Fee Structure based on Market Value of Equity

During the interviews, a major controversial income channel identified for Macquarie is their fee structure[39]. The sponsoring entities generate significant fees revenue from originating, financing, selling or managing underlying investments, especially when such entities have competitive investment vehicles, or affiliated vehicles into which assets are transferred between affiliated

[39] The interviewee made comments based on the Chicago Skyway deal. Vice president, a Canadian infrastructure fund, interview conducted on phone, March 25, 2008

funds (Probitas Partners, 2007). It is observed by some analysts[40] that Macquarie charges its funds advisory and underwriting fees on deals and the total is estimated at more than 1% of the transaction value. The bank also charges the funds for refinancing loans as well as "disposition" fees during asset sales. These fees, however, are just the tip of the iceberg.

The manager of the fund, normally a subsidiary of the fund's sponsor, with a position secured by long-term contracts with the fund, charges (1) a base fee, which is often a percentage of the fund's size and (2) a percentage fee, which is a much higher percentage of the amount by which the fund passes a certain threshold (normally compared to a benchmark index)[41].

Take Macquarie Infrastructure Group's (MIG) management fee structure for example,

"Base and Performance Fees are payable by MIG to each of MIIML and MCFEL. The aggregate base fee is currently calculated as 1.25% of the market capitalization[42] of MIG after adding borrowings and firm commitments to invest and deducting uncommitted cash on the balance sheet for a market capitalization of less than $3 billion. Where the market capitalization exceeds $3 billion, a base fee of 1% will apply to the amount in excess of $3 billion.

A performance fee is paid by MIG at 30 June each year in the event that the MIG accumulation index out-performs the S&P/ASX 300 Industrials Accumulation Index (XKIAI) in any financial year, having made up for any under-performance in previous years.

The performance fee is 15% of the amount of the net out-performance and is paid in three equal annual installments……."[43]

There are several controversies involved with an infrastructure fund's fee structure. In the same Fortune article[44], McLean (2007) questioned such fee structure as the fund will have an incentive to add to its collection because the fees are based on the size of the fund. She also mentioned that as the fund gets bigger, the performance fees are dwarfed by the base fees. From the asset level, as one of the fund managers cautioned at the Chicago conference, the toll road asset normally will not significantly outperform in the short-term, making the performance fee hard to foresee anyway. Under such logic, the funds' interest weighs heavily toward growing the size of the

[40] "The Wizards of Oz: Not making sense of Macquarie's business model", www.breakingviews.com
[41] The source is from the discussion note during the investing in infrastructure (i3) conference in Chicago, 2007
[42] Market capitalization is a measurement of corporate or economic size equal to the share price times the number of shares outstanding.
[43] http://www.macquarie.com.au/au/mig/investor_centre/faqs.htm
[44] "Would you buy a bridge from this man?" by Bethany McLean, Fortune editor-at-large

funds in order to secure the base fees, regardless of the risk and return features. In Lawrence and Stapledon (2008)'s paper, they found that in nine out of 15 infrastructure funds, the manager's fees were a double-digit percentage of operating cashflow and they charged high fees even when cashflow was negative.

Most of the infrastructure funds do not publicly release their fee structure information. In order to compare, random interviews have been conducted with several professors and colleagues at the MIT Center for Real Estate regarding the fee structure for real estate funds. A common feedback is that for opportunistic funds, the base fee is applied only to the initial cash that investors invested in the fund. For example, if a fund charges a 1% base fee and the investors put into the fund $100 today, then the fund can charge only $1 base fee per year. That being said, if the fund's investment is very profitable and the next year $100 initial investment turns out to worth $200, the fund still charges $1 base fee (although the performance fee will be higher). It was also commented that to some extent, the fund can only charge a base fee based on the investment committed, which means, if the investors put in $100 at the initial stage and the fund invested only $50 this year, then it can only charge 1% based on $50 but not $100.

For MIG, the fee structure is obviously different but quite similar to the core property fund in the real estate context. As quoted above, MIG charge a base fee of 1.25% of the market capitalization of MIG and a performance fee of 15% when fund's accumulation index outperforms the S&P/ASX 300 Industrials Accumulation Index. By definition, market capitalization refers to the total market value of a fund's outstanding shares, calculated by multiplying the fund's shares outstanding by the current market price of one share. Take MIG for example. On 30 June 2007, the total number of securities on issue was 2,516,791 and the price per security on that day was AUD3.6. Then the total market cap is AUD9.1bn.

Price per security $\approx$ *Fund's Net Asset Value per security* (1)

Market Capitalization = Price per security x Total number of securities outstanding (2)

Base fee = 1.25% x Market Capitalization (3)

Performance fee = 15% x (Fund's Accumulated index – Benchmark index) (4)

Other fees = 1% x Asset's transaction value (5)

STEP 2: Increase Market Value of Equity Using DCF Method

Equations from the Balance Sheet

Since the base fee - a very important revenue channel - depends on the size of the fund, it makes sense for the fund to increase the fund's market capitalization. Based on formulas (1) and (2), it seems that increasing the market cap actually is equal to increasing the fund's net asset value (NAV). NAV is the total value of the fund's portfolio less liabilities, which is equal to the fund's equity value. If we check the Skyway's Book value based balance sheet in Appendix I, we can find the following formula:

Total assets = Current assets + Property & Equipment (P.E.) + Concession right (6)
Total liabilities = Current liabilities + Long-term debt + Equity (7)
Total Assets =Total Liabilities (8)

The equation also holds in a fair value based balance sheet. There are not too many differences between book and fair value of current assets, P.E., current liabilities, and long-term debt. The market value of equity is directly related to the market value of the concession rights. While the market value of the concession rights is hard to measure, with all other factors fixed and with equation (8) holding, it seems the only way to increase the NAV is through increasing the total asset value. And that is exactly what MIG did.

Reducing risk premium

The financial engineering will come to play at this phase. A common way to evaluate the asset value, as indicated on the website of Hochtief[45], an infrastructure concessionaire from Germany, is using the Discounted Cash Flow (DCF) approach. For example, it indicated,

[45] http://www.hochtief.com/hochtief_en/964.cnt

"HOCHTIEF uses a discount rate of 13 percent for the airport holdings in its portfolio…… in cases where the right to sell for a fixed price exists…… this yields a weighted discount rate of 11.16 percent for our PPP portfolio…… As projects move toward completion, risk and hence the markup drops and the asset value rises."

For most infrastructure funds, the DCF method has gained wide acceptance. In this approach, the fair value of an asset is presented in the form of Net Present Value (NPV). The DCF procedure consists of three steps (Geltner et all, 2007):

1. Forecast the expected future cash flows generated by the underlying asset;

2. Ascertain the required total return;

3. Discount the cash flows to present value at the required rate of return.

We can also find the following notes in MIG's Financial Interim Report[46],

"The area involving a higher degree of judgment or complexity is related to the measurement of investments in financial assets, which are measured at directors' estimates of fair value. Discounted cash flow (DCF) analysis is the methodology applied in the valuation framework……for valuing interests in toll road, bridges and tunnels …… The discount rate applied to cash flows of a particular asset comprises the risk free interest rate appropriate to the country in which the asset is located and a risk premium reflecting the uncertainty associated with the cash flows……the risk premium applied in the valuation of APRR was reduced to 6.0% at 31 Dec 2007 (30 June 2007:8.0%) reflecting reduced uncertainty over future toll yields and continued operational efficiencies."

Table 14: The Risk Premiums change of each toll road under MIG (2005-2007)

	Risk Premium				
Date	**31-Dec-07**	**30-Jun-07**	**31-Dec-06**	**30-Jun-06**	**2005**
407 ETR	3.5%	3.5%	4.0%	4.0%	4.2%
Skyway	5.5%	5.5%	6.0%	6.0%	6.5%
South Bay Expressway	7.0%	7.0%	N/A	7.5%	8.0%
Wstlink M7	5.0%	5.0%	5.5%	5.5%	7.0%
Dulles Greenway	7.0%	7.0%	7.5%	7.5%	7.5%
Indiana Toll Road	6.0%	7.0%	7.5%	7.8%	7.8%
APRR	6.0%	8.0%	12.0%	18.0%	18.0%

Source: author consolidated with the data in MIG financial report and interim financial report 2006, 2007

The key concept here is that as the underlying assets becomes more mature toward construction completion or stabilization year by year, the fund will discount the assets' cash flow with a lower

[46] http://www.macquarie.com.au/au/mig/acrobat/mig_finreport_dec08.pdf

and lower discount rate, creating a larger and larger asset present value, which equals to the asset's market capitalization value. The risk premium reductions of the assets under MIG are shown in Table 14. This principal (or strategy) is widely applied in all kinds of commercial real estate asset evaluation. This process could make some sense for a development project. But for pre-existing stabilized assets such as Skyway and ITR, it is less defensible.

Figure 3: the Investment Portfolio of MIG as 31 Dec 2007

MIG INVESTMENT PROFILE
AS AT 31 DECEMBER 2007

Asset	Location	Description	Toll increase mechanism	% MIG stake	Asset value 31 Dec 2007 (A$ million)	% of MIG portfolio
407 ETR	Toronto	Operating	Market based with traffic thresholds	30.0	3,770	37
M6 Toll	Birmingham	Operating	Market based	100.0	3,026	30
APRR	France	Operating	% of inflation	20.4	1,079	11
Westlink M7	Sydney	Operating	Inflation (quarterly)	47.5	776	8
Dulles Greenway	Virginia	Operating	Subject to regulation – tolls specified to 2012	50.0	468	4
Indiana Toll Road	Indiana	Operating	Specified truck toll schedule and fixed car toll until 2010 – thereafter, greater of CPI, 2% or nominal GDP per capita	25.0	355	3
Chicago Skyway	Chicago	Operating	Specified toll schedule until 2017 – thereafter, greater of CPI, 2% or nominal GDP per capita	22.5	307	3
Tagus River Crossings	Lisbon	Two operating toll bridges	Inflation	30.6	236	2
South Bay Expressway	San Diego	Operating	Market based	50.0	187	2
Warnow Tunnel	Rostock	Operating	Minimum of inflation unless IRR > 25.0%	70.0	3	0
Total					10,208	100

Source: Macquarie Interim Report, http://www.macquarie.com.au/au/mig/acrobat/miginterim_report_08.pdf

The increase of assets' market value

It is necessary to clarify the data in the Figure 3 in the previous page. For example, for the Chicago Skyway, MIG holds 22.5% at the equity stake with an estimated value of A$307m while for the Indiana Toll Road, MIG holds 25% with an market value of A$355m. The date is 31 Dec 2007. If we check the historical exchange rate between AUD and USD, the rate is 1USD=1.14AUD. This means that MIG has $269m and $311m in each project's equity portion respectively.

For the Chicago Skyway, if $269m accounts for 22.5%, that means the total equity value in the project is $1.2bn. It is far more than the residual equity amount (~$332m), calculated by the difference of the $882m initial equity they put in and the ~$500m equity reduction through debt refinancing. This huge difference is actually created only through adjusting the risk premium.

Table 15 is author's calculation of all MIG's asset value change from year 2005-2007. On average, the equity value of each road is increasing by 30% each year. This actually means that the base fee that the fund can charge is increasing by 30% per year.

Table 15: MIG's Toll Road Equity Value increase 05-06, 06-07

	Asset Equity Value 2005 $m	Asset Equity Value 2006 $m	Asset Equity Value 2007 $m	Asset Equity Value Increase % (05-06)	Asset Equity Value Increase % (06-07)
407 ETR	7,932	7,706	11,023	-3%	43%
M6 Toll	1,839	2,017	2,654	10%	32%
Dulles Greenway	628	702	821	12%	17%
Westlink M7	1,021	1,159	1,433	14%	24%
Skyway	808	875	1,197	37%	37%
Tagus River Crossings	610	633	677	4%	7%
South Bay Expressway	165	291	328	77%	13%
APRR		2,910	4,640	n.a	59%
Indiana Toll Road		813	1,246	n.a	53%

*Exchange rate is based on the exchange rate at the end of each year as noted in the report

**Skyway's equity reduction through debt refinancing in 2005 is included

Source: author's calculation; MIG Interim report 2006, 2007, 2008

Discrepancy between the Two Accounting Rules

After witnessing the project equity's soaring under the "mark-to-market" fair value accounting rule, we may also want to check each project's equity value under book value accounting. Appendix I attached is the balance sheet of Skyway Concession Company Holdings, LLC for both year 2005 and 2006. In Dec 31, 2006, the book value of equity is $368m, while the fair market value of equity is $875m. How can a real asset create such an equity discrepancy (~138% difference) under two accounting rules, in only one year's time? If we further take a look at the Skyway's income statements, for 2005 and 2006, the company is actually running on budget deficit, losing $40m to $100m per year. Of course, as Table 16 shows, this is not only in the Skyway case. If we take a look at the other toll roads within MIG's portfolio, almost none of them provide positive cashflow after paying interest and insurance.

Table 16: The Contrast of Project's Book value vs. Fair value

	2005		2006		2007	
Project Equity	**Book Value**	**Market Value**	**Book Value**	**Market Value**	**Book Value**	**Market Value**
Skyway	**403**	**808**	**368**	**875**	**N/A**	**1,197**
Indiana Toll Road	**N/A**	**N/A**	**572**	**813**	**N/A**	**1,246**
Dulles Greenway	**(-333)**	**628**	**(-360)**	**702**	**(-380)**	**821**

N/A=not available

Source: author's calculation; data is derived from each project's balance sheet

An embedded assumption

In terms of revaluating the portfolio's total asset value, the infrastructure funds like MIG have actually started with a big assumption, which is:

Assumption I: the forecasted growth of expected future cash flows is reasonable, and it is justifiable with the initial risk premium and thus remains unchanged once the bid is made.

If we step back for a second and think through the whole logic, it hardly makes any sense. The assumption of traffic cashflow has directly determined the bid price and is reflected by the value of "concession right" on the balance sheet. For Skyway, when the bid winner was announced, the assessed $1.5bn concession right stays on the balance sheet as it becomes the fair market value. People seem to forget the 161.4% bid spread between the winning bidder and the second bidder. Is the $1.5bn is the true market value of the concession right? If it is not, then how can we say that the cash flow assumption is reasonable in the first place? Further, even if the assumption is reasonable, given how aggressive it is, how can we conclude that the initial risk premium was well justified? Reevaluating the project market value without challenging the initial traffic assumption seems not appropriate. From the very beginning, actually ever since the winning bid was announced, no one seems to be concerned with the revenue assumptions anymore.

Pricewaterhousecoopers is auditing Skyway's balance sheet every year, on which we can also find that:

"The Company used an outside independent appraiser to help determine the fair values of the various assets associated with the Concession and Lease agreement"

At this stage, it seems that we went back to the question raised at the very beginning of the paper: were the Chicago Skyway or Indiana Toll Road deals overpriced? The difference is that at this point, "knowing the answer" is not important any more since the deal is already a déjà fait. However, acknowledging the consequences of "still not knowing the answer" is very crucial because the toll road assets under long term concessions have become a tool for some funds to speculate on.

Where is the end?

Another fault of this value creation process is that the stock price is becoming kind of predictable. It is easily observed that the risk premium of each project is reducing by 50-100bps every year and creates a nominal growth of the fund's asset value. But this gradual reduction will finally come to an end. The stock price, if really matching the NAV, will thus face predictable growth

every year as long as the fund continues lowering the risk premium. Once the risk premium is reduced to the "bottom", all the investors may want to cash out from the fund (even at a price below current NAV) as there is no potential "growth" any more. At that time, a fund like MIG will face real problems.

One strategy the fund may take is to keep on divesting the assets under management to other affiliated funds and substituting with newly acquired assets. From table below, we will observe MIG's assets under management change from year to year.

Table 17: MIG's Asset under Management Change 02, 04, 06

31-Dec-02		31-Dec-04		31-Dec-06	
Asset	**Proportion of MIG's portfolio (%)**	**Asset**	**Proportion of MIG's portfolio (%)**	**Asset**	**Proportion of MIG's portfolio (%)**
407 ETR	35	407 ETR	32	407 ETR	35
Tagus River Crossings	4	Tagus River Crossings	4	Tagus River Crossings	3
Warnow River Crossing	2	Warnow Tunnel	0	Warnow Tunnel	0
Eastern Distributor	10	Eastern Distributor	12		
M5	6	M5	8		
M4	1	M4	1		
SR125	1	SR125	3		
M2	1	M2	2		
Other	0	Other	0		
Yorkshire Link	1				
Midland Epressway	20				
Cintra assets	15				
Transurban City Link	3				
		M6	32	M6	31
		Westlink M7	6	Westlink M7	9
				APRR	9
				Dulles Greenway	5
				Indiana Toll Road	3
				Skyway	3
				South Bay Expressway	2
Total	100	Total	100	Total	100

Source: author, based on data provided by MIG's interim Report 2003, 2005, 2007

STEP 3: Asset Level Illiquidity and Capital Level Liquidity

At this point, we have realized that although a project itself may not make money and keeps on eating off the equity portion on the balance sheet, the market value of the equity portion can still double every year.

The "fair value", or market value, is defined as "the price at which an asset or liability could be exchanged in a current transaction between knowledgeable, unrelated willing parties" and "the objective of a fair value measurement is to estimate an exchange price for the asset or liability being measured in the absence of an actual transaction for that asset or liability" (Landsman, 2006). Then what if there is actually no liquid market and the core business is not directly related to market valuation, just as the Skyway or ITR project? It probably means this core asset is a good candidate for speculation as no one can really figure out what is the true market value is.

This type of financial engineering will not work well in a commercial real estate market. For example, if there is a fund having a portfolio of office buildings, each office building can actually be precisely priced because: (1) the annual cash flow is estimated based on its performance in the past and the rent clearly indicated in the lease contract; (2) the value of the building can be assessed based on frequent transactions as there is a very active "secondary"[47] market and various appraisal agencies; (3) there are other office buildings in the same block, with the same property characteristics that can serve as market comps.

Regarding the toll road asset, take the Chicago Skyway for example,
(a) The toll revenue is hard to estimate because there is no contractual agreement between the road users and the concessionaire. The owner can constantly change toll prices and the users' response is hard to estimate;
(b) There is no liquid market and no benchmark. No one is selling Skyway constantly;
(c) Skyway is unique, and there is no parallel toll road that can serve as market comps.

[47] Usually the term "secondary market" refers to trading of financial claims or securities, such as mortgages or equity shares. Here it refers to is the property asset market itself, in which the underlying (physical) assets are traded.

As a result, when a toll road project is marked-to-market, it becomes very hard to challenge the validity of the price. In this sense, the toll road can be more or less comparable to the internet companies when they first started during the dot-com era and no one really knows how much the company is worth at an early stage. Frim's stock prices were driven sky high and created a bubble.

Having illiquidity in the asset level is "good" but a fund still needs "nominal" liquidity at the capital level for the fund's old investors to have an option to realize the equity return created through financial engineering, maybe right after new investors come in. Having a public traded fund is thus very important. This step is commonly referred by an expert like Jim Chanos as the "Ponzi scheme". As long as there are enough people trading on this platform created based on financial engineering, the system based on speculation will not collapse. Actually, this may be a more "intellectual" version of Ponzi scheme because at least they have relied on a speculative underlying asset instead of nothing.

STEP 4: Maintaining the Financial Engineering System

Maintaining capital level liquidity is not that easy as the stock price relies not only on the fund's calculation of the asset value. The fund must also have enough cash-flow liquidity to support (1) the quarterly or semi-annual distributions; (2) the gigantic amount of fees they charge; (3) buying back stocks during a stock market "winter" period. However, the only absolute truth is that most of the toll road assets in the portfolio are not generating positive income. Where does the cash flow liquidity come from to support this system?

Channel 1: Distribution out of capital

Lawrence and Stapledon (2008) have observed that the underlying assets' cash flow cannot support the distribution as well as the fee, and actually the yield delivered by several infrastructure funds is from operating cashflows and from capital. They also implied that part of

the reason why MIG has part of stapled securities registered in Bermuda is to make this financing channel legal.

Table 18: Distributions and Fees as percentage of operating cash flow

Entity	Fees / OCF-2006	Distributions/ OCF-2006	Distributions/ OCF-2005	Distributions/ OCF-2004
Australian infrastructure fund (AIX)	29%	183.7%	390.3%	217.4%
Babcock & Brown Infrastructure (BBI)	10.1%	33.8%	92.9%	154%
Macquarie Airports (MAP)	6.9%	50.2%	17.4%	94.9%
Macquarie Communications Infrastructure Group (MCG)	7.1%	42.8%	26.8%	40.4%
Macquarie Infrastructure Group (MIG)	31.9%	167.1%	623%	182.3%

Source: a selection and consolidation from Lawrence and Stapledon (2008).

Channel 2: Distribution out of Debt

Getting money from debt refinancing to support other activities does not sound new to most of us. The behavior is basically not that different from the subprime mortgage borrowers. The fund bought a road with a $1bn debt and in several months, it refinances the road with a $1.5bn debt. In this way, it obtains $500m in no time. For example, in the Skyway deal, MIG pocketed $168m in cash only months after the transaction was completed. This actually opens up a channel for the fund to arbitrage and take advantage of the inefficiency of the debt market.

Channel 3: The Internal Asset Transferring System

One of the interviewees[48] and one presenter [49]at an infrastructure seminar both mentioned that a larger infrastructure fund sponsor, after purchasing a toll road asset, can also diversify the

[48] Vice president, a Canadian infrastructure fund, interview conducted on phone, March 25, 2008
[49] Investment Banker, Q&A session after presentation at "14th Annual International Development Conference" at Harvard University, April 7 2008

project's risk through selling the project equity share to its various internal funds, depending on the performance and maturity of the underlying asset. In this sense, being a larger fund sponsor to backup a bid seems crucial in terms of comparing the "diversifying power". Imagine the cost of purchasing an asset as a piece of stone. The impact of throwing a stone into a lake is far less than throwing into a puddle.

Besides this vertical asset transferring system, there is another horizontal asset transferring system. One fund not only purchases project shares from its sponsor, it can also buy shares from other affiliated funds. Edward Chancellor and Lauren Silva wrote the following paragraph in their online article[50]:

"The fancy price paid for the ITR was not popular with shareholders back home in Australia. By the spring of last year (2006), MIG's share price was trading at a substantial discount to net asset value, as calculated by Macquarie's valuation model. That criticism was muted once half-stakes in these businesses were sold to another fund, the unlisted Macquarie Infrastructure Partners and the sale proceeds were used to buy back MIG's shares."

According to Figure 3, Macquarie Infrastructure Group (MIG) indeed divested 50% of its interest in the Chicago Skyway and Indiana Toll Road to Macquarie Infrastructure Partners (MIP), retaining a 22.5% and 25% interests in each asset. This horizontal asset transferring is setting up a very important mechanism to create the internal cash flow liquidity. This basically allowed the cash circulating within the Macquarie Empire to "mend the holes" in various funds. To make things even more attractive, this internal transferring system can also guarantee that the Macquarie's nominal asset value remains unchanged, since all the pricing is based on the same Macquarie model.

