The miscellaneous desirability of Public-Private Partnerships and an approach to design an appropriate constitution

Sarah Jamil

Faculty of economic and behavioural sciences
Department of general economic analysis,
Section of economic policy
Platz der Alten Synagoge
D-79085 Freiburg

January 2008

Preliminary version

Outline

1. Introduction

Public-Private Partnerships – a new form of procurement that is supposed to be the latest invention at the ending of the nineteenth century. Politicians all over the world are fond of this novel way of delivering public services and infrastructure. They do not get tired of telling about the advantages of incorporating specialised skills from private firms, lower costs, higher efficiency and faster realisation of projects.[1]

A closer view on this topic makes obvious that PPP are no phenomenon of the nineties, this way of procurement has been existing since the Roman Empire. Further, PPP have characteristics that are much more attractive for a political agent than those just mentioned. Politicians are confronted with capital improvement needs all over the globe, but the ability of the public sector to fund investments from general revenue or borrowing is restricted.[2] PPP allow transferring risk away from the public sector to the private and it also relieves the public household. While a public project requires immediate payment against the public budget, the costs within a PPP are spread over the lifetime of the facility. The government pays a user fee to a private operator that bears all costs in advance. There is no real monetary gain for the government, but it allows breaking free from the restriction of the household in the short run. When the contract expires the government has to buy back the facility, or it will be transferred back automatically. Empirical data show that the performance of PPP are often questionable and vary within the branch.[3]

It is difficult to demarcate PPP from other forms of public and private cooperation as there exists no uniform definition for PPP. A PPP can be described as a contractual relation between the state and a private party. The state delegates a task to the private firm, namely the construction and operation of an entity for a certain period of time. When to contract expired the government either has to buy back the facility or it will be transferred back automatically.

Hart contributes the paper *"Incomplete Contracts and Public Ownership: Remarks, and an Application to Public-Private Partnerships"* to the question

[1] See www.ppp.nrw.de, or www.ppp.niedersachsen.de.
[2] See the Maastricht criteria or requirements of the IMF.
[3] See Institute of Public Policy Research, Building better Partnerships, (IPR) (2001).

whether traditional procurement or PPP is preferable.[4] He provides a normative guideline without giving recommendations how to implement his insights. His outcome correlates with empirical data that some branches should not be candidates for a PPP, while others are. There are two major assumptions in his examination: contracts are incomplete and the respective underlying incentive structure determines the desirability.

The research background is constitutional economics that assume a self interested agent, instead of a benevolent agent, appearing as an omniscience of the scientific observer.[5] The government will be designed as a leviathan that does not has to compete for budget funds with other. The rules have to be designed in a way that prevents the leviathan from exploiting the citizens. The emphasis that the constitutional approach puts the role of rules makes it a predestined background. Within the new institutionalism the constitutional economic approach concerns the analysis of rule systems and not the choice within restriction.[6]

This contribution designs a constitution behind a veil that can force a non-benevolent dictator to comply with desirable rules for PPP. In the post constitutional stage there will be asymmetric information and there will be a principal-agent relationship between citizens and the government. The mechanism design theory founds the examination of appropriate constitutions. The constitution will be designed in a way so that the government will follow a rule for PPP that is in its own interest, as well as in the interest of the citizenry. So, the designed constitution will be incentive compatible and excludes a fallback into the anarchic chaos.

The first section of the paper gives a rough overview of cooperation between the public and private sector. Some examples are mentioned that had a remarkable relevance in the world history and some will illustrate how the incorporation of the private sector lead to great failure.

After that the next section will give a general idea how a PPP affects the public budget and why this new form of procurement is very interesting for politicians that face constrained budgets.

[4] See Hart (2003).
[5] Especially Buchanan rejects the assumption of an external observer ((1977), pp. 142).
[6] See Leschke (1996), pp. 76.

Harts model illustrates a normative guideline that explains the difference among bundled and unbundled provision. It gives clear recommendations when a public project should be carried out bundled or unbundled. It is the foundation for the constitution that is being designed at the end of the paper. It tries to make a selfish politician to comply with those normative guidelines, even though he has strong incentives to realise projects in form of PPP.

2. Historical overview of public and private sector cooperation

Public-private ventures have existed since a long time. This opposes the widespread opinion that the involvement of the private sector is a feature of a new era. The first records which prove the existence of private engagement in the public sector are from the time of Caesar Augustus. The Roman Empire gave concessions to the Salassi tribe which authorised them to raise money from travellers coming across the saint Bernhard Pass. In return the tribe maintained the pass and provided guidance across the mountain.[7] When reviewing the history of the ancient Rome the engagement of the Salassi tribe was not the only example for private involvement in public affairs. The emperors, especially Augustus, commanded the construction of temples, thermal springs, libraries and aqueducts. These buildings were edified by private builders. It can be proved today that the Empire raised profits from their building activities.[8][9]

The involvement of the private sector in public affairs was also very common in Europe since the 13th century. For example the London Bridge that was put up in 1228 under King Edward III was a toll bridge. Its construction was financed by the release of tolling rights. During the Spanish War from 1585 to 1603 private engagement in public affairs was vital to the raise of England as a sea power. The vessels which were captained by Sir Francis Drake and Sir Walter Raleigh were financed by merchants and aristocratic landowners. More ships have been owned by privateers than by the Queen.[10] In the "West Indian Raid of 1585" Queen Elizabeth contributed 2 of 25 ships. Sir Francis Drake acted as the Queens´ Admiral and had to follow official instructions. When the English fleet

[7] See Grimsey, Lewis (2004), pp. 42.
[8] See Stadtmüller (1996), pp.138-140. „Wirtschaft und Handel im Imperium Romanum" in: Weltgeschichte: Rom und der Osten, vol 3.
[9] Here should be mentioned that the huge profits might not be necessarily linked with the participation of private builders, but rather the employment of slaves.
[10] See Wettenhall (2006), pp. 24.

defeated the Spanish armada under Drake just 24 ships were supplied by the Queen. The remaining ships were owned privately.

In 1706 so called turnpike were established in England. Turnpikes are paid by travellers. The money was collected at toll gates. The "turnpike-trust" was formed in 1706. Trustees were authorised to raise capital to build a new road or to improve the already existing one. A surveyor was determined to supervise the construction and maintenance of the roads. The collection of tolls was delegated to "toll farmers" via franchise system. They paid a certain amount on the trusts in return for having the right to collect tolls on gates of the turnpikes. Reviewing the importance of private engagement in operating and constructing the British infrastructure it is not astonishing that the London Underground was build by private firms from 1894 to 1907.[11]

The colonial expansion was remarkably influenced by private engagements. Mainly in form of private trading companies like *The East India Company.* Apart from the British Empire the Spanish expansion was supported by public-private mixes. In 1700 the Spanish government had contractual relationships with private fiancées which provided troops and ships. The fleets connecting Spain with its American possessions were privately owned.[12]

Mercenary armies are a conflict-ridden example of private engagement in public affaires. Private purchasable armies have a history of several hundreds of years. Until the 18th century when modern states established standing armies, mercenary armies were quite accepted. Afterwards they caused displeasure in mature societies. In the 1990s around 90 private military troops operated in Africa.[13] Machiavelli, who lived in the age of renaissance, composed the famous work, *"Il Principe"*. He writes about the mechanism of power and uses several examples to show how a monarch maintains his power and why he sometimes looses his lordship. In that context, he evaluates the existence of mercenary armies and points out the danger which is linked with the aspect that they are not loyal to the prince and prior follow their own interests. He argues that mercenary armies are useless and any lord who relies on them will not be able to establish his power in a sustainