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Public Private Partnerships: A licence to print money … or value for money?

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Abstract

It is often considered that a Public Private Partnership (PPP) is a licence to print money for the private entity and that the state receives a price which does reflect the value of the underlying public asset.

This paper explores key concepts that underpin and define the nature of PPPs and how such partnerships have emerged and evolved as a means of project funding. The relationship between the underlying asset and the ownership of the derived benefit from the consumption of the public asset is explored to illustrate how the same asset can represent different values.

A PPP results in a legally binding contractual agreement between autonomous bodies, private consortia and funding entities to establish special purpose vehicles (SPV) in order to deliver public services to society. This paper addresses the definitions of key terms that are used and introduces a model to illustrate the different meaning of value to each of the stakeholders.

The author raises a number of questions in order to provoke an informed debate about what is the value of a PPP. Often, the perception is that the state sells off public assets at a fraction of the real value of that asset. The author reviews the different methodologies for evaluating an asset and questions whether these proxy models are applied appropriately?

The paper critiques the use of certain decision-making tools such as Cost-Benefit Analysis (CBA), Net Present Value (NPV) and Discounted Cash Flow (DCF) in determining the value of a public asset. The assumptions and criteria associated with these tools are presented and reviewed with respect to the life of a public asset such as a PPP project which may be 25–30 years or even older.

The author briefly reviews the different perspectives of the different stakeholders and introduces the concept of the ‘Polygon of perceived value model of a public asset (P)’. This proposed model is to illustrate that the value of the same asset is different depending on the perspective of the various stakeholders.

The author is seeking to develop a robust financial model which can be applied in a European context. This initial paper is the beginning of both qualitative and quantitative research into different areas such as the current PPP guidelines; financial models and regulations for PPPs that are applied in the different EU member states.

Keywords: Public Private Partnerships; Value for Money

1 Introduction

The first objective in this initial research paper is to clarify what the value of a public asset such as a PPP infrastructure is? In order to address this question, the author will present fundamental definitions. What is a PPP? What is an asset? What is value? The second objective is to clearly explain what value means from the perspectives of the different stakeholders. To illustrate this a graphic model is used to show what 'value' means to each stakeholder. The third objective is to review some of the current methodologies that are applied in the decision making with respect to PPPs and different evaluation techniques. The fourth object is to critique the use of some of techniques and tools. Finally, the author will review the concept of Value for Money (VfM) for a PPP and present his conclusion to the question: Are PPPs a licence to print money?

To put the question into the context of current thinking, the author has reviewed the following literature. Grimsey and Lewis (2005) ask the question do PPPs offer value for money and they seek to provoke debate between academia and practitioners. The author wishes to take this debate further by illustrating that value means different things to different stakeholders. This is aside from the fact that there are clearly defined accounting rules and economic definitions of what value is. It is more a question as to where the asset appears on the balance sheet: on the asset side (private consortium) or the liabilities side (the public agency)?

In approaching this topic of what is 'value', a number of fundamental definitions and concepts are presented such as what is a PPP; what is an asset; what does ownership mean; how is value defined and measured? The different evaluation methodologies are reviewed such as accounting, market, societal and personal value.

The concept of the 'Polygon of perceived value of a public asset' is presented as a way of illustrating how the same asset can represent a different value to the various stakeholders.

The author introduces the different evaluation methodologies for the appraisal of an asset. The assumptions surrounding the use of these analytical tools are reviewed, such as Cost–Benefit Analysis (CBA – economic analysis), Net Present Value (NPV – financial analysis) and *Capital Asset Pricing Model* (CAPM – risk analysis).

The use of risk as a measurement to evaluate an asset is reviewed as a possible proxy model, however, the author points to the fact that the use of these risk optimisation models, such as the Gordon Growth and CAPM, require specific criteria for them to be applied. Shaoul (2005) presents a robust argument as to why the use of these tools is flawed on the basis that the use of CBA and NPV are based on specific criteria such as fixed cash flows, known interest rates, and a short time frame (3–5 years). Also, the risk optimisation models (CAPM and Gordon) originate from portfolio theory and like NPV and Discounted Cash Flow (DCF), these tools are based on similar criteria. A PPP project can be considered to have an asset life of 25–30 years and in some cases may even be multi-generational, up to 99 years. Kunsch et al. (2008) propose that a multi-generational discount rate be applied when evaluating long-term projects as opposed to

a single rate. Liu (2008) argues that despite various proposed models that are used, none are truly robust and no one size fits all.

Buehler et al. (2008) trace the evolution of risk management and portfolio theory in their article, which illustrates how evaluation models have changed but risk is always here to stay. Other theorists consider the value of PPPs to include the whole-time cost of the project. The 'Living Building Concept' (see http://www.livingbuildingconcept.nl) develops this theory further and proposes that the total component cost of a building should be included over the entire life of the asset. Bing Li et al. (2001) present their three-tiered model as part of preliminary results of a Ph.D. They argue that a model for VfM based on qualitative research and surveys should account for project efficiency, sustainability and multi-benefit consideration.

Grimsey and Lewis (2005) have reviewed whether completed PPP projects in over 20 different countries delivered VfM and concluded that yes, PPPs did deliver VfM; however, the amount of value was not a specific percentage figure but more a range or spread.

2 What is a PPP?

PPPs are defined in many different ways depending on which country and/or local authority is using a PPP to deliver a project.

According to the Guidelines of the National Department for the Irish Government (see http://www.ppp.gov.ie), a PPP is an arrangement between the public and private sectors (consistent with a broad range of possible partnership structures) with clear agreement on shared objectives for the delivery of public infrastructure and/or public services by the private sector that would otherwise have been provided through traditional public sector procurement.

A particular arrangement or project may constitute a PPP where the following key characteristics are present:

- shared responsibility for the provision of the infrastructure or services with a significant level of risk being taken by the private sector, for example, in infrastructure projects, linking design and construction with one or all of the finance, operate and maintain elements
- long-term commitment by the public sector to the provision of quality public services to consumers through contractual arrangements with private sector operators
- better value for money and optimal allocation of risk, for example, by exploiting private sector competencies (managerial, technical, financial and innovation) over the project's lifetime and by promoting the cross-transfer of skills between the public and private partners.

