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MAF 03: Public-Private Partnerships in South Africa: A tale of two prisons

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Abstract

A public-private partnership is a contractual arrangement between a public entity and the private sector in order to enable the provision of services relating to infrastructure-based projects. A PPP project will include a concession agreement with an SPV, which will enter into contracts to finance, build and operate an infrastructure project for a fixed period of time. In order to overcome the significant overcrowding of prisons, the Departments of Correctional Services and Public Works adopted a procurement model of privately built and operated prisons from the UK. The South African government entered into two contracts for maximum-security prisons in Bloemfontein and Louis Trichardt with a concession period of 25 years. However, these prisons have been criticised due to the significantly higher costs of operating these PPP prisons.

This study analyses the project economics and funding arrangements of these two prisons to evaluate whether the costs, terms and financing rates were fair. The study analyses the NPV of the total costs of each prison as well as the cost per inmate and undertakes a comparable analysis of the IRRs, the costs of equity and implied equity premiums of these prisons in relation to PPP UK prisons and hospitals. The study also compares the cost per inmate in relation to PPP UK prisons. The cost per inmate for the South African prisons compares favourably to the cost per inmate in the UK, both on a capital expenditure and on an operating cost basis. However, the costs compare unfavourably to the costs of the public prison system.

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The two South African prisons were highly geared and use was made of long term fixed rate debt at a time of historically high interest rates. The equity IRR and equity premium of Bloemfontein was significantly higher than Louis Trichardt and the latter's equity premium was aligned to equity premiums reported for PPP hospitals in the UK around the same time. The study benchmarks the total costs and financing costs and indicates how financing costs were impacted by unfavourable market conditions at the time of procurement. These projects were locked into high real interest rate yields and the use of floating rates or CPI-linked debt would have reduced costs over time. However, floating interest rates would have resulted in exposure to interest rate risk and significant cash flow and tax risks unless such risks were factored into contract prices.

1. Introduction

If structured and procured properly, Public Private Partnerships (PPPs) allow governments to pursue infrastructure projects in an efficient and cost effective way, offering value for money to the public and in some cases even enabling the development of infrastructure assets where traditional procurement would otherwise not have been possible (CBI, 2011).

Definitions for PPPs vary by country, framework and author. For the purposes of this paper, we understand a PPP to refer to a partnership between the public and private sector, where a private sector party participates in or provides support for the provision of infrastructure-based services (Ng and Loosemore, 2007). Delivery of the project is done through special purpose vehicle set up and typically financed from equity and debt in a highly leveraged structure (Spackman, 2002). As part of the partnership, the private party bears responsibility for financing, designing, building, operating and/or maintaining an infrastructure project for a set period of time (Kwak, 2009). This study explores South African prison PPPs as a case study.

Problem statement

The problem of overcrowding and the cost of prisons in South Africa has been a key issue for government policy and funding in an environment of budgetary constraints and competing developmental objectives. A number of recommendations were made to reduce the cost of South Africa's prison services, including entering into PPPs to reduce costs and improve operating efficiencies.

This study analyses the two prison PPPs in order to determine whether these PPPs managed to achieve cost efficiencies and whether the PPPs led to a lower cost of prison services, including the cost of financing of these two prison projects.

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Research questions

The case study analyses the first two and only South African prison PPPs, which have been subject to significant criticism over their costs. Particularly, we focus on the following research questions:

- what was the background to the procurement of the prisons and what were the key terms and details of the projects;
- what were the total cost of the prisons and how do these costs compare to United Kingdom (UK) prison PPPs;
- what were the financing terms and were these fair; and
- could alternative financing solutions or structures have been used to bring savings to the public sector?

Firstly, we provide a background and an overview of these projects before reviewing key terms including the project structure, project costs and financing terms. We then calculate, analyse and benchmark the total costs of the projects before turning our attention to the financing costs. Financing costs are broken down (into cost plus a margin), analysed and benchmarked to assess whether the costs were priced competitively. We then isolate the impact of financing on the total cost of these projects and analyse if money could have been saved through employing some of the alternative funding methods.

2. Overview of the prison services and the PPP projects

Around the millennium, South Africa found itself at a significant shortage of prison space, which led to an overcrowding in the existing state-owned prison system. In order to address the problem of overpopulation, South Africa's departments of Correctional Services and Public Works imported a procurement model of privately built and operated prisons from the UK. The prisons were to be procured as PPPs and government called for private sector bids for the design and construction of 11 maximum-security prisons. Shortly after the public announcement, the number of prisons to be procured was revised down to only two contracts due to an underestimation of costs. In 2000, the South African government signed two 25-year concessions for maximum-security prisons in Bloemfontein and Louis Trichardt.

The winning consortia were responsible for designing, building, financing and operating the prisons before transferring them back to government after a 25 year operating term [a Design Finance Build Operate Transfer (DFBOT) contract] (Farlam, 2005). According to Ramagaga (2001), the South African overcrowding problem at the time was severe. The existing 241 prisons held a total of 162 162 prisoners but only had capacity for 118 154 people overcrowding the available prison space by as much as 37% (Ramagaga, 2001).

The first project procured as a PPP, was the Manguang prison in Bloemfontein (the “Bloemfontein prison”), which opened in July 2001 and became fully operational in January 2002. The second project was the Kutama-Sinthumule prison at Louis Trichardt in Limpopo (the “Louis Trichardt prison”) which opened in February 2002 (Open Society Foundation for South Africa, 2003).

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Shortly after the appointment of contractors and operators, the two PPP prisons became a topic of debate as the institutions were contracted to operate at much higher standards than prisons built and run by the public sector. Higher standards meant that these two prison PPPs attracted higher costs on a per prisoner basis than what existing public prisons were costing at the time. Critics of the PPP prisons argued that the costs far outweighed the claimed benefits of privatisation, and went as far as saying that high costs of these two prisons impacted the rest of South Africa's corrections system. Inquiries and reviews into the issue have shown that thousands of public sector jobs had to be frozen due to the money being allocated to the private prisons. While the two privately run prisons provided some additional capacity to the overall system, this was not nearly enough to address the general problem of overpopulation in the prison system.

Since then, South Africa's prison population has continued to rise resulting in even more overcrowding in the public prison system. As the private prisons are protected from overcrowding, additional prisoners have had to be accommodated within the state-run prisons (Open Society Foundation for South Africa, 2003).

In 2002, the National Treasury conducted a review of the two prison PPP deals providing some background to the deals and analysing their costs. According to the National Treasury, the specifications were designed with "inputs in mind rather than outputs". More specifically, the specifications for the prisons were imported from UK prisons, which had much higher standards than what was the norm for existing prisons, which resulted in a lack of parity to the rest of the country's correctional services system. The review also found that at the time of planning of the prisons, Treasury regulations for the procurement of PPPs were not yet in place. This lack of regulation meant that no feasibility study was conducted to test affordability, risk transfer and value-for-money. While the high specifications were a key factor contributing to the high cost of the prisons, this was deemed to be not the only cause. The review found that, among other factors, the high base interest rates at the time of the deals and a "higher than normal return on equity, reflecting the perceived risk of early deals", pushed up the long-term cost of the prisons to the public sector (National Treasury, 2003).

Du Plessis suggests that it was due to the high specifications and a high cost of financing at the time of procurement, that these prisons came at a cost which was forecast to take up roughly five per cent of the Department of Correctional Services' annual budget until at least 2026. In an effort to reduce costs, the Department of Correctional Services commissioned a consortium to try and find ways to make the private prisons more cost-effective. The consortium reported back in 2006 concluding that the contracts were inflexible and changes to the terms were impossible (du Plessis, 2012).

The Bloemfontein prison contract was signed in March 2000 with an opening date of July 2001 and a full capacity date of January 2002. The Louis Trichardt prison contract was the second South African PPP prison contract with an opening date of February 2002 and a full capacity date of September 2002. Both prisons were built with a similar capacity for around 3000 inmates.

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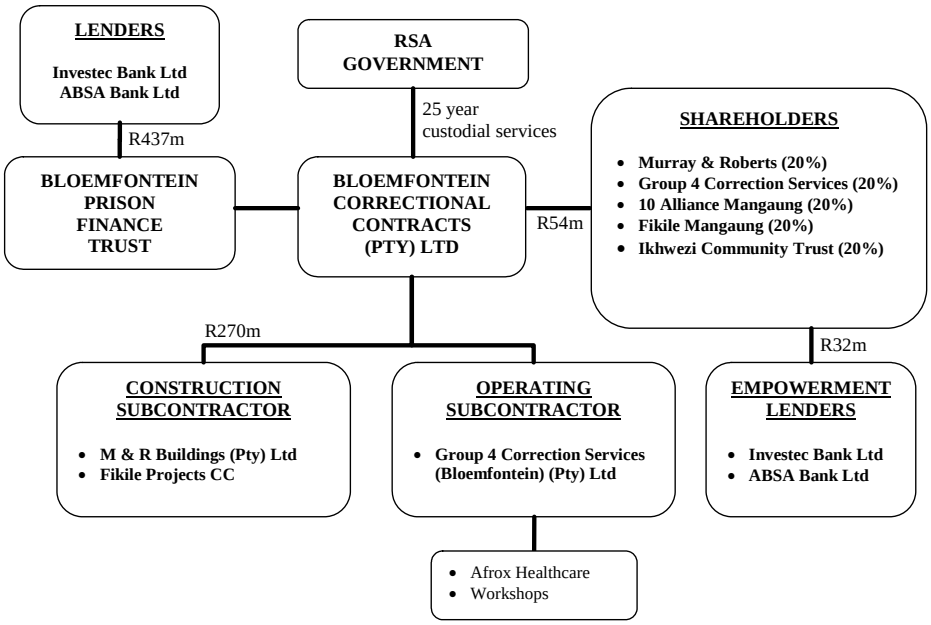
3. Ownership structures and contractual relationships

The Bloemfontein prison

Bloemfontein's PPP contract carried a 25-year operating term. Five equity investors each financed the project obtaining a 20% stake in the project. Notably, a large portion of the equity finance was financed by loans from empowerment lenders to the equity providers. Effectively, this increased the overall gearing on a look-through basis from an equity/debt ratio of 11:89 to a ratio of 5:95. The lenders provided financing to the SPV through a special trust, which was set up to provide debt finance to the project.

Construction and operations were subcontracted to separate providers out of the project SPV. Overall, the structure resembled that of a standard PPP. While the project gearing was high, this is not uncommon for projects receiving an availability payment based revenue stream (National Treasury, 2003). Figure 1 depicts the ownership structure of the Bloemfontein PPP project.

Figure 1: Bloemfontein prison PPP ownership structure



Source: National Treasury (2003)

The Louis Trichardt prison

The Louis Trichardt PPP contract also carried a 25-year operating term. Two equity investors financed the project, each obtaining a 50% stake in the project. The lenders provided financing to the SPV through a special trust set up to provide debt finance to the project. As with the Bloemfontein PPP, construction and operations were subcontracted to separate providers out of the project SPV. As with the Bloemfontein contract, the structure for the project also resembled that of a standard PPP contract (National Treasury, 2003). Figure 2 depicts the ownership structure of the Louis Trichardt PPP project.

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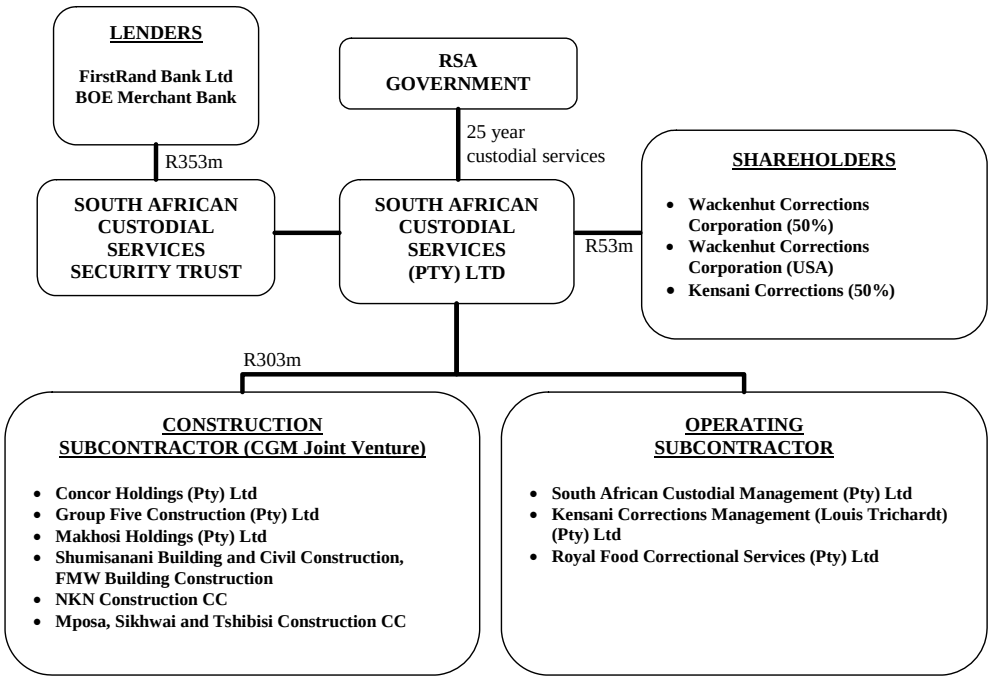
Figure 2: Louis Trichardt prison PPP ownership structure



Source: National Treasury (2003)

3. Methodology

This study follows a case study methodology by undertaking a detailed analysis of two related projects, being the analysis of the costs and financing of the two PPP prisons in South Africa, which may affect public policy in the future. Case studies can be exploratory, explanatory and descriptive (Yin, 1993). Creswell (2003) defines the case study approach as the exploration in depth of a program, an event, an activity, a process, or one or more individuals and further states that the case is limited to a specific time period and activity.

This study undertakes a triangulation of data sources in relation to the structure and costs of two PPP prisons. This study applies macroeconomic data at the time and undertakes a comparative analysis by evaluating the costs of the South African PPP prisons to the costs of UK prisons and other PPP projects. Furthermore, corporate finance theory is applied to the data, as set out by the National Treasury, in order to derive some generalisations in regards to the costs of operating and financing of prisons using the PPP model.

4. Data Analysis

4.1 Project economics

The total capital expenditure for the Bloemfontein prison was R435 million (approximately R954 million in real 2014 terms) of which R270 million (approximately R592 million in real 2014 terms) related to construction costs. Total capital expenditure for the Limpopo prison was R392 million (approximately R829 million in real 2014 terms) of which R303 million (approximately R640 million in real 2014 terms) related to construction costs. On a per

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inmate basis, the Bloemfontein prison came in slightly more expensive than Louis Trichardt costing R148 566 per inmate compared to R129 630 (National Treasury, 2003).

It is noted that the pre-operating interest/fees for Louis Trichardt were significantly lower than for Bloemfontein. While insufficient information is available to determine the driver behind this difference with certainty, it is possible that the difference may have been caused by different drawdown profiles and priorities. The low pre-operating interest/fees for Louis Trichardt suggest that equity may have been drawn down before debt with most debt being drawn down towards the end of the construction period.

Table 1: Summary of prison PPP costs and capacity

Project	Bloemfontein		Louis Trichardt	
	Nominal	Real (2014)	Nominal	Real (2014)
Number of inmates	2,928		3,024	
Total capital expenditure (R million)	435	954	392	829
Construction (R million)	270	592	303	640
Pre-operating interest/fees (R million)	104	228	26	55
Start-up costs (R million)	58	127	49	104
Capital expenditure per inmate (R actual)	148,566	325,678	129,630	273,978
Construction cost per inmate (R actual)	92,213	202,145	100,198	211,774

Source: Nominal figures as per National Treasury (2003), real 2014 figures based on own calculations

4.2 Availability payments

While both projects were designed as availability payment type PPPs, the indexation mechanism of the availability payments for each project differed slightly. Both projects negotiated a variable and a fixed fee component. The fixed fee component is a non-indexed portion payable on a Rand per inmate capacity basis. The variable fee component is also payable on a Rand per inmate capacity basis, but is indexed at CPI inflation, which is further adjusted by a “K-factor”. The availability payment for both projects was thus adjusted by inflation plus the project specific factor on a semi-annual basis.

The Bloemfontein contract variable fee increased at inflation plus a factor of 0.623% in year one of operations. The factor thereafter slowly increased year on year to end up at inflation plus 0.789% in year 25 of operations. This profile seems to have been sculpted to more closely match project cash inflows to cash outflows. The key driver behind this profile was the forecast inflation of certain cost elements which was assumed to increase at a rate higher than CPI inflation (National Treasury, 2003).

The Louis Trichardt contract followed a slightly different schedule aiming to achieve a smoothing of returns, rather than a link to cost inflation. The K-factor for this contract was set at 1.06 (1 + 6%) in year two, decreasing by 0.01 (1%) every second year until it reached 1.00 in year 14 after which it stepped down to 0.97 (1 – 3%). Based on this profile, revenues increase at a higher rate than CPI inflation during early years and at a lower rate in later years. Project Finance deals typically are cash constrained in early years, while the project is still ramping up and while debt balances are at their highest levels.

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For this reason, it is not uncommon for debt repayments to be sculpted during early periods, or for developers to negotiate capital grace periods to defer the repayment of debt principal. The downside for equity investors is that cash constraints during early years make it difficult to extract cash from the project, which can negatively impact equity returns. It is the authors' view that the K-factor for the Louis Trichardt contract would thus have allowed for a better smoothing of returns and resulted in the project being less cash constrained during early years.

As previously discussed, the payments for both projects were broken down into a fixed and variable component. The payments for both prisons were payable per inmate on a monthly basis over a period of 25 years from the start of operations. The payments are summarised in the table below.

Table 2: Payments for the prison PPPs in real 2002 terms

Project	**Bloemfontein**	**Louis Trichardt**
Variable fee per inmate (R' actual, 2002)	132.20	86.45
Fixed fee per inmate (R' actual, 2002)	83.50	73.91
Total fee per inmate (R' actual, 2002)	**215.70**	**160.36**

Source: National Treasury (2003)

The combination of fixed and variable fees with the variable fee being adjusted by a factor is a good example of how an availability type payment can be sculpted to smooth a project's cash flows. This technique is particularly useful for projects, which have cyclical or lumpy cash flow profiles. When paired with high gearing, cyclical or spiked cash flow profiles may present a challenge to projects using fixed rate debt. Normally, in order for such project to be able to meet debt service and stay within covenant requirements, debt repayments have to be sculpted and significant reserve accounts may have to be put in place. While sculpting the debt usually is not a problem for bank finance, it is not as easy to achieve a sculpted repayment profile if bond finance is used. However, there are still ways to effectively structure a project with bond finance even when project cash flows are lumpy. Such structures aim to manage variability and maximize flexibility while at the same time reducing cost. One such option is a structure, which combines bond finance with bank loans and/or facilities (such as a revolving credit facility). In such a structure, the more flexible bank loans and/or facilities act as a buffer for bond finance by offering more flexible repayment terms. Variability in cash flows is thereby absorbed by the more flexible bank loans and/or facilities while repayments on bonds remain fixed.

Crucially, having to sculpt debt may be seen by lenders as an indication of a more risky project, thereby attracting higher margins. Sculpting revenues presents an alternative to debt sculpting where the smoothing of cash flows is achieved through sculpting of cash inflows, rather than cash outflows. This technique can significantly decrease project risks and make a project more attractive from a financing perspective. A public sector considering this option should keep in mind that the required (real) budget requirement for a project would change from year to year (i.e. payments increase at a different rate than CPI). This may present a problem from a budgeting point of view in cases where a fixed portion of the budget would normally be set aside (which may increase by CPI inflation each year).

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Another alternative solution is inflation-linked debt, which has a natural hedge to revenues, which typically are also inflation linked. The key issue around inflation-linked debt is that the market appetite for such typically is not as large as for fixed rate debt (although currently there is increased demand for inflation linked bonds due to inflation uncertainty). Nonetheless, it presents an attractive alternative, which is analysed in more detail later in this study.

4.3 Analysis of total project costs

The 2002 National Treasury review suggested that the specifications of the prisons were designed with "inputs in mind rather than outputs" and that the specifications were imported from UK prisons which had much higher standards than what was the norm for existing South African prisons (National Treasury, 2003).

As the 2002 National Treasury review does not present the total public sector cost of the prisons, we estimate this by calculating the total estimated net present cost of payments[13] at the respective contract dates. We note that the overall cost of the two prisons is relatively similar with the Louis Trichardt prison being approximately 5% more expensive on a per inmate basis than the Bloemfontein prison. We have estimated the total cost assuming forecast inflation of 6% at contract date, as well as outturn inflation to 2014 and 6% thereafter.

Table 3: Net present cost of prison PPP payments

Project	Bloemfontein	Louis Trichardt
Net present cost using forecast inflation of 6% *(Actual inflation to 2014 and 6% thereafter)*	R1730 million *(R1718m)*	R1824 million *(R1792m)*

Source: Own calculations

To assess National Treasury's argument that specifications being imported from UK prisons led to high total costs, we compare the total project costs calculated above to the costs of six Scottish PPP prisons procured at a similar time. Similar to the Bloemfontein and Louis Trichardt PPPs, these Scottish prison contracts were procured as PPPs of a design, build, finance, operate and maintain nature. Similarly to the South African prisons, the Scottish prisons were paid for using an availability payment mechanism over a 25 year operating period (PricewaterhouseCoopers, 2001).

The total cost for the Scottish prisons was calculated by PricewaterhouseCoopers as part of a review commissioned by the Scottish Executive Justice Department using a similar methodology to the one we applied in calculating the net present cost of South African PPP prisons. We have converted this cost into South African Rand to present the total cost per prison before calculating the cost per inmate and per inmate per year.

Notably, the total costs (discounted) of the South African PPP prisons were R1 717 million and R1 792 million respectively, which is less than the average total cost of the UK PPP prisons, which was R2 140 million. Despite having similar total costs, the South African prisons offered approximately six times the capacity of the UK prisons.

[13] Calculated by discounting the forecast payments over the project life. Discounted at 13.53% and 13.05% being the yield on the long-term (20 year) government benchmark bond at the time of agreement for Bloemfontein and Louis Trichardt respectively.

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On a per inmate basis, the cost per prisoner was R586 749 for Bloemfontein and R592 593 for Louis Trichardt, compared to an average cost per prisoner of R3 609 264 for the UK prisons. On a per inmate per year basis (based on the 25 year operating term), this translates to R23 470 and R23 704 for Bloemfontein and Louis Trichardt and an average of R144 371 for the UK PPP prisons. The cost per inmate in the South African PPP prisons was therefore approximately one sixth of the cost per inmate in the UK PPP prisons.

However, there are limitations of undertaking a comparative analysis of the costs of the South African prisons to the costs of the UK prisons. This may be due to differences in specifications, differences in building codes, land values, differences in labour rates, and may be indicative of the nature of competition and firm concentration in the construction and security sectors as well as the imposition of other regulatory constraints. Yet, despite these limitations, the significantly lower costs of the South African prisons in comparison to the UK prisons should lead to a more balanced view in relation to understanding the drivers of the costs of the PPP prisons in South Africa.

Table 4 presents the net present cost per inmate of the South African prisons as compared to the UK prisons.

Table 4: Net present cost of prison PPP benchmarked against UK prisons

	Contract date	Total net present cost* Rm	Capacity	Cost per inmate	Cost per inmate per year
Bloemfontein	24/03/2000	1718	2928	586,749	23,470
Louis Trichardt	11/08/2000	1792	3024	592,593	23,704
Lowdham Grange	7/11/1996	1974	500	3,948,000	157,920
Kilmarnock	30/11/1997	1799	500	3,598,000	143,920
Ashfield	29/06/1998	1581	400	3,952,500	158,100
Forest Bank	2/07/1998	2551	800	3,188,750	127,550
Rye Hill	22/07/1998	1922	600	3,203,333	128,133
Dovegate	24/09/1999	3012	800	3,765,000	150,600
Average UK prison		2140	600	3,609,264	144,371

*Total net present cost of UK prisons as at March 2001 and converted into South African Rand at an exchange rate of ZAR/GPB of 12.252

Source: Own calculations based on cost data as per PriceWaterhouseCoopers (2003)

The above analysis shows that even though specifications may have been imported from UK prisons, the cost per inmate was significantly lower for the South African prisons.

4.4 Financing terms

Both projects were financed with debt and equity. The Bloemfontein project employed senior debt while the Louis Trichardt Project used senior debt and subordinated debt. Both projects were highly geared with equity to debt ratios of 11:89 (5:95 on a look-through basis) and 13:87 respectively. The Bloemfontein prison negotiated debt with a 13-year tenor[14], a 2.25% margin and no capital grace period.

[14] The tenor refers to the term length of debt or a loan.

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The Louis Trichardt Prison negotiated debt with a tenor of 18 years, a 2.50% margin and a 20 months capital grace period. The base interest rates at the time of agreement were fixed at 14.58% and 15% respectively (National Treasury, 2003). Based on an average inflation rate of 5.4% in the year 2000, we calculate the real base interest rates at 9.18% and 9.6% respectively. The cost of debt is analysed and benchmarked in more detail later in this report. Detailed data in regard to the cost of the debt financing arrangements are presented in Table 5.

Table 5: Financing terms of prison PPPs

	Bloemfontein	Louis Trichardt
Funding		
Equity (R million)	54	53
Total debt (R million)	437	353
Total funding (R million)	491	406
Senior debt		
Debt: Equity ratio	11/89	13/87
Tenor (post construction) - number of years	13	18
Repayments	Quarterly	Monthly
Grace period	None	20 months
Nominal base interest rate	14.58%	15.00%
Real base interest rate	9.18%	9.60%
Cost of Debt (margin on base rate)	2.25%	2.50%
Return on Equity	29.90%	25.10%

Source: Data based on National Treasury (2003); real interest rate and debt to equity ratio based on own calculations

4.5 Analysis of financing

As suggested by the 2002 National Treasury review, the high costs of financing at the time of procurement were key cost drivers behind the two projects. Both projects were financed using a leveraged project finance structure. Financing costs can therefore be broken down into the cost of debt and the cost of equity. While the analysis presented in this paper will review both cost elements, the focus is on the cost of debt, which has received the most criticism.

4.5.1 Methodology

In the following analysis, we first discuss and benchmark the cost of equity and cost of debt for the two projects. Due to a lack of publically available comparator information on South African PPPs, this benchmarking exercise is limited to a high-level analysis.

Thereafter, we estimate the cost of financing using the terms specified in the 2002 National Treasury review. We argue that market conditions at the time of procurement were highly unfavourable with base interest rates being close to a historic high.