Channel 4: Direct Selling of Assets

The last immediate cash resource is through direct selling of assets. This might also be the last channel that a fund wants to use. For sure there are good assets that the fund can sell at high prices. For example, Macquarie has sold nine assets - most recently a stake in the Rome airport -

[50] "The Wizards of Oz: Not making sense of Macquarie's business model", www.breakingviews.com

to third parties for more than $8 billion, or 2.3 times the original equity invested in them[51]. There are for sure also some other assets, if sold in the secondary market, that would have to be sold at a huge discount because (1) the market is illiquid; (2) the Macquarie pricing model does not apply externally.

STEP 5: Perverse Investment Incentive

If the whole financial engineering system still holds 'till this step, then there are actually some anti-intuitive conclusions that can be made based on this. For example, knowing that an investment value (IV) in one asset is much higher than the market value (MV), the fund will still bid on the high end of IV, instead of adding just a little over MV. This behavior may actually be well perceived and supported by some of the fund's speculative security holders.

Table 19 is a numerical example. Imagine there are two funds bidding on one asset, one is called "rational" and the other called "irrational". In case 1, the "rational" bidder assumes an annual income cash flow of $10, a growth rate of 2%, a discount rate of 11% while using 60% leverage, while in case 2 the "irrational" bidder assumes an 8% growth rate, a discount rate of 15% while using 75% leverage. In this way, the irrational bidder wins the bid. Months later, the irrational bidder lowers the discount rate by 1% and creates a nominal equity return of 67%. Curiosity drives the irrational bidder to see how much equity return the project can create if he were in the rational bidder's shoes: only 31%! He will then say: luckily I bid so high! Now I can charge 1% fee on the $60 equity value and 15% on the 67% equity return that I created.

[51] "Would you buy a bridge from this man?" by Bethany McLean, Fortune editor-at-large

Table 19: A numerical example of higher bid having advantage in extracting extra value

	Rational time 0	Irrational time 0	Rational time 1	Irrational time1
Cash flow at present	10	10	10	10
Toll growth rate	2%	8%	2%	8%
Discount rate	11%	15%	10%	14%
Bid price / Assessment Price	111	143	125	167
LTV	60%	75%		
Debt	67	107	67	107
Equity	44	36	58	60
Equity Creation			14	24
Norminal Equity Return			31%	67%

note: adjusted discount rate is 100bps lower than before
Source: Author

This process can be mathematically proved. For example, there are two bidders, 1 and 2. "A" stands for the project's asset value, "F" is the asset's income cash flow in perpetuity (since a 99 year lease is very long), r_f is the risk-free rate, r_p is the risk-premium, g is the assumed growth rate of future cash flow. The assumptions are: $r_{p1} \le r_{p2}$, $g_1 \le g_2$, and most importantly $r_{p2} - g_2 \le r_{p1} - g_1$. It means that bidder 2 has made aggressive toll revenue assumptions and also increased its risk premium. Although it may look like a garbage-in-garbage-out (GIGO) assumption, it is actually even worse as the bold growth assumption is not well compensated by the risk premium.

From,

$$A_1 = \frac{F}{r-g} = \frac{F}{r_f + r_{p1} - g_1} \qquad (7)$$

$$A_2 = \frac{F}{r-g} = \frac{F}{r_f + r_{p2} - g_2}$$

We can get that $A_2 > A_1$, so that bidder 2 wins the bid.

Months later, if bidder 2 "creates" more equity value through lowering the project risk premium by Δ while maintaining all the other assumptions, then he will get,

$$\Delta E_2 = A_2^{'} - A_2 = \frac{F}{r_f + r_{p2} - g_2 - \Delta} - \frac{F}{r_f + r_{p2} - g_2} = \frac{F \times \Delta}{(r_f + r_{p2} - g_2 - \Delta) \times (r_f + r_{p2} - g_2)} \qquad (8)$$

Compared to bidder1's position if bidder1 had won the bid,

$$\Delta E_1 = A_1^{'} - A_1 == \frac{F \times \Delta}{(r_f + r_{p1} - g_1 - \Delta) \times (r_f + r_{p1} - g_1)}$$

We can notice that bidder 2 created more equity value: $\Delta E_2 > \Delta E_1$, which is directly reflected by a higher fee in an absolute amount.

As in the Indiana case, Macquarie/Cintra not only bid much higher, they also used higher leverage in the deal structure than other bidders: $t_2 > t_1$. If we calculate the equity return,

$$\frac{\Delta E_2}{E_2} = \frac{\frac{F \times \Delta}{(r_f + r_{p2} - g_2 - \Delta) \times (r_f + r_{p2} - g_2)}}{\frac{F}{r_f + r_{p2} - g_2} \times (1 - t_2)} = \frac{\Delta}{(r_f + r_{p2} - g_2 - \Delta) \times (1 - t_2)} \qquad (9)$$

$$\frac{\Delta E_1}{E_1} = \frac{\Delta}{(r_f + r_{p1} - g_1 - \Delta) \times (1 - t_1)}$$

Thus, $\frac{\Delta E_2}{E_2} > \frac{\Delta E_1}{E_1}$, they actually can create more "nominal" equity returns than other bidders too.

For fund sponsors, this semi-GIGO method actually creates a great opportunity: the more they bid, the more fees they can charge. On the other hand, the more they bid, the more "nominal"

return they can make for their fund security holders per dollar equity invested and keep them happy. All they need to do is to "believe" and make others "believe" that their aggressive assumption of the future toll revenue is achievable and thus has a lower risk premium than it seems.

Also not to neglect, if we assume the base fee is k %, then

$$k \times \frac{E_2 + \Delta E_2}{E_2} = k \times \left[1 + \frac{\Delta}{(r_f + r_{p2} - g_2 - \Delta) \times (1 - t_2)} \right] \qquad (10)$$

represents the "fee generating ability" of each dollar from the equity that the fund put in.

Obvious, comparing with the two bidders,

$$k \times \frac{E_2 + \Delta E_2}{E_2} > k \times \frac{E_1 + \Delta E_1}{E_1}$$

A Triple Loaded Betting System

The direct impression of the finding above is kind of counter-intuitive: if one spends more in bidding, he/she should get less return. However, in the fund's case, it is actually a triple-loaded betting system.

Equity level bet: the fund is playing with OPM (other people's money) – if we win the game, we both win; if we lose the game, you lose.

Debt level bet: higher leverage achieved by cheap debt will create an incentive for the fund to bid more. It is the same as the subprime borrowers who were willing to pay ridiculously high prices for their houses. They sometimes have a negative equity portion in the house and that drives them to gamble that the housing price will keep on going up. Here is another analogy. If there were an office building with a market value $100, I could purchase it with either 50% leverage or 90% leverage and I am not the only bidder in the market who wants it. A common

suspicious is that if I can achieve 90% leverage, I will bid more than the market value. In another words, reducing the equity portion in the deal will lead to a tendency to overbid.

Project level bet: the more they bid on a project, the more nominal equity return they can create through financial engineering, upon which they can charge the base fee. It is important to point out that these fees are front loaded once they win the bid. This gives the fund manager the incentive to bid a price right at the maximum acceptable range, which is their investment value.

A good analogy would be a gambling game: You don't know how to play "black jack" and you've hired me to play for you. You provided the money and I can pocket a percentage fee based on the total profit that I made with the money. With the money you gave me, I contact 'Joseph-A-Bank' and get a 9x loan. Now, I am sitting at a table in Vegas. At each round, I may have a tendency to call and play a big hand regardless the risk. If I win the game, we all win; if I lose the game, you lose first and then the bank. Now, imagine that the dealer told us that the winning hand will not be announced for one year because some MIT students "break the Vegas" tonight and I am also from MIT. I will probably say to you "hey, we might win here later but for the meanwhile, lend me more money and I will pay you annual interest back and let's go to Atlantic City."

Chapter Summary

'Till this step, the sustainability of such financial engineering systems relied on several more assumptions. It is "sustainable" as long as:

(1) No massive numbers of investors cash out from the fund and force it to liquidate the portfolio's toll road assets at a deep discount;
(2) No one can precisely justify the "improperness" (if assuming there is any) of the risk premium adjustment;
(3) There is enough cash for them to distribute.

I guess what I am implying here is that unless we can precisely justify that Macquarie has overpaid on those toll roads, we cannot claim such financial engineering system is unsustainable.

We can only say that the system is unstable because it is speculating on an illiquid asset and it is subject to too many cashflow constraints. If there is anything absolutely inappropriate from the Macquarie side, I think it is that they have securitized the asset's nominal future cashflow upfront and charged a fee based on the nominal market value of equity. If all the projects, like the Sydney Airport deal, turn out to be good investments and all the high bids are well justified, the fee is considered to be reasonable; if any of the projects fail, Macquarie will not charge any more fees but they will not return the fee they have charged either.

From this chapter, we also realize that the asset investment value (IV) of a fund is actually two fold: for the fund manager, it is how much fee they can charge based on the nominal value they created; for the fund's security holders, it is how much nominal return they can realize in cash, even if through a Ponzi scheme. Certainly, the fund manager understands how the financial engineering works. Regarding the fund's investors (security holders), it is not known whether they are insiders or not. Imagine if both the manager and investors are clear with the rules of the game, then their investment interests are actually aligned. Their strategy is: bid at the IV and arbitrage from the newcomers. However, there is high risk involved with this process as there may not be newcomers to buy the fund's stock. But the manager does not take any risk because their fee is front loaded and it is the current fund's investors who bear the total risk. If the fund's investors are not aware of the financial engineering or they are very risk-averse, then they will break the rules of the game. To some extent, we can say that the actual asset investment value is decided by the risk preference and asymmetric information equilibrium among fund's investors.

For the fund sponsor, speculating on toll road assets actually opens up a channel for them to arbitrage between the uncertain future and 100% present, as well as the inefficiency of both the debt market and equity market. To keep the channel open, having a gigantic fund sponsor seems very necessary. It is because any profit or loss of any project or any cash liquidity can be well distributed through its internal asset transferring system while guarantee the internal pricing mechanism. However, that does not mean that the system is not vulnerable and not subject to the credit market condition changes.

Chapter 5 Credit Crunch and Market Correction

Leveraged Buyout

One investment banker from Goldman Sachs commented that it is obvious that the Skyway and ITR deals in the US fit into the category of leveraged buyout (LBO). LBO occurs, when a sponsor acquires an asset and where a significant percentage of the purchasing price (equal to bid price) is financed through debt.

Table 20: The deal structure of Chicago Skyway and Indiana Toll Road ($million)

Project name	Chicago Skyway	Indiana Toll Road
Cintra Equity	485	385
Macquarie Equity	397	385
Bank Loans	948	3030
Total Cost	1,830	3,800
Loan-to-Value ratio	51.8%	79.7%

Source: author; Federal Highway Administration, USDOT

The Brownfield projects such as Skyway and the Indiana Toll Road are good targets of leveraged buyout because their already reliable cashflows can make regular loan payments after the completion of the transaction. LBO is often a sign of speculating because the investors normally have a low equity portion at stake. Truly, in 2005, only a year after the concession of the Chicago Skyway, the Skyway Concession Company LLC issued $439million series A senior secured floating rate bonds due in 2017 and $961million series B senior secured floating rate bonds due in 2026[52]. The investment consortium reduced equity exposure by almost 50% in no time.

During the interview, there was a common belief that when financing a deal, the higher leverage ratio (financing with more debt) will lead to a higher bidding power and higher equity return.

[52] Source: Chicago Concession Company LLC bond offering memorandum

This does sound familiar given the calculations the author made in the previous chapter based on financial engineering. However, theoretically, according to the Modigliani-Miller theorem (M&M), the value of the project should remain constant regardless of whether it finances itself with debt or equity. Higher leverage should induce a higher interest rate on debt as the project risk is higher. What should not be neglected is that it was before 2007 and the debt was then very cheap.

The Credit Crunch

The subprime crisis in 2007 has caused a debt market freeze. Nevertheless, the consensus is that there is always sufficient capital for good projects. Energy infrastructure projects like natural gas pipelines and liquefied natural gas developments can raise capital despite recent global market turmoil[53]. For those intra-marginal investors replicating the Macquarie model, they will be significantly affected.

In the previous chapter, the author has listed the criteria for a financial engineering based fund to be sustainable. Now let's validate their condition in the credit crunch:

(1) No massive numbers of investors cash out from the fund forcing it to liquidate the toll road assets at a deep discount: during the credit crunch, there are definitely people pulling out money from the fund as they more or less acknowledged that funds like MIG had taken on too much debt. This has caused the fund's stock price to plunge by 15-20%. MIG, however, has managed to buy back its stock and keep the price at a reasonable level, so that they don't need to liquidate the assets.

(2) No one can precisely justify the "improperness" (if assuming there is any) of risk premium adjustment. It is true that there is no one who can quantify the risk premium of toll road investment but during the credit crunch, the risk premium automatically gets higher as investors become risk averse. Fortunately for the fund, the risk free rate is getting lower, offsetting the rise of the risk premium. What we do know is that if the asset level discount rate rises by even 50bps, MIG's total asset value will take a deep bath.

(3) There is enough cash turnover for them to distribute.

[53] http://www.reuters.com/article/oilRpt/idUSN1336867120080213

Regarding point (3), the author indentified five capital resources in the previous chapter that are important to maintain a functioning system. The credit crunch inevitably impacted all of them.

a. Revenue generated by the underlying asset: this is the least affected revenue source although most funds still blame the downturn of the economy and the rising gasoline prices have reduced the traffic volume.
b. Ponzi schemes: raising equity through frequently issuing new securities is getting harder as people tend to be more prudent when making investment decisions. There should be a short supply of investors into infrastructure funds. However, this is not the absolute case. If as Lawrence and Stapledon (2008) have warned, investors do not distinguish between investing in infrastructure assets and funds, then they tend to invest more money in funds during this period as infrastructure is always advertised as a safe asset.
c. Debt refinancing: this channel is largely closed. Regarding this point, industry people do not express special concern as most of the project refinancing will take place in two to five years, when the credit market is expected to get back to normal. However, what they have neglected is that refinancing can no longer be a capital raising resource in the short term. They can not arbitrage the debt market any more.
d. Internal transferring of assets: this can go on forever. However, the transferring price will be subject to scrutiny as the fund's investors are more alert with every penny that goes in and out. The Macquarie pricing model may not work that smoothly without any challenge because at least the interests of investors of different funds are not aligned.
e. Direct selling of assets: there is not a very active secondary market. When debt becomes very expensive, the purchasing price for such assets should be on the lower end. If they sell the asset to external buyers where Macquarie pricing model does not apply, it will be no surprise that most of the assets may sell at a big discount.

As a result, during the credit crunch, the capital inflow resources have been generally reduced. At the same time, the loan interest & principal payments are going up due to the "adjusted rate of mortgage" type of loan structure. This will leave an infrastructure fund very little equity at its disposal in order to avoid any cash flow delinquency. To make things worse, leveraged-buyout is becoming more and more difficult and achieving a loan-to-value ratio around 50% is expected

for a large toll road project, reduced sharply from an 80% LTV about a year ago. The shortage of both equity and debt has made it difficult for funds to leverage buyout the big projects. The fact that Macquarie and Cintra dropped out from the Pennsylvania Turnpike deal is not a coincidence.

From a fund's perspective, when the cash flow is becoming very precious, they do not want to invest in a credit crunch environment. From equation (10), we know that when the leverage ratio is low, the fee generating ability per equity dollar is low. If invested, the fund will get lower fees, incur more debt payment and reduce internal equity liquidity, so it will be better to retain the capital for the moment.

If we assume the credit crunch started from July 2007[54], the impact can be observed in three ways. The most direct one is that the Macquarie and Cintra duo dropped from the bidding of the Pennsylvania Turnpike and the top three bids' spread was within 10% range. The winning bid, Abertis Group has a debt-to-equity structure close to 55:45 compared to ITR at 80:20, and across interest rate spread has increased ~50-100bps[55]. Secondly, if we track Macquarie Infrastructure Group's stock value, as shown in Figure 4, it plunged by 15% during Aug 2007. It also forced MIG to buy back its stock from mid-Aug, 2007. Despite the quarterly dividends, the stock value has not recovered yet. With the same concept, in Figure 5, we can do a comparison of the stock value of three toll road developers and operators since the credit crunch of 2007, Abertis from Spain, Cintra from Spain and Brisa from Portugal. As we can see, during the month August 2007, Cintra, the familiar co-investor of Macquarie Infrastructure Group in several deals, took the biggest hit. So far in 2008, the stock of Cintra has always been outperformed by its two other competitors.

All of above are actually theories and signs showing how intra-marginal investors' investment value, built on cheap debt and financial engineering, gets decreased during the credit crunch. The bid price of the asset will start to come back to its fundamental market value which is supported by its cashflow and well accepted by the marginal investors.

[54] http://www.marketoracle.co.uk/Article2751.html
[55] Source: "Pennsylvania Turnpike demonstrates MIG's value", Macquarie Research Equities, Wednesday May 21, 2008

Figure 4: The impact of the Credit Crunch to Macquarie Infrastructure Group's stock (July 07 –present)

Source: author; Yahoo! Finance

Figure 5: Comparison of stock value of three toll road developers during the credit crunch

Note: blue=Abertis, red=Cintra, green=Brisa
Source: author; Yahoo! Finance

Chapter 6 Conclusion

Based on the limited transactions that have been completed in the U.S., this paper defines the concept of infrastructure investment in various ways, offers the economic and legal background of toll road privatization and identifies the active market players.

The first part of the paper addresses the marginal players. Within a project consortium, the financial player does have a dominant position in the early stages of deal structure. The different investment incentive has created a short-term and long-term vision mismatch between the financial player and operational player.

The second part addresses the intra-marginal players who can often do positive NPV deals. For them the asset investment value is the value they created by using assets as a tool to speculate on, which is fundamentally different from marginal investors, who extract value from the asset's cash flow. A good example is MIG and those funds which adopt the Macquarie model. For them, fee structure triggered the motivation of funds to extract extra value through adjusting the asset risk premium and creates an illusion of high asset value for its investors. As a result, the investment value of assets based on the illusion value has derailed from its fundamental market value, where all the other marginal players may trade on. Such speculative behavior has led to several emerging signs of investment bubble. However, due to the lack of benchmark and secondary markets, these signs are not easily observed.

In the third part, it is observed that the credit crunch following the recent burst of the housing bubble has started a market correction period across all investment asset classes. There are also signs of a burst of the infrastructure bubble. The credit crunch has weakened the IV of intra-marginal investors and will start a market correction period, leading the asset price toward MV. When the market correction period is over, the toll road market may either become more speculative than before as the channel of cheap debt (re)financing will be largely opened again, or become more rational. Government and regulatory agencies can play a critical role in guiding and regulating the asset bidding process. This part is not further explored in this paper.

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Appendix I: Skyway Concession Company Balance Sheet, Dec 31, 2006

Skyway Concession Company Holdings, LLC and Subsidiary
(A Delaware Limited Liability Company)
Consolidated Balance Sheets
December 31, 2006 and 2005
(in thousands of dollars)

	2006	2005
Assets		
Current assets		
Cash	$ 524	$ -
Restricted cash	35,312	1,926
Accounts receivable, net of allowance for doubtful accounts of $68 and $23 as of December 31, 2006 and 2005, respectively	3,175	4,426
Receivable from related parties	1,208	-
Prepaid expenses	3,309	3,156
Total current assets	43,528	9,508
Property and equipment		
Bridges and roads	334,614	322,949
Buildings	1,003	1,003
Leasehold interest in land	8,619	8,619
Leasehold improvements	422	214
Vehicles	1,131	1,132
Skyway equipment	457	362
Furniture and fixtures	772	752
Computers and office equipment	2,695	2,613
	349,713	337,644
Less accumulated depreciation	(14,384)	(6,769)
	335,329	330,875
Projects in progress	25,852	1,080
Net property and equipment	361,181	331,955
Concession rights, net of amortization of $29,568 and $14,281 as of December 31, 2006 and 2005, respectively	1,483,790	1,499,077
Deferred financing costs, net of amortization of $1,132 and $269 as of December 31, 2006 and 2005, respectively	12,690	13,510
Prepaid expenses, net of current portion of $3,013 and $2,959 as of December 31, 2006 and 2005, respectively	31,534	35,461
Security deposits	23	23
Derivative asset	2,840	417
Cash reserve accounts	81,637	122,937
Total assets	$ 2,017,223	$ 2,012,888
Liabilities and Members' Equity		
Current liabilities		
Accounts payable	$ 1,386	$ 1,117
Due to related parties	204	-
Accrued other liabilities	7,138	1,263
Accrued interest	6,042	4,099
Total current liabilities	14,770	6,479
Derivative liability	75,074	53,058
Long term debt	1,559,488	1,550,000
Total liabilities	1,649,332	1,609,537
Members' equity		
Members' capital		
One unit issued at no par value	508,430	508,430
Accumulated other comprehensive income (loss)	227	(6,328)
Accumulated deficit at the end of the period	(140,766)	(98,751)
Total members' equity	367,891	403,351
Total liabilities and members' equity	$ 2,017,223	$ 2,012,888

The accompanying notes are an integral part of these consolidated financial statements.

Source: Skyway Concession Company Holdings, LLC and Subsidiary Financial Statements Dec 31, 2006 and 2005 http://www.macquarie.com.au/au/mig/acrobat/financials_skyway_dec06.pdf

Appendix II: Skyway Concession Company's Income Statement Dec 31, 2006

Skyway Concession Company Holdings, LLC and Subsidiary
(A Delaware Limited Liability Company)
Consolidated Statements of Operations
Years Ended December 31, 2006 and 2005
(in thousands of dollars)

	2006	2005
Revenues		
Toll revenues	$ 56,198	$ 50,430
Lease revenues	42	49
Total revenues	56,240	50,479
Operating expenses		
Routine maintenance - roadway	1,469	1,358
Routine maintenance - structures	317	271
Routine maintenance - tolling and buildings	392	395
Toll collection operation	3,088	3,389
Salaries and wages	1,651	1,973
Other office and administrative expenses	2,133	2,704
Rent	99	159
Insurance	1,843	1,443
Depreciation and amortization	22,905	21,050
Total operating expenses	33,897	32,742
Operating income	22,343	17,737
Derivatives loss	(26,148)	(24,691)
Interest expense, net	(38,210)	(88,634)
Net loss	$ (42,015)	$ (95,588)

Source: Skyway Concession Company Holdings, LLC Income Statement Dec 31, 2006
http://www.macquarie.com.au/au/mig/acrobat/financials_skyway_dec06.pdf