(National Development Finance Agency; see http://www.ndfa.ie)

PPP refers to the agreement between a public body and a private entity in order to deliver a public service in an economic, efficient and effective manner to the public user. The term is believed to have originated from the USA, however the concept has its origins back to seventeenth-century Europe where individuals were granted concessions to operate canals in France and roads in the United Kingdom (UK). The concept dates even further back in other countries such as Asia and Africa (Grimsey and Lewis 2005). PPPs evolved from a policy implemented by the Conservative government in the UK in 1992 called the Private Finance Initiative (PFI). The succeeding Labour government developed the concept in order to deliver public services and goods. The view adopted was that by combining the perceived experience and expertise of the private sector in its ability to deliver projects successfully to satisfy a public need, the public would receive better value at a lower cost (Yescombe 2007).

The common practice is to establish a special purpose vehicle (SPV) which will be a legal, corporate entity in its own right. Usually the private consortium establishes a SPV to create, operate, manage and maintain the platform for delivery of the public service. The ownership of the SPV is usually a combination of any or all of the partners, such as the public agency, the project promoters, the private consortium and the financing partner. The objective of the SPV is either to create an asset to deliver a public service or to transfer an existing asset in order to deliver a public service. The intention is that the public receives what is termed, and measured as VfM, i.e. the tax-payer receives better value for their money.

PPPs can be a concession or a licence granted by the state to a private entity to operate an asset or deliver a service for the benefit of the members the public. The theory implies that this type of arrangement is a ‘win-win-win’ for the government, the public and the private consortium. PPP agreements enable the use of public assets by the SPV to deliver better VfM.

Traditionally, a local authority received its funding through budget allocation and revenue from local charges for services. The public body identified a ‘need’ for a service such as healthcare or an infrastructure asset such as a bridge. The state fulfilled the need through normal procurement methods, i.e. public tender for best price. If the authority could not finance the creation of the public asset within its own budget, it could obtain funding through government borrowings. EU member states are restricted under the terms of the Maastricht Treaty (1992) in relation to the cap on borrowings (3% GDP and/or a debt to GDP ratio of 40%). There is an opinion that this is why PPP agreements are used; in order to develop infrastructure assets off-balance sheet.

Figure 1 illustrates the different approaches between the traditional procurement process and the use of a PPP.

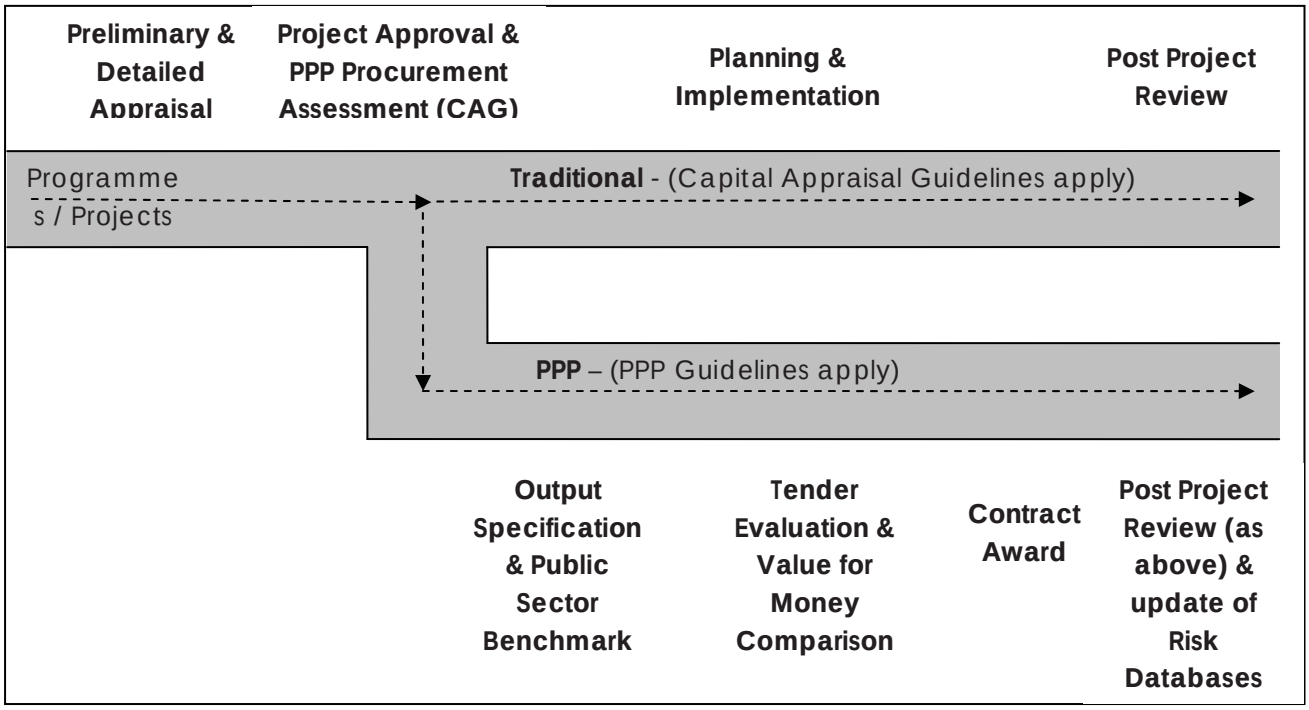

Figure 1 Traditional and PPP Procurement Stages – Summary
Source Assessment of Projects for Procurement as Public Private Partnership November 2006

PPPs are another method of procuring the same public asset in a more cost efficient and effective manner. However Shaoul (2005) uses the case study of the National Health Service in the UK to illustrate the flaws in the practice of using PPPs as opposed to the theory.