Farlam (2005) argued that inflation-linked debt could have decreased the total costs of the two projects. To assess his argument, we estimate the total cost of financing using an inflation-linked debt structure. Following the discussion of debt financing, we discuss the options and benefits of refinancing the original debt under more favourable market conditions.

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Lastly, we consider some of the alternative financing solutions discussed earlier in this paper and discuss whether any of these could have presented an alternative lower cost financing solution. We give particular focus to the option of a government contribution.

We perform the analysis of debt by isolating the estimated total debt service from the remainder of the project, as insufficient detail was available to model the entire project cash flows in detail. As the Department of Correctional Services gave bidders the option of a partially indexed availability payment with a K-factor, the profile of cash in- and outflows would have matched very closely, with project revenues following the overall cost profile.

The close matching of project cash in- and outflows means that there should be limited interaction effects between individual cash flows, allowing us assess and compare individual cash flows in isolation. The costs calculated in this exercise can therefore be directly compared among scenarios.

4.5.2 Benchmarking the Cost of Equity

Equity returns for Bloemfontein and Louis Trichardt were shown to be 29.9% and 25.1% nominal (National Treasury, 2003), implying real equity returns of 23.2% and 18.6% respectively[15]. With 20-year government benchmark bonds yielding 13.53% on 24 March 2000 and 13.05% on 11 August 2000 (at the contract dates), the respective equity premia for Bloemfontein and Louis Trichardt can be calculated at 16.4% and 11.9% respectively. To test whether the equity returns were market related, an equity return benchmarking exercise should have been conducted during the feasibility study.

It is important to note that at the time of procurement and due to the prison PPPs being the first South African PPPs, no or limited comparable transaction information would have been available at the time. The returns would therefore have had to be benchmarked against a different group of assets or projects.

Today there is limited potential to analyse the returns in hindsight by considering comparable project finance transactions, which have taken place since then. Some comparators can be obtained from the South African REIPPPP (Renewable Energy Independent Power Producer Procurement Programme), which, according to Eberhard, Kolker and Leigland (2014), targeted 17% real equity returns in the first procurement round. This equates to approximately 24% nominal based on 6% CPI inflation[16]. To isolate the effect of underlying market rates at the time, we calculate and base the benchmarking on the equity premium.

The equity premium is the excess equity return over and above a risk-free benchmark rate. The implied equity premium can therefore be calculated by subtracting a benchmark risk-free interest rate (such as the yield to maturity on a government bond with a similar maturity) from the total equity return as measured by the nominal equity internal rate of return (IRR). This can be illustrated by the following equation where ERP presents the equity premium, E(r) the equity return and E(*rf*) the risk free rate.

$$ERP = E(r) - E(rf)$$

[15] Based on an average inflation rate of 5.4% in the year 2000.
[16] Based on the upper band of the target inflation rate and historical rates, which have been close to 6% in recent years.

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The nominal returns thus imply an equity risk premium of 15.5% for the REIPPPP Round1. This would indicate that the prison PPPs may have been reasonably priced, keeping in mind that the procurements took place approximately 10 years apart and the projects had inherently different risk profiles (Eberhard, 2014). The equity risk premium for the REIPPPP of 15.5% was higher than the Louis Trichardt PPP prison but lower than the Bloemfontein PPP prison.

Table 6: Prison PPP equity returns benchmarked against REIPPPP Round 1

Project	Nominal Equity IRR	Real Equity IRR	Equity premium
Bloemfontein	29.9%	23.2%	16.4%
Louis Trichardt	25.5%	18.6%	11.9%
REIPPP Round 1	24.0%	17.0%	15.5%

Source: Equity IRRs based on National Treasury (2003) and Eberhard (2014); equity premia based on own calculations

There is no publically available comparator information on South African PPP deals and while international comparators are of limited significance, such international benchmarks may offer an indication of whether the returns of South African Prison PPPs were within an acceptable range. A limitation with this type of comparison is that it ignores macro, regulatory and legal factors specific to a project and country.

With this caveat in mind, we consider a number of *Private Finance Initiative* (PFI) deals in the UK healthcare sector, which were procured at a similar time as the two South African Prison PPPs. The deals considered are typical social infrastructure *Design, Build, Finance, Operate* (DBFO) PFIs procured between 1997 and 2002. Hellowell reports the equity returns for the 10 PFI deals between 1997 and 2002 to have a range of between 12.43% and 22.58%.

This suggests an average return of 16.56% and a median of 15.65% (Hellowell, 2013). Based on these figures we calculate the range of equity premia at between 7.93% to 16.90%[17] with the average implied equity premium at 11.20% and the median equity premium at 10.63%. The approximate real equity IRRs[18] are within a range of 9.69% to 19.59% with a mean of 13.72% and a median of 12.82%

[17] Based on 25 year UK gilt rates in the month of contract start.

[B] Based on UK RPIX target inflation at the time of procurement.

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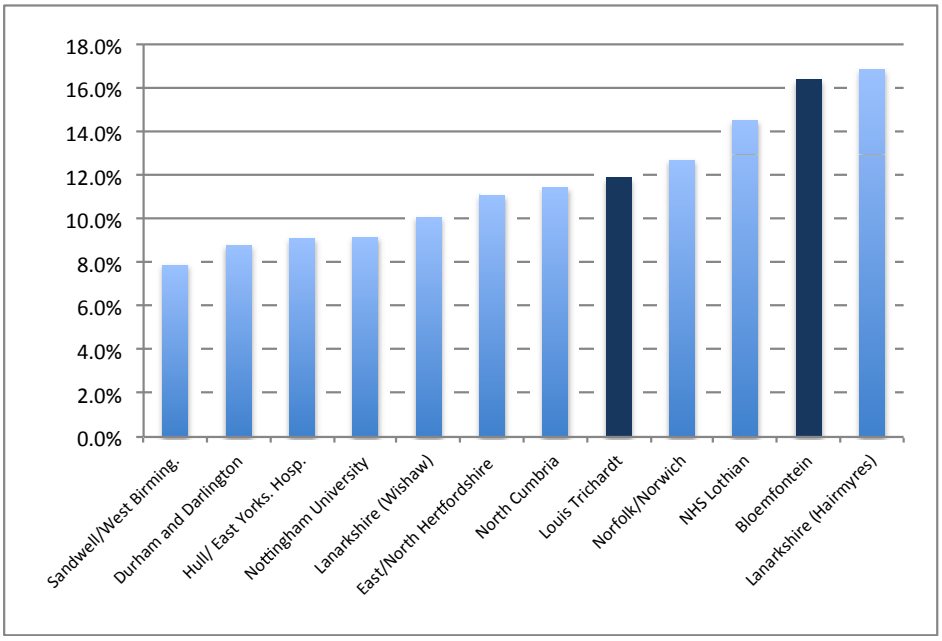
Table 7: Equity returns for the prison PPPs benchmarked against UK PFIs

Project	Contract start	Nominal Equity IRR	Real Equity IRR	25-year gilt at contract start	Implied equity premium
North Cumbria	Nov-97	17.8%	14.9%	6.3%	11.5%
Norfolk/Norwich	Jan-98	18.6%	15.8%	5.9%	12.7%
Durham and Darlington	Mar-98	14.5%	11.7%	5.7%	8.8%
Lanarkshire (Hairmyres)	Mar-98	22.6%	19.6%	5.7%	16.9%
Lanarkshire (Wishaw)	Jul-98	15.4%	12.6%	5.3%	10.1%
Nottingham University	May-99	14.8%	12.0%	5.6%	9.2%
NHS Lothian	Aug-98	19.7%	16.8%	5.2%	14.5%
East/North Hertfordshire	May-01	15.9%	13.0%	4.7%	11.1%
Hull/ East Yorks. Hosp.	May-01	13.9%	11.1%	4.7%	9.1%
Sandwell/West Birming.	Dec-02	12.4%	9.7%	4.5%	7.9%
Mean of comparators		16.6%	13.7%		11.2%
Median of comparators		15.6%	12.8%		10.6%
Bloemfontein	Mar-00	29.9%	23.2%		16.4%
Louis Trichardt	Aug-00	25.5%	18.6%		11.9%

Source: Dates and nominal IRRs based on Hellowell (2013); all else based on own calculations

With the equity premia for Bloemfontein and Louis Trichardt at 16.4% and 11.9% respectively, both project's equity returns fall within the range of comparative UK PFI equity premia at the time. While Louis Trichardt's equity premium is only 0.70% above the mean of comparators (11.9% - 11.2%), Bloemfontein's equity premium is closer to the upper end of the range. This is more clearly set out in Figure 3.

Figure 3: Implied equity premiums for RSA and UK institutions



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It is worth noting that while payments extend over the life of the project, debt is repaid over a much shorter period. The time between the debt maturity date and the end of the project is typically referred to as the tail. The tenor of debt (measured from the start of operations) was 13 years in the case of Bloemfontein and 18 years in the case of Louis Trichardt implying a tail of 12 years and 7 years respectively. It is during this period, that equity investors typically extract significant cash due to lower overall costs, which free up project cash flow. Despite the longer tail, the equity premium of Bloemfontein was 4.5% higher than the equity premium of Louis Trichardt.

The shorter tenor also resulted in the average gearing for Bloemfontein being significantly lower than for Louis Trichardt, which in theory should have decreased equity returns, all else being equal. Further analysis indicates that increasing the tenor of the Bloemfontein debt to 18 years while decreasing the leverage to 87:13 (in line with the financing terms of Louis Trichardt) would have increased the equity IRR from 29.9% to approximately 33.9%[19]. Arguably, this could also be used as a basis to compare the returns of the two projects. With both projects having been procured at approximately the same time, being of similar sizes and with contracts under similar terms it is therefore not clear how the excess equity return for the Bloemfontein prison could have been justified. Perhaps, it is a premium for the project being a first-of-its-kind with contract signed about 6 months prior to Louis Trichardt.

4.5.3 Benchmarking the Cost of Debt

In reviewing the cost of debt financing, we break down the all-in cost of debt into base rate and credit margin. The credit margin is set by lenders and is negotiated and priced according to the risk of the project. The base rates are market driven to the extent that interest rates are linked to such base rates. In the case of these two deals, both projects made use of fixed rate debt, which would have been set in line with market rates plus a swap margin. Complicating the benchmarking analysis of debt margins is the fact that all debt lent to South African PPPs has been financed by commercial lenders in private deals.

Ideally, we would have conducted a detailed analysis of the credit margins, but data on comparable South African credit margins at the time of procurement is not available. We do note that credit spreads for the two projects were quoted at 2.50% and 2.25% respectively. With margins being of similar magnitude while coming from different and competing lenders, it seems fair to assume that debt margins were priced competitively. To obtain an understanding of the magnitude, we compare the margins to the spread of the CPV Power bond which when first issued in March 2013, attracted a premium of approximately 5% over the South African government benchmark bond. This spread narrowed to approximately 3% after about one year of trading. Notably, this spread is significantly higher than the margins of 2.25% and 2.5% on the two South African prison PPPs. As such we conclude that there is an indication that the debt margins were priced competitively and limit further analysis to the base rate.

[19] Assuming a base availability payment of R215.7 per inmate in real April 2000 terms with 61.3% of the payment being indexed at CPI inflation bi-annually. CPI was assumed to be forecast at 6% at the time of the agreement, and adjusted for a K-factor of 0.623% increasing to 0.789% over 25 years. Debt is assumed to be amortised. Costs, as a balancing figure, were levelised over 25 years and increased at CPI inflation. Operating costs were assumed to be tax deductible and construction costs were assumed to amortised for tax purposes over a period of 25 years.

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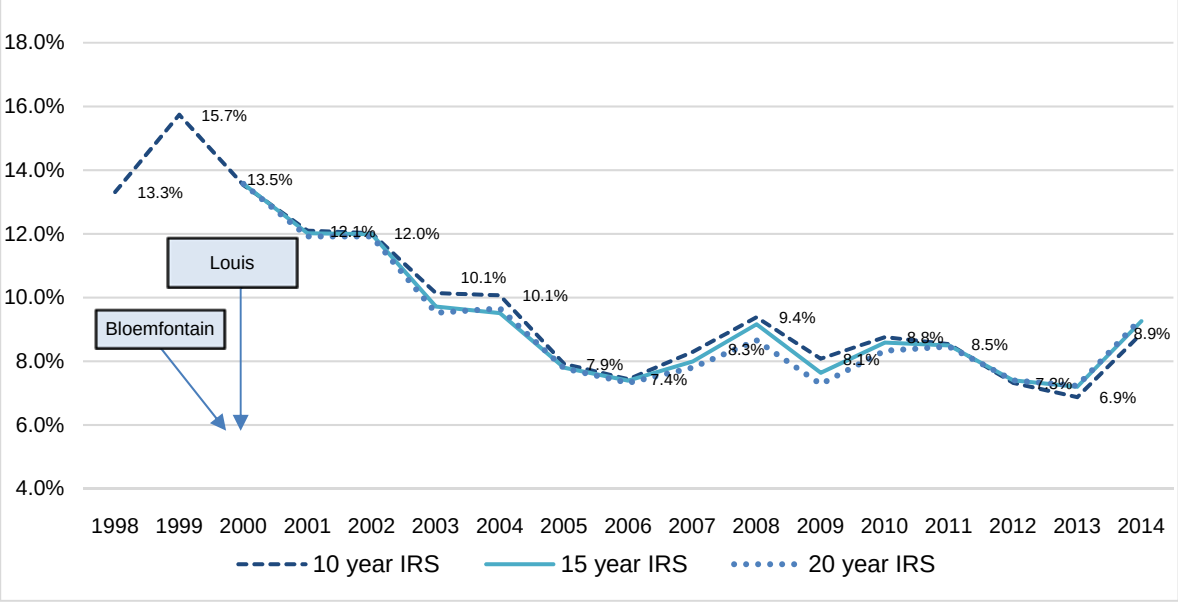
As the following analysis will show, South Africa was experiencing a period of high nominal and real interest rates at the time of procurement. The figure below presents the 10, 15 and 20-year interest swap rates as observed in the South African market in January of each year between 1998 and 2014. With both Bloemfontein and Louis Trichardt reaching financial close around the year 2000, both projects financed the deals and locked into interest rates at a time at which rates were close to a 16-year high as observed in the market. The closest available benchmark for the base rates are the 15-year market swap rates which were quoted at 14.09% and 13.21% respectively. We note this is slightly lower than the rates of 14.58% and 15% as referenced in the 2002 National Treasury review. It is not clear what could have caused the difference.

Figure 4: Interest rate swap curve at time of prison PPP procurement



Source: Thomson Reuters

The high swap rates seem to have been driven by high market rates as well as an expectation for market rates to remain high for a prolonged period, as indicated by the yield curve at the time of procurement. The figure below presents the yield curve at the contract date for both Bloemfontein and Louis Trichardt. Short-term yields at the time were between 11% and 12% while long-term yields were between 13% and 14%.

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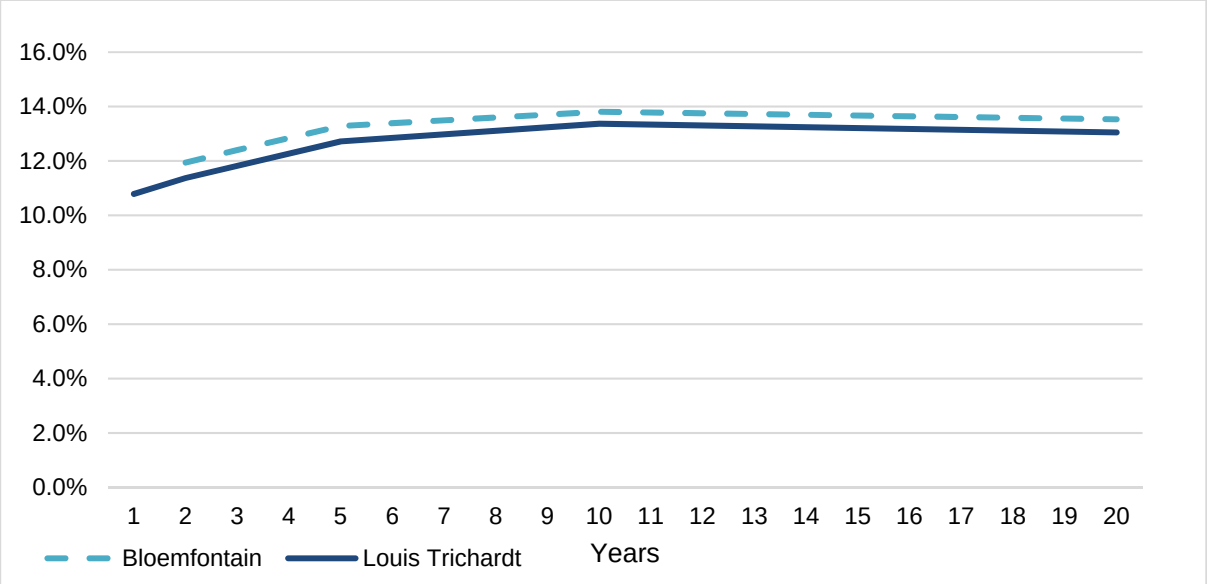
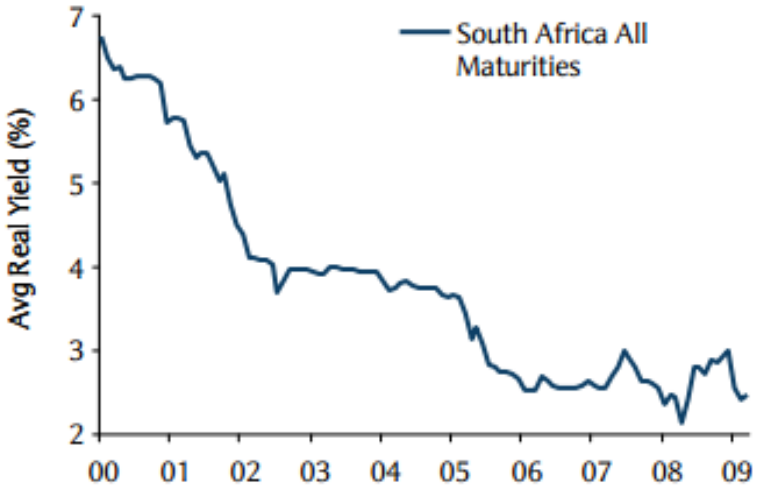
Figure 5: Yield curves at time of prison PPP procurement



Source: Thomson Reuters

The unusually high interest rates are further illustrated by the market implied real yields at the time of procurement. Figure 6 presents the real average yield of South African inflation linked bonds between March 2000 (when the first inflation linked bond was issued) and 2009. The real yield in 2000 was approximately 6.5% compared to a much lower average real yield over the period from 2000 to 2009 and an average real yield of 2.47% in 2009 (Barclays Capital, 2009).

Figure 6 Historic real yields on South African inflation linked bonds



Source: Barclays Capital (2009)

Crucially, both projects locked into fixed rate debt at a time when nominal and real market rates were unusually high.

4.5.4 Discussion of the project rate of return

The above analysis argued that both projects locked into fixed rate debt at a time when market rates were unusually high while the actual credit margins seemed reasonable. Based

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on an analysis of equity returns, Louis Trichardt seemed reasonably priced while the return for Bloemfontein was at the high end of the range. Crucially, both projects were financed using leveraged structures with high debt levels. With debt being cheaper than equity and also benefitting from a tax shield, this meant that the much lower cost of debt was the key driver behind the total cost of capital. Overall, Bloemfontein had a nominal project IRR of 18.27% while Louis Trichardt had a project IRR of 18.50% (National Treasury, 2003). By comparing this to the government benchmark rates at the time of procurement, we calculate that the projects came in at a 4.74% and 5.45% premium over the risk free rate. It could be argued that this premium represents the cost of privatisation and risk transfer to the private party.

Table 8: Prison PPPs project returns

Project	Bloemfontein	Louis Trichardt
Cost of Equity	29.90%	25.00%
Cost of debt (Pre-tax)	16.83%	17.50%
Cost of debt (After-tax)	12.12%	12.60%
Debt/Equity Ratio	12.36%	14.94%
Project IRR (A)	18.27%	18.50%
Government benchmark rate (B)	13.53%	13.05%
Premium (A-B)	4.74%	5.45%

Source: Cost of Equity, pre-tax Cost of Debt and Project IRR based on National Treasury (2003); gearing and post-tax cost of debt based on own calculations

4.5.5 Discussion of floating rates and inflation-linked debt

The 2003 National Treasury review suggests that high base interest rates at the time pushed up the long-term cost of the prisons to government. The review does however not make any suggestions as to how this could have been avoided (National Treasury, 2003).

In his discussion of the contracts, Farlam agrees with the points made by National Treasury but suggests that the high base interest rates could have been avoided in favour of floating interest rates or CPI-linked debt (Farlam, 2005). While Farlam's argument of using floating interest rates may have reduced the overall project costs in the hands of the private party, financiers and developers would unlikely have agreed on such financing terms as it would have exposed them to interest rate risk. In a typical PPP, project cash flows are ring-fenced and all costs and debt service have to be met from the project cash flows. In the case of a default, lenders cannot seek compensation from beyond the project's assets and cash flows, as debt finance tends to be of a non-recourse nature.

Floating interest rates create a risk that base interest rates will rise unexpectedly causing the project to run into cash flow problems. In extreme cases, the project may run into a scenario where interest rates increase so far, that project cash flows are no longer sufficient to meet the debt servicing costs. Assuming financiers and developers would nonetheless have agreed on using floating interest rates, this would unlikely have led to cost reduction for the public sector. The deal was negotiated at a time when base interest rates were high.

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Furthermore, market forecasts, as shown by the long-term swap curve as well as the yield curve at the time, were for interest rates to remain high.

As such, developers would have priced the deal under the assumption that interest rates would remain high for years to come. All else equal, the best estimate of interest rates at the time would have been the long term yield curve in which case pricing would have been similar under both floating and fixed rates. Arguably, some saving could have been achieved through the saving of the swap margin that would have been avoided by financing the project using floating rates. Offsetting this saving would have been higher credit margins and equity return requirements reflecting the increased risk around the uncertainty of interest rates. It may have been possible for the state to take on the risk of floating interest rates but it is submitted that this was unlikely at the time.

On a net basis, the use of floating rates would likely have outweighed the benefits of fixed rates while it is questionable if lenders would have agreed to such a structure in the first place. Assuming the project had still been financed using floating interest rates and without any increase in costs, a fall in base interest rates would only have reduced the costs in the hands of the private party and not the public sector, unless this was factored into the contract with the state.

If the public sector was prepared to structure payments on the basis of floating rates, then this may have enabled the use of floating rate debt. However, it is unlikely that the public sector would wish to take on interest rate risk, which may have led to budgetary constraints. As there was no way of predicting the future drop in interest rates at the time of agreement, the project would have been priced under the high base rates and, without a gain share, a drop in interest rates would have been to the benefit of the private party only.

While using floating rates may not have been an option, it is our view that the overall economic environment should still have been considered more carefully. At the time of procurement there was no way of knowing that interest rates would fall in future but such a scenario should at least have been considered. The analysis would have shown the impact on the project including the potential gains of a refinancing at more favourable conditions. Refinancing of debt is a common practise among PPPs with the contracts normally specifying terms for gain-shares to the public party. While the benefit of a gain-share can easily be identified in hindsight, it has to be acknowledged that gain-share clauses were not a common feature of PPPs in the early 2000s, even in developed markets.

It is our view that while using floating interest rates presents a risk to developers and financiers, inflation-linked debt can reduce risks by creating a natural hedge between interest and project revenues where such revenues escalate in line with inflation. For the two PPPs, linking interest rates to CPI inflation would have had the benefit of interest costs being hedged to the availability payments. To hedge the CPI exposure, bidders would likely have asked for a lower fixed and a higher indexed payment, which would have reduced the costs to the public sector under a scenario of low or falling inflation. Quantifying the impact of financing the deal using CPI linked debt is not straightforward. While there is clear benefit to the reduced risk from hedging interest rates through revenues, the overall impact is a function of various factors including the all in cost of debt. The scenario of financing the project with CPI linked debt is analysed in more detail in section 4.5.6.2.

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4.5.6 Estimated cost of debt financing under original terms

4.5.6.1 Assumptions

We estimate debt finance costs as at project start date and under original project terms, where available. A number of simplifying assumptions have had to be made where information published was insufficient. Specifically, no information on the repayment terms beyond what is summarised in Table 5 has been published for either project. As such it is unclear what repayment profiles have been applied to the senior debt. Therefore, the following analysis is subject to this limitation.

Repayment profiles for bank debt in a project finance deal can take various forms including annuity style amortisation (keeping total debt service fixed), straight-line payments (keeping principal repayments fixed), bullet repayments as well as sculpted repayments. Additionally, some deals make use of a cash sweep, which uses excess cash to repay some of the outstanding debt early, thereby changing the overall debt repayment profile. For the purposes of this analysis and in absence of any additional information, senior debt we assumed an annuity style amortisation profile.

Such a repayment profile assumes total debt payments consisting of principal and interest to be the same in each repayment period. During earlier debt service periods, interest payments make up the majority of total debt service while principal repayments are the balancing figure. Over time and as principal is paid down, the principal portion of the total payment increases and the interest portion declines while the overall payment remains constant.

4.5.6.2 Estimated costs at the time of agreement

The table below presents the total debt service for the Bloemfontein prison. In net present value terms, we calculate total debt service in 2001 for Bloemfontein as at R503 million[20] (an equivalent of R1 103 million in 2014 real terms). The net present value for the Louis Trichardt facility is estimated at R446 million[21] (an equivalent of R943 million in 2014 real terms). For Bloemfontein, the net present cost of interest only is calculated at R351 million[22] (an equivalent of R789 million in 2014 real terms). The interest cost for the Louis Trichardt facility is estimated at R367 million[23] (an equivalent of R801 million in 2014 real terms). Measured as a percentage of total project costs[24], interest on debt made up approximately 20.3% in the case of Bloemfontein and 20.1% in the case of Louis Trichardt.

[20] Discounted at 13.53% being the yield on the long-term (20 year) government benchmark bond at the time of agreement.
[21] Discounted at 13.05% being the yield on the long-term (20 year) government benchmark bond at the time of agreement.
[22] Discounted at 13.53% being the yield on the long-term (20 year) government benchmark bond at the time of agreement.
[23] Discounted at 13.05% being the yield on the long-term (20 year) government benchmark bond at the time of agreement.
[24] As measured by the NPV of payments, see section 4.2.