Keymer (2006) considers that PPPs bring public and private sectors together in long term relationship for mutual benefit. The author argues that PPPs bring together many different stakeholders in a complex and often dysfunctional relationship. However, the reason PPPs receive bad press is due to budget over-runs and lengthy delays that are a result of project management, implementation and transfer.

The term PPP refers to the actual partnership, not necessarily the public asset. A 'partnership' can take many forms, as Linder (1999) describes in his essay. He describes six forms ranging from a tool to a technique in order to reshape and restructure the delivery of public service. He is interested in PPP as a strategy and also as a political symbol and a policy tool.

Yescombe (2007) describes project-based PPPs as having four characteristics:

1. a long term contract between a public sector body and a private party;
2. for the design, construction, financing and operation of public infrastructure (the facility) by the private sector party;

3. with payments over the life of the PPP contract to the private sector party for the use of the facility making the public sector party or the general public users of the facility;
4. with the facility remaining in public sector ownership or reverting back to the public sector ownership at the end of the contract.

He addresses the complex subject of PPP, specifically project PPPs rather than services, in a structured approach from different perspectives.

Grimsey and Lewis (2005) state that there is no single definition for a PPP. It is the nature of the project and the culture of the local authority among many other factors that will define what form a PPP will take. However the author believes that part of the complexity of defining what a PPP is results from the misinterpretation of the fundamental definitions.

A PPP agreement is in the form of a contract which defines the roles, responsibilities, risks and rewards for each of the stakeholders. There are many forms of PPPs and the types of agreements will vary from country to country. A PPP agreement may use existing public assets to deliver a public service. A PPP agreement may create a new public asset to deliver the public service. A PPP may develop an existing public asset to extract the maximum benefit. But the PPP is just the 'agreement' or contract between the stakeholders such as a company, a bank, consumer and the government. It enables the consumption of an asset for the benefit of the end user. There are many variations of the type of contract.

The different types of agreements include Design, Build, Operate (DBO), Design, Build, Operate, Finance (DBOF), Design, Build, Operate, Finance, Maintain (DBOFM), Build, Operate, Own (BOO); Build, Operate and Transfer (BOT). Each type varies within its form and structure depending on which country it is established in and specifically who the individual stakeholders that make up the partnership are.

The distinction between the different types of PPP lies in the ownership of the asset and the amount of transfer of risk and responsibility from the public to the private party. The difference between a DBO and the DBOF usually is that the ownership of the asset remains with the public body. The other difference between types of PPP is how the private party is rewarded for accepting the transfer of risk. Either a service fee can be paid based on usage or a licence can be granted.

In the case of the BOO and BOT, the difference lies in when the ownership is passed back to the public authority and how the private consortium is reimbursed. If it is a Design, Bid and Constrict project as executed by the public agency, it is a question of input specification compared to a Design, Build, Operate and Maintain, which is dependent on outputs defined within a long-term service agreement.

This is where the cloudiness of how to evaluate the same asset occurs. It depends upon whose balance sheet the asset resides on and which side of the balance the asset resides. Is it a cost/liability (public) or a revenue generating (private) asset?

3 What is an asset?

The *Concise Oxford English Dictionary* (2003) defines an asset as the following:

> 1. a useful or valuable thing or person 2. property owned by a person or a company regarded as having value and being available to meet debts, commitments or legacies.

In financial accounting and reporting terms, Schuetze (1993) states that the Financial Accounting Standards Board (FASB) defined an asset as having three characteristics:

> (a) it [an asset] embodies a probable future benefit that involves a capacity, singly or in combination with other assets, to contribute directly or indirectly to future net cash inflows,
> (b) a particular entity can obtain the benefit and control others' access to it, and
> (c) the transaction or other event giving rise to the entity's right to or control of the benefit has already occurred.

So an asset provides a present or future benefit to someone for something, somehow, somewhere, sometime. In agreement with Schuetze, the FASB's definition appears to be vague and open ended and hardly even meets the accounting terms of exchangeability or comparability. According to Wikipedia, an asset has three essential characteristics but it goes further and defines an asset as the sum of the liabilities plus the shareholders equity on a company's balance sheet. A simple definition is that an asset provides a benefit and increases the wealth of a nation or maximises the shareholder profits. The ownership of the asset will determine who receives the benefit.

The online encyclopedia, Wikipedia, (see http://en.wikipedia.org/wiki) states that:

Ownership is the state or fact of exclusive rights and control over property, which may be an object, land/real estate, intellectual property (arguably) or some other kind of property. It is embodied in an ownership right also referred to as title.

A public asset is owned by the state on behalf of community for the collective benefit of the public. The public derives benefits from the consumption of public assets. Traditionally, an asset is measured in monetary terms. The value of this figure is a measure of the worth of the asset. An asset is consumed over time by deriving benefits from it. In a company's accounts, this decay of the value of an asset is shown as depreciation of the asset over an agreed time period according to financial reporting standards (FRS) or generally accepted accounting principles (GAAP).

But as can be seen, it is the transfer of ownership and subsequently the benefits that determine what the value of an asset is and, most importantly, what value to whom.

4 What is 'value'?

Again, the *Concise Oxford English Dictionary* (2003) defines value as:

> 1. the regard that something that is held to deserve; importance or worth; material or monetary worth. The worth of something compared to its price, at €2.00 it is good value. 2. values principles or standards or behaviour 3. numerical amount denoted by an algebraic term, a magnitude, a quantity or number etc.

In identifying the value of any asset; it is measured in accounting and economic terms which is clearly possible with respect to tangible assets. In today's world, how does one measure the benefits accrued to the public of an intangible public asset such as a park? How does one place a 'fair value' on the benefits of intangible assets?

Traditionally assets are considered to be real, physical entities such as plant, equipment buildings, etc. however there are also intangible assets such as licences, goodwill, reputation, copyrights and patents.

Reilly and Schweihs (1998) state that there are assets which are both tangible and intangible and that an intangible asset has the following defined characteristics.

1. Specific identification and recognizable description
2. It should have a legal existence and be protected legally
3. It should have the right of private ownership in whole or part
4. There is tangible evidence or manifestation that it exits
5. Evidence that it came into at a specific time
6. It will decay at a specific date.

A PPP agreement meets all of the above criteria.

According to FRS No. 3, the 'Fair value is the amount for which an asset could be exchanged, or a liability settled, between knowledgeable, willing parties in an arm's length transaction. Where the fair value of the asset is not able to be reliably determined using market-based evidence, depreciated replacement cost is considered to be the most appropriated basis for determination of value.' The debate about what 'fair' actually means can be difficult and challenging.

It is important to note that the value of an asset is not necessarily the cost of the creation of the asset, or the sum of the total quantitative benefits derived from the consumption of the asset, both tangible and intangible. There are specific tools, techniques, methodologies guidelines and standards as to how to value an asset. It is often the assumptions and application of these clearly defined methodologies that result in an asset been assigned the wrong value. What is important in starting the evaluation of any asset is to determine: What is the purpose and who is the audience? It is accepted that the value of an asset is measured by applying three separate methodologies – market, cost and income – under a defined set of accounting and financial reporting standards (Reilly and Schweihs 1998).

There is the accounting value or 'book' value of an asset and then there is the market value of an asset. There is also the economic value of an asset. Wikipedia describes the economic value of something as how much a desired object or condition is worth relative to other objects or conditions. The internet search engine, Google, defines economics as the study of how people use limited resources in an attempt to satisfy unlimited wants (http://investor.cisco.com/glossary.cfm). The economist uses another measure called the 'economic added value' (EAV) of an asset. This is how much additional value is added by an asset.

The measure of money has been studied down through time, but the evolution of 'value' theory has its origins in Adam Smith's An Inquiry into the Nature and Causes of the Wealth of a Nation (1776). Since then, a roll call of economists and experts have contributed to the sea of knowledge, from Malthus to Marshall (Principles of Economics 1890), from Keynes (The General Theory of Employment, Interest and Money 1936) to Graham and Dodd (Security Analysis 1934), from Bonbright (Valuation of Property 1937) to Damodaran (Investment Valuation 2002); from Lintner and Scholes (The Gordon Growth Model and CAPM) to Farma and French (A Random Walk). Often it is asked whether the study of value is an art or science. It may not be an exact science. However, there are accepted and agreed standards on the measurement of an asset. It is agreed that the term 'value' can have different meanings and associated methods of measurement.

Today, due to the climate change and the effects of globalisation on the environment, the definition of value has taken on other meanings. Now the societal value of an asset is required to be measured along with the personal value of a public asset. However these are not standard evaluation models as defined by the GAAP or FRS rules. To society, an asset is of value because it brings merit benefits to be consumed for the public good such as parks and/or art galleries (externalities and merit goods). The value of an asset to society is often determined by society's willingness to pay for admission into an art gallery. Economists have determined that some assets have merit benefits which do not produce an income but are a cost; however, they do provide a qualitative benefit to society. The techniques used to measure these merit benefits are very subjective due to the individual decision makers' personal preferences and uses of applying accepted qualitative techniques such as multi-criteria decision analysis (MCDA).

To the individual, personal value according to Wikipedia, evolves from circumstances with the external world and can change over time. An individual may place a different value of having a crèche located beside where they live compared to a person who may place a higher value on having a walk-in clinic in the vicinity. Personal values are the hardest to evaluate and often are subjective.

The author wishes to suggests the term, 'green value' would reflect the impact of globalisation and carbon emissions on the world economies. Under the Kyoto Agreement (1997), the signature countries have agreed to introduce a form of carbon tax in order to reduce carbon emissions. The measurement of this is in terms of a monetary value. Green value will reflect the concept of sustainable building including the whole life time component costing of a project.

The value of an asset can be measured from four or five different viewpoints as mentioned above. This does not mean that value equals benefits which equals costs even though it is the same asset. It is the treatment of this same asset on the balance sheet of the individual stakeholders that will determine its value and not the tool used to decide whether to proceed with a project.

So in the case of a public park, school or hospital, value is not measured in terms of money or profit but the maximisation of merit benefits which are actually a cost.

A significant factor that needs to be considered is the time value of the asset over the whole lifetime of the underlying asset. The objective of the author here is to clearly establish how the value of a public asset is perceived by different stakeholders.

In Figure 2, the value of an asset in accounting terms is shown over the whole lifetime of the asset from the identification of the need to the eventual decay of the asset until it reaches its residual value. What can be seen is that the value of the asset changes over time; it may increase and decay but the value is always greater than zero. The area under the curve is the total measure of value of the asset.

The value of the asset varies depending on which stakeholder is measuring it. For example the 'book value' of a company is measured by totalling the company's assets and deducting the liabilities and shareholders' equity. The 'market value' is calculated by determining the demand price for a single share and multiplying it by the total number of shares. This could be greater than the book value. The difference between the book value and the market value often represents the value of the intangible assets of a company such as brand, goodwill or reputation.

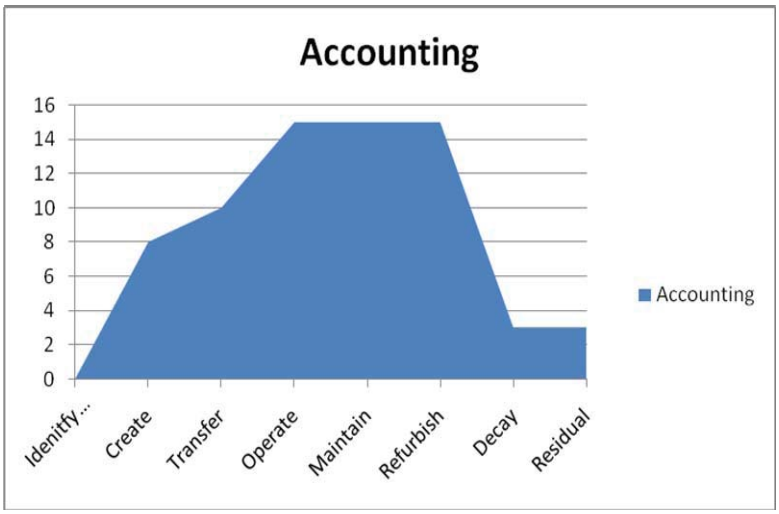

Figure 2 The value of an asset

So the same asset may have different values depending on which stakeholder and which technique is used to evaluate the asset as is illustrated in Figure 3. The public asset may be worth more from an economic perspective to the overall wealth of a nation compared to the book value of the asset, i.e. the cost associated with building a toll bridge is normally the value placed on such a class of asset but the value to the company who

designed, built, operated and maintained the toll bridge may be substantially more because of the long-term earnings from the tolls collected.

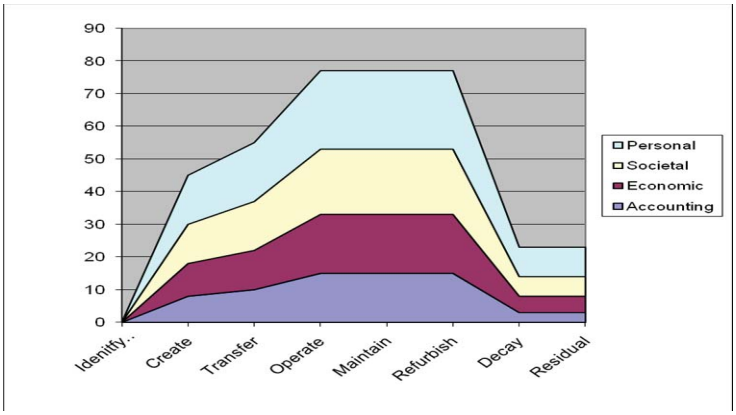

Figure 3 Value depends on the methodology applied by the stakeholder

5 The polygon of perceived value of a public asset

Each stakeholder uses their own methodology and tools to evaluate an asset. It is the same asset but it represents a different value to each stakeholder. In the example of a simple PPP agreement between a government, a public consumer, a private company and a lending bank, the value of a public asset is illustrated in Figure 4.

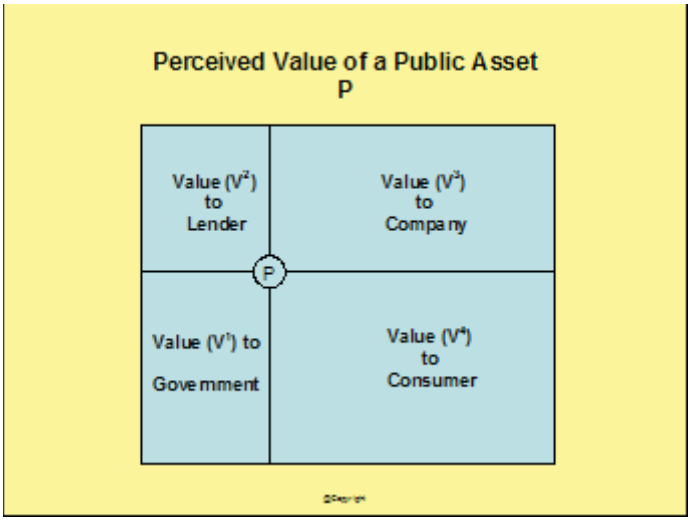

Figure 4 Perceived value of a public asset P

Figure 4 illustrates that value of the same public asset, P, which has different values to each of the different stakeholders and is calculated differently. The amount of each Value (V^i) represents the perceived value to each stakeholder. The area of each V^i is different depending on the evaluation methodology applied. If the number of stakeholders changes, so does the number of sides of the polygon as represented in Figure 5.

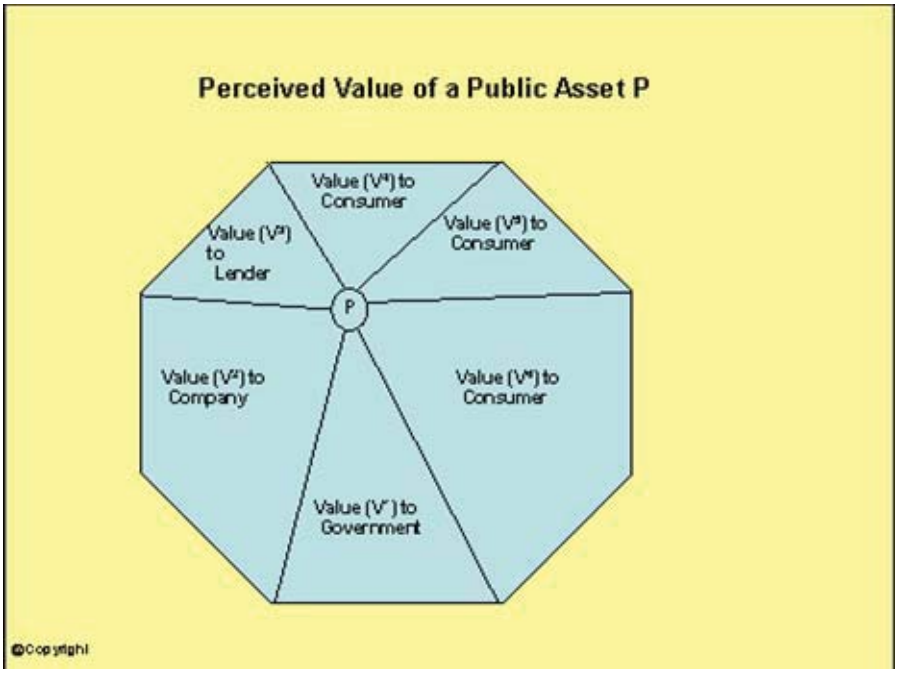

Figure 5 Different number stakeholders with different values for the same public asset

The value of the public asset may also change in value to each of the stakeholders over time as is illustrated in Figure 6.

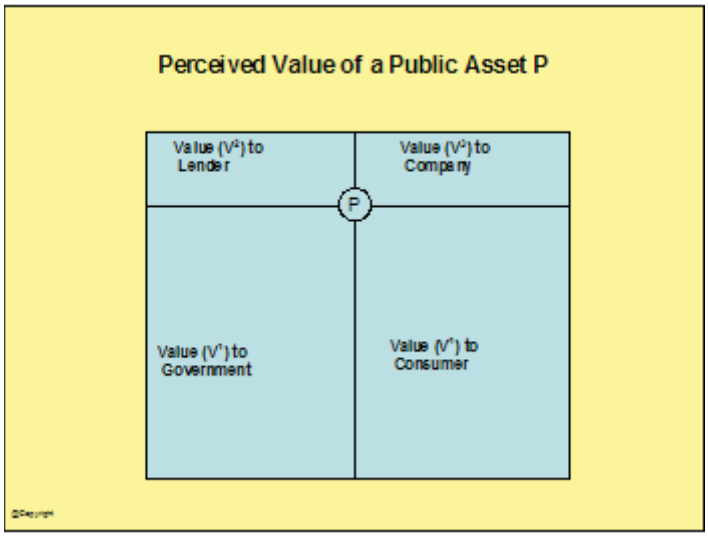

Figure 6 Value to each stakeholder may change over time

Therefore the value of the same public asset is different to each of the stakeholders depending on what evaluation method is used and depending on the stakeholder's perspective. Equally Figure 5 can be adapted to represent the different perceived benefits and also costs – as illustrated in Figures 7 and 8 – for each of the respective stakeholders.

What is important to note is that the value is not equal to the total quantitative net benefits, nor equal to the costs of creating an asset. The value may be greater and over the lifetime of the asset the value may decay or depreciate to a residual value whilst extra costs may be incurred to maintain the asset in order to derive continued benefits for the users.

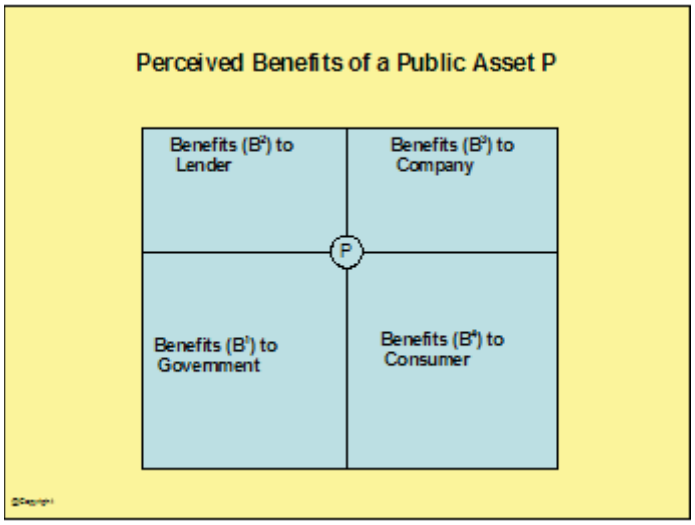

Figure 7 Polygon of the perceived benefits of a public asset

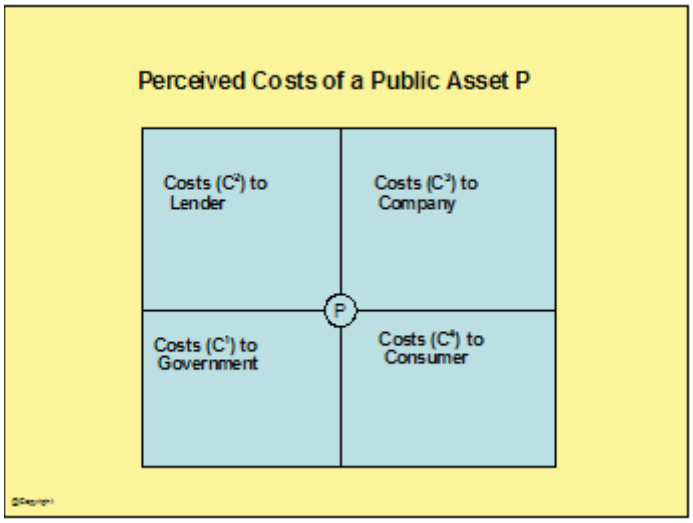

Figure 8 Polygon of the perceived costs of a public asset

For example what value would a married couple place on a house? Depending on what stage of their lives they are in, the value may be different. If they have young children, it may be important to the couple that there are schools close by and that there are amenities such as parks and shops in the neighbourhood.

The size of the house may be important to the couple. The layout of the house may be important. In other words there are a number of different things associated with the house that determine the value of the house to the couple, and subsequently what price the couple will pay for the house.

Then there is the market value of the house. Compare, for example the price of a standard 100 sq. meter house in Dublin, Ireland to that of a house in Amsterdam. Simple laws of economics will determine the value of the house, namely supply and demand (McDowell and O'Grada 2004). People place different values on the same asset depending on their needs at the time. So to determine the value of an asset, such as a school, there are a number of different views of what is the value.

In this example, there is the government, the Department of Education, the school's management, the teaching and administration staff, the students, the parents, the businesses that support the school. There is the community. Each one will have a different value for the school but in accounting and economic terms there are clearly defined statements and rules for the determination of the asset such as GAAP and FRS. From the perspective of the government, there is the traditional accounting way of valuing a school from how much the school cost to build and operate? The asset is shown to be consumed in accounting terms by depreciating the asset in the accounts for the school. Usually a system of accrual accounting or capital budget is used to determine what resources a government body has to spend on delivering its public service. In business terms, value is regarded as the profit which is the selling price less the total cost. But the school is not selling anything and the school is operated on a non-profit basis. The school as an asset that produces a merit benefit such as education is not a profit maximiser for the shareholders but rather maximises the merit benefits for society (Shaoul 2005).

What value does the education of a pupil bring to society? The Indecon Report (2006) recommends that each graduate will earn an average of €36,000 per year over 40 years of their life compared to the average wage of a person who did not attend third level, which is €30,000. These figures are specific to Ireland compared to the USA. These figures are averages and are actually too low due to the tax contributions from the individuals; also salaries increase over the career of most graduates. Gurdgiev (2008) presents the statistics that the value of third level education yields an overall society wide return of productivity of 33 percent higher than the private sector. This strengthens the argument for the Irish government to invest in the rejuvenation of its educational assets.

What can be seen is that value of a public asset, such as a school, changes with time over its whole life span. The value of a school depends on the perspective of the stakeholder and which definition is applied, that of the accountant, the economist, society or the individual. The additional benefit or increase in value due to a sustainable building, green value, is often not included. Lockwood (2007) argues that using sustainable methods in the design, build and operation of buildings can increase the net value by as much as 20 per cent.

6 Evaluation methodologies

There are established and accepted evaluation methodologies (Reilly and Schweihs 1998). It is often case that the mistake made is to use a decision-making tool such as CBA to determine the value of an asset. This is an incorrect application. CBA is a decision-making tool; it does not establish value of the underlying asset.

The stakeholders in a simple form of a PPP are the government, the company, the lender and the consumer. Each has different values that they place on the public asset. In accounting terms, the valuation of any asset can be determined using a variety of different formulae and techniques. However it depends on the characteristics of the asset – they will dictate which technique is fit for purpose. An asset is consumed by a company to deliver a benefit to its shareholders; the benefit is in the form of a dividend which is paid to the shareholders, thus increasing the wealth of the shareholders. The value of such a commercial business is expressed as the book or market value. The financial health of a company is generally accepted as being represented by its balance sheet, cash-flow and profit and loss statements.

The balance sheet contains a list of all the assets and liabilities including shareholders' equity. These assets can be both tangible (real, physical such as cash, product, buildings and equipment) and intangible (such brands, goodwill and reputation). The balance sheet, in simple terms, lists all assets and liabilities including the cost of equity.

So the 'book' value (BV) of the company is simply

$$BV = \sum \text{Total Tangible Assets} - \sum (\text{Total liabilities} + \text{Equity}) \quad (1)$$

Often, the simplistic gross sales less the total costs is taken as the book value however this may not include all liabilities such as shareholders' equity which is a cost of capital. Capital is used to generate an asset from which shareholders derive a benefit.

The market value (MV) is defined as:

$$MV = \sum \text{Total Assets (Tangible + Intangible)} - \sum (\text{Total liabilities} + \text{Equity}) \quad (2)$$

For example, take the company's traded share price on the stock market and multiply it by the number of shares. This is the company's market price, the price that a willing buyer is prepared to pay for a share. The difference between the market price and the book price is a measure of the intangible assets such as goodwill or the potential for future earnings.

Other financial models use future earnings as a proxy to assign a value to an asset. These tools have evolved from Portfolio Theory (MPT) as illustrated by Buehler, Freeman and Hulme (2008). Models and techniques in evaluating a portfolio of assets, such as those developed by Lintner and Sharpe; Millar and Modigiliani, and Black and Scholes, are widely accepted as good tools for measuring risk associated with the valuation of an asset. However, this portfolio theory of asset pricing has been challenged in recent times.

The value of a company may be determined using the Gordon Growth Model which states that the share price is the sum of the company's total future earnings divided by its cost of equity minus its growth rate.

$$P = \sum E / K_e - g \qquad (3)$$

Where P = Price of share
E = Future earnings
K_e = Cost of equity
g = Growth rate of the market

Some variations of this model will substitute the cost of capital (debt plus equity) for the cost of equity which is the total equity plus the total debt for K_e and in other circumstances, the weighted average cost of capital can be used. Care must be taken in each situation when applying these models to determine the value of an asset. The reason for care is that these formulae make certain assumptions regarding risk and interest rates over a short time scale of 3–5 years as opposed to the lifetime of a PPP which could be 99 years.

Another model is the CAPM. If the CAPM is adopted and applied, the value of a firm is:

$$\sum E = R_f + \beta(R_m - R_f) \qquad (4)$$

Where $\sum E$ = Sum of future earnings
R_f = Risk free rate such as a 20 year US Government Bond
β = Beta a weighted measure of how the share will perform in relation to the overall market
R_m = the measure of risk of the individual company

CAPM uses the proxy of the measure of return risk to determine an input into the value of asset. There are variations to this but what is critical is that the conditions for the model to be applied are understood.

Damodaran (2002) states that the CAPM (risk and return) model has been in use the longest and is still the standard in most real world analyses of a portfolio of assets. He proposes that risk, as defined in finance, is measured based on deviations of actual returns on an investment from its expected returns.

The problem with all of these risk option pricing mechanisms is that they are limited by their respective criteria and normally fail when applied to empirical data. However the weakness is that they all depend on an interest rate which varies over the life of a PPP.

7 Cost–benefit analysis

The economic value of a project should include all of the costs and all of the benefits. A tool or technique that is often used is the Cost–benefit analysis (CBA) but this does not determine the value of the underlying asset. It is often used as a decision-making tool in order to decide which alternative projects should be chosen. The economist measures the value of asset by what the asset contributes positively to the wealth of a nation. It is the sum of all the benefits less the sum of the total costs.

$$EAV = \sum B - \sum C \qquad (5)$$

Where EAV = Economic Added Value
B = Total Benefits
C = Total Costs

What is critical is how the total costs are identified and measured and similarly how the total benefits are measured. There are a number of accepted quantitative and qualitative techniques such as shadow pricing and willingness to pay.

Due to the nature of public projects, the tools required for decision making and evaluation were quite scientifically developed over time. There are three alternative tools such as:

- Equivalent annual worth
- Rate of return
- Benefit–cost ratio

All four tools make the assumption that:

- All cash flows are known for the life of the project
- All cash flows are measured in monetary terms
- All interest rates are known
- The comparison of projects is on the basis of before tax cash flows
- All intangible benefits that cannot be measured are excluded from the evaluation
- Availability of funds is irrelevant

(Yescombe 2007; Rogers 2001 et al.)

The tools used to determine VfM for PPPs do not meet these criteria.

CBA is a decision-making tool based on economic and accounting principles. These tools require specific assumptions to be made which are not compatible with the intangible and intrinsic nature of a PPP.

A number of autonomous bodies use the term VfM for determining whether a project has enhanced value using a PPP. The Green Book from the UK Government (2008) offers a set of comprehensive guidelines on how VfM can be established using the Public Service Comparator (PSC) to determine whether a PPP project offers VfM. The

PPP Task Force in Ireland is the NDFA; they produce a comprehensive set of guidelines for PPPs and a number of tests to determine VfM. But what is VfM?

8 Value for money

Farrell Grant Sparks (1998) define VfM as the optimum combination of cost, quality, efficiency and effectiveness. Yescombe (2007) defines VfM as the combination of risk transfer, whole life cost and service provided by the facility as a basis for deciding what offers the best value to the public authority.

VfM is a measure used to determine whether PPPs increase VfM over traditional procurement methods and the decision-making tool CBA is one of several tests. Other VfM tests use the tools of NPV, IRR and B/C ratio. In accounting and economic terms, value is perceived as a net benefit from the use of an asset. In order words, if the benefits accrued to the public exceed the costs incurred, then the public has received VfM.

In determining the value of a public asset, it is necessary to do an evaluation of an asset. Damodaran (2002), Pratt and Grabowski (2008) and Pratt and Niculita (2008) have written extensively about the valuation of any asset. The methodology used is driven by questions concerning what the purpose of the appraisal is and who the audience is (Reilly and Schweihs 1998).

The NDFA in Ireland issues specific guidelines for the measurement of VfM (see http://www.ndfa.ie/home.html). The NDFA identifies the optimisation of risk allocation as central to deciding whether VfM is achieved. This is dependent on the following risk factors and how their weightings are applied in the Risk Allocation Matrix to determine VfM. However, the approach to risk will vary from PPP to PPP and from country to country. The area in which the author believes further research is required is the transfer of risk. In the Irish situation, the NDFA considers the following risk categories:

1. Project specific
2. Planning and environment
3. Design and technical
4. Construction (overspend or delay)
5. Demand and revenue
6. Operational and maintenance
7. Financial and insurance
8. Political/ethics/regulatory/legislative/legal/contractual
9. Technological and obsolescence
10. Residual value

These risk factors are weighted and used as inputs in determining whether a project passes the tests for VfM. Risk and uncertainty are used as proxies to establish VfM however value does not equal cost or benefit as illustrated by Figure 9. However all three are characteristics of an asset and can determine whether the asset P offers VfM. Risk is used as a proxy for determining VfM.

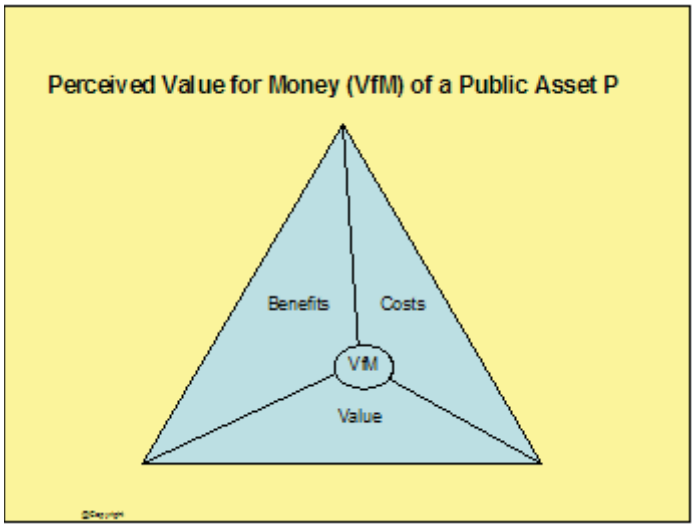

Figure 9 Perceived value for money of a public asset P

9 Conclusion

The first objective is to clarify what the value of a public asset such as a PPP infrastructure is? In order to address this question, the author will present fundamental definitions of what a PPP is, what an asset is and what value is? The second objective is to clearly explain what value means from the perspectives of the different stakeholders, and the author introduces a graphic model to illustrate what 'value' means to each stakeholder. The third objective is to review some of the current methodologies that are applied in the decision making with respect to PPPs and different evaluation techniques. The fourth object is to critique the use of some of techniques and tools. Finally, the author will review the concept of VfM for a PPP and present his conclusion to the question 'Are PPPs a licence to print money'?

The value of a public asset is determined by the standard accepted rules such as FRS and/or GAAP. The evaluation methodology that is applied depends on whose balance sheet the asset resides on and on which side of the balance. So if the asset is valued from the perspective of the public agency, it is a cost or a liability and that is its value. In determining whether a decision is made to proceed with a specific project the use of a CBA is one of the VfM tests for a PPP. If the asset is on the balance sheet of the private consortium, then the value is determined as a function of future earnings in perpetuity.

The concept of the Polygon of perspective value clearly illustrates how the same asset can have different values to different stakeholders and how this may change over time.

The author has reviewed the different evaluation methodologies and tools for decision making. The conclusion is that these methodologies and techniques are fit for purpose provided care and attention is taken with respect to the assumptions that apply for each.

Do PPPs offer VfM or are they a licence to print money? As a learned colleague once said 'Price is what you pay, value is what you get'. Yes PPPs do offer value for money, however the price is that is paid is subjective and depends on the perspective of the

buyer and the seller. Are PPPs a licence to print money? That depends on the terms and conditions of the actual binding contractual agreement and market conditions.

The outcome of this paper is that there is a requirement for further research into the whole area of risk transfer and whether the reward for carrying the level of risk is proportionate and appropriate. The next step is to investigate the different models and methodologies that are applied in determining the value of risk transfer in a PPP project compared to the traditional methodologies of procurement (Figure 1). Yes a PPP does offer value for money if best practice guidelines are adhered to, particularly in the design, build and transfer stages of delivering large-scale infrastructure projects.

But price is what you pay on the day.

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