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Table 9: Prison PPP cost of debt service under original terms

Project	Bloemfontein	Louis Trichardt
	Rm	Rm
Total debt service	1,211	1,339
NPV of debt service (2001)	503	446
NPV of debt service (2014, real)	1,103	943
Total interest on debt	722	933
NPV of interest (2001)	351	367
NPV of interest (2014, real)	789	801
NPV of debt service as % of total cost	29.1%	24.5%
NPV of interest as % of total cost	20.3%	20.1%

Source: Own calculations

4.5.7 Estimated cost of debt financing using index linked debt

4.5.7.1 Assumptions

In a typical inflation linked-debt structure, drawdowns and interest are calculated on a real basis before an inflation-uplift is applied to both elements. Interest is calculated based on a real interest rate plus a credit margin. The real interest rate typically is fixed for the term in which case a swap margin would apply (but can be floating as well). The inflation uplift is applied to both interest and capital. In calculating the estimated cost of inflation-linked debt, a forecast CPI inflation rate of 6%[25] was assumed. The credit margin was assumed to be the same as under the original terms with 2.25% for Bloemfontein and 2.50% for Louis Trichardt.

The real interest rates were thereby calculated by deflating the swap rates at 6% forecast CPI inflation to arrive at implied real rates of 8.09% and 8.49% respectively. To check the reasonability of these rates, such can be compared to the real yield of a South African government benchmark bond. For the purposes of this benchmarking exercise, we use the R189 inflation linked government bond. The R189 was the first South African inflation linked government bond, issued in March 2000 and yielded approximately 6.5% real at the time of procurement (Barclays Capital, 2009). While, this is slightly lower than the calculated real interest rates, the benchmark rate presents a floating real rate. By basing the calculated rates on the fixed rates (as per published terms), this calculation takes into account an estimate of the swap margin, which would have had to be paid to fix real interest rates. Consequently, we have based the analysis on the calculated real rates but use the benchmark rate as a sensitivity factor.

4.5.7.2 Estimated costs at the time of agreement

The table below presents the estimated total debt service for the prisons assuming inflation-linked debt. The benefit to the public sector can be calculated by comparing the net present value (NPV) of debt service under inflation-linked debt to the NPV of debt service under the base case. For Bloemfontein this NPV in 2001 is calculated at R486 million[26] (an equivalent

[25] In line with the upper band of the South African target inflation band set at 3% to 6%.
[26] Discounted at 13.53% being the yield on the long-term (20 year) government benchmark bond at the time of agreement.

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of R1 065 million in 2014 real terms). The cost for the Louis Trichardt facility is estimated at R436 million[27] (an equivalent of R922 million in 2014 real terms).

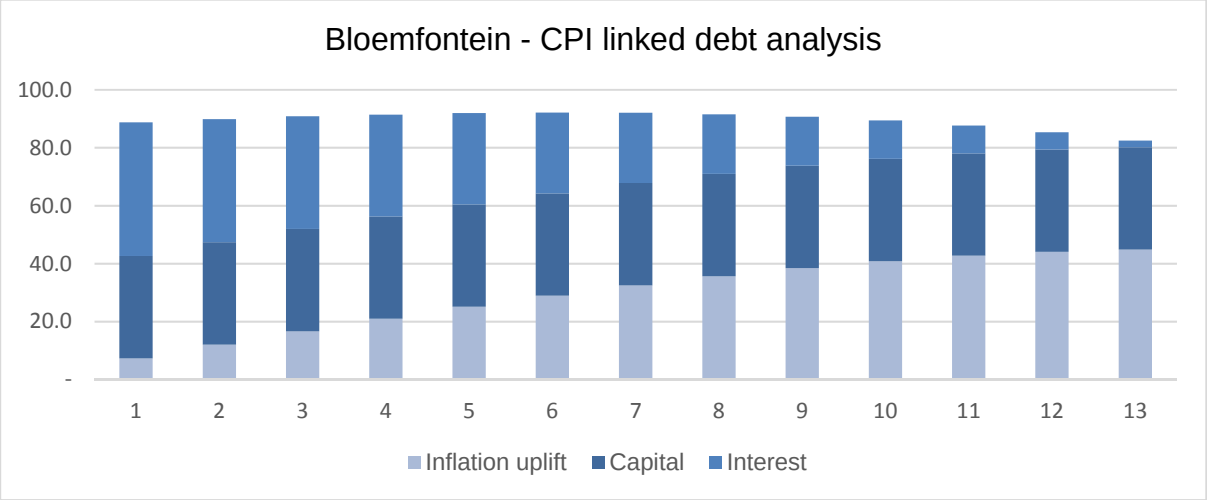
Table 10: Prison PPP cost of debt service using inflation linked debt

Project	Bloemfontein Rm	Louis Trichardt Rm
Total debt service	1,164	1,317
NPV of debt service (2001)	486	436
NPV of debt service (2014, real)	1,065	922
Savings compared to base case	17	10
Savings as a percentage of total costs	1.0%	0.6%

Source: Own calculations

As shown in the above analysis, moving to inflation linked debt would only have introduced marginal benefits of approximately R17 million and R10 million respectively (0.98% and 0.55% as a percentage of total project costs). This confirms that the total cost of debt would remain high using inflation linked debt, as base rates remain the key driver behind the total cost of financing. The following figures present the estimated debt service for inflation-linked debt under the assumptions outlined above.

Figure 7: Bloemfontein inflation linked debt profile:



Source: Own calculations

[27] Discounted at 13.05% being the yield on the long-term (20 year) government benchmark bond at the time of agreement.

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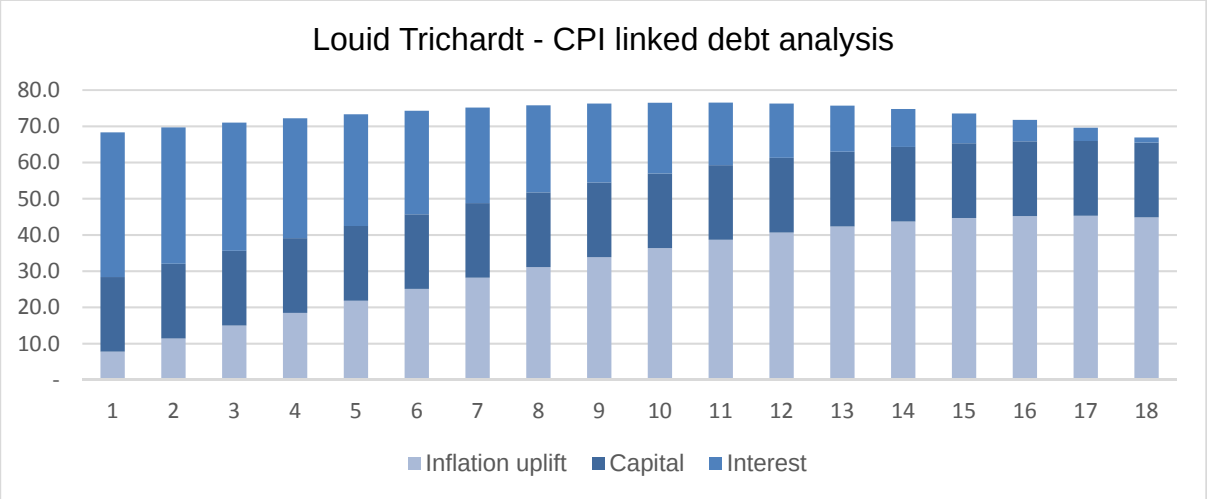
Figure 8: Louis Trichardt inflation linked debt profile



Source: Own calculations

4.5.7.3 Sensitivity analysis of the estimated costs at the time of agreement

As a sensitivity analysis, we repeat the previous analysis using a real interest rate of 6.5% based on the real yield of the R189 inflation linked government benchmark bond. Under the sensitivity, moving to inflation linked debt would have introduced benefits of approximately R54 million and R19 million respectively (3.1% and 3.2% as a percentage of total project costs) which is significantly higher than the benefits of R17 million and R10 million in the base case. Notably, this sensitivity analysis omits the cost of a swap margin, which would reduce the benefit somewhat.

4.5.8 Alternative financing options

In this section we consider whether some of the alternative financing solutions could have been beneficial for the two prison PPPs. Particularly, we discuss bond finance and a government contribution, as other options such as monoline insurance, development bank finance and government finance guarantees are either not applicable or would likely not have worked in a first-of-its-kind deal in a country which had no formal prior PPP experience at the time of procurement.

4.5.8.1 Bond finance

Bond finance presents an alternative to bank finance, which can often turn out to be cheaper but also tends to be less flexible. Research suggests that bond financing requires a well-developed and active capital market with sufficient appetite for the bond issue. A key disadvantage to bond issues is that the cost of debt is unknown until the finance has been raised. For highly leveraged projects, such as these two PPPs, this can present a challenge.

It can be argued that the size of the two projects was too small to reap any of the benefits of a bond issue. At the time of procurement, project bonds had not yet been tested in the South African market and this would have presented the first such bond issue. It is therefore questionable if bond finance could have worked for these projects. A private placement could have been considered, however due to lack of market data, it is not clear if there would have been sufficient appetite among investors.

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4.5.8.2 The case for a government contribution

Financing costs presented a significant portion of total project costs. The financing costs, as discussed, were driven by the high base rates at the time of procurement. Given the high base rates, which lead to a high cost of debt and equity without a gain share mechanism, we argue that a government contribution towards the construction costs of these projects could have significantly decreased costs.

Providing a government contribution towards the construction costs of a PPP reduces private funding requirements by the same amount and alters the risk profile of projects. As private funding tends to be more expensive than government funding (the cost of public sector funding is measured at the risk-free rate), providing a contribution can significantly reduce overall project costs. How would this margin impact on costs? We use an extreme example to indicate the long-term impact of spreads or margins. We will assume for the purposes of this illustration that the total cost of R491m and R406m is borrowed and the principal and interest is payable as a bullet payment in 25 years time.

Table 11: Future value of capital and rolled-up interest

Cost (Rm)	491	406
Risk-free rate (government bond yield)	14.58%	15.00%
Margin	2.25%	2.50%
Borrowing rate	16.83%	17.50%
Future value of debt and interest at (Rf)	14,750.3	13,365.1
Future value of debt and interest at (Rf+ margin)	23,985.1	22,880.9

The cost would be effectively amortised over a 25 years or a shorter period but the above analysis indicates the potential impact on total cost of a relatively competitive margin of 2.25-2.5% at the time if the cost was not amortised. The cost would be 1.63 to 1.7 times the cost if funded directly with government debt. The effective amortisation of the debt would reduce this cost difference but the above analysis serves to indicate the potential impact on the total cost by undertaking private borrowings to finance the projects.

However, the disadvantage of a contribution is that it may decrease risk transfer as it reduces the private party's investment in the project. In certain circumstances, the reduction in risk transfer could result in a decrease in value for money, which should be considered carefully in evaluating the option.

In South Africa, it is common for the public sector to provide a contribution to PPP projects, especially on projects with large capital outlays as evidenced by the 5 out of the 11 South African DFBOT PPPs which have received contributions ranging from 10% to 87% of capital value (PPP Unit, 2013).

4.6 Conclusions in respect to financing options

The 2002 National Treasury review suggested that the operating costs of the PPP prisons (i.e. operating cost excluding financing) were relatively competitive but argued that total costs were nonetheless high due to specifications being imported from UK PPP prisons. In our analysis, we compared the total cost of the prisons to a number of UK PPP prisons and

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found that the cost per inmate was approximately six times less expensive than the cost per inmate for UK prisons built around the same time.

Some have criticised the financing costs and suggested that these were a key driver behind the overall costs of the prisons. While our analysis confirmed that the financing costs of the PPP prisons were high, this seems to have largely been driven by unfavourable market conditions at the time of procurement, and not by excessive returns. Once we isolated the impact of high base interest rates at the time of procurement, we found, that financing costs seemed reasonably priced.

While alternative funding solutions, such as inflation linked debt or bond finance, may either not have been possible or not have been able to bring significant cost savings, there is a strong argument that the Department of Correctional Services should have explored other financing structures more closely and thereby should also have considered the option of a government contribution. While we acknowledge that the impact on risk transfer and value for money would also have had to be considered, our analysis showed that a government contribution could have resulted in significant cost savings.

4.7 Lessons learned

A key issue with the two deals was the inflexibility of contract terms, which locked the public sector into payments driven by the high initial costs. Failure to consider and include clauses for gain-share mechanisms meant that there is no upside or claw back mechanism for the public sector. However, both prisons were procured at a time when gain share mechanisms were not common practise among PPPs, even in developed PPP markets.

While we have not discussed or examined the output specifications as part of this paper, the review done by National Treasury suggests that the specifications were set unnecessarily high. Thus, the Department of Correctional Services should possibly have considered a more flexible and cheaper prison design. A more flexible and structured financing solution that included a government contribution would have reduced the total costs of the prisons.

4.8 The future of PPP prisons in South Africa

According to du Plessis, the future for PPP prisons in South Africa does not look bright. Following the procurement and building of the first two PPP prisons in Louis Trichardt and Bloemfontein, former president Thabo Mbeki, in his 2002 State of the Nation Address, announced the building of the next four new prisons in Nigel, Klerksdorp, Leeuwkop and Kimberley, with 3,000 bed spaces each.

The announcement came a few months after the completion of the first two prison PPPs, but there was no indication of whether these new facilities would be state-controlled or be run as PPPs. Only the Kimberly prison was built as a public sector initiative financed and run by the state, and not as a PPP. In 2006, Mbeki announced the building of four more prisons in Paarl, Port Shepstone, East London and Polokwane. None of these prisons have been built to date.

By 2008, the Department of Correctional Services decided to go ahead with four different prisons, all of which were in new locations being Klerksdorp, East London, Nigel and Paarl. These prisons were to be procured as PPPs and four consortiums were shortlisted. In November 2011, Correctional Services Minister Mapisa-Nqakula called a press conference

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to announce that the procurement of the new PPP prisons was cancelled because the tender requirements had changed to such an extent that bids fell short of the new criteria. It was estimated that each consortium had spent R20 million on their bids which were not recoverable (du Plessis, 2012).

While the unrecoverable bid costs most certainly were a large cost to the consortia, the actual cost of cancelling the projects may have had a more significant impact causing a lack of credibility for the public sector and the South African PPP framework. Bidders already have to bear significant risks in bidding for a contract and may choose not to tender for future projects if there is a lack of credibility and risk of procurements being cancelled.

5. Conclusions and summary

Given the highly levered nature of a typical PPP, debt plays a key role in the financing of PPPs. We therefore focussed on debt financing solutions and discussed the various options available. Comparing this to the financing solutions used on South African projects, we found that the South African market is heavily reliant on bank debt. While the South African PPP framework is well developed, the number of projects procured under the framework has been too low for the market to properly develop a deep available PPP financing market. Li found that such an available financial market was one of the top three factors required for the development of successful PPPs in the UK (Li, 2005). The lack of alternative funding solutions for South African PPPs may be hindering the development of future projects and driving up costs.

While the recent REIPPPP cannot technically be classified as a South African PPP, the programme shared numerous similarities with PPPs. The REIPPPP was a positive development for the financing market as it caused an increase in interest among institutional investors and development banks, both local and international. The increase in involvement by such parties may be signalling that investors are slowly opening up to South African infrastructure project finance deals. The issue of the first investment grade infrastructure project bond, in particular, is a strong indication that the South African infrastructure project finance market may be developing and readying itself for alternative financing solutions.

In this study, we assessed the various criticisms of the PPP prisons but found, that the total cost (on a per inmate basis) was significantly lower than the cost of UK PPP prisons at the time, although such comparisons are subject to limitations. We also found that financing costs, which received significant criticism, were driven by unfavourable market conditions at the time. Once we isolated the unusually high market interest rates, we found that financing costs for the prisons seemed to have been priced competitively. It is submitted that a government contribution could have brought significant savings to the public sector. We do however note that the prisons were procured before South African Treasury Regulations for PPPs were put in place. Currently, South Africa requires the Treasury to approve PPPs proposals in a four stage process before the signing of a contract (Irwin, 2010). A feasibility study is conducted as part of the approvals process which aims to assess costs and value for money under various financing options (PPP Unit, 2004). It should be noted that while this process, in theory, should result in more optimally structured deals, the final cost is still heavily impacted by the state and availability of suitable and effective financing solutions.

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Hence, a deep and available financial market should be one of the key objectives for policy makers and industry participants.

Recommendations for further research

The success of the Renewable Energy Independent Power Producer (REIPPP) programme, which has resulted in the investment of over R100 billion in three years up to 2010, stands in stark contrast to the lack of the success of the PPP prisons. It would be relevant to research the factors that led to the success of the REIPPP programme, undertake a comprehensive comparative analysis in relation to the PPP prisons and derive policies and the management strategies that may be applied in other PPP projects.

This study employed data that was publicly available and it would be useful to use a more extensive data set in order to undertake a more precise analysis of the costs of the PPP prisons in relation to the costs of publicly operated prisons. In particular, the effective cost subsidy of overcrowding in the current public prisons should be taken into account in making comparisons.

This study focused on a limited comparative analysis of PPP prisons to the UK experience. This comparative analysis can be extended to other countries such as the USA, which has a long experience with privately owned and operated prisons.

Conclusion

This study provides equity benchmark returns for early South African PPP projects by comparing such project returns to both local and international comparators. It provides a response to some of the critics of the South African prison PPPs and expands on areas, which the 2002 National Treasury review did not review or evaluate. Furthermore, this study calculates the total cost of the South African prison PPPs and benchmarks this against a set of international comparators. Subject to limitations, the conclusions of this study indicate that costs and returns implicit within the PPP prisons were not unreasonable in relation to the UK PPP projects, and simply reflect high market interest rates at the time. Spreads and equity premiums appeared to be reasonable, particularly for the Louis Trichardt prison. Whilst, the objective of the study was not to compare costs and returns in relation to the public prisons, the lower costs of the public prisons may also reflect the impact of overcrowding on the relative costs per inmate. Whilst PPP prisons may not be optimum in terms of public policy, an analysis of the costs and returns of such prisons should lead to a more accurate assessment of PPP projects in South Africa.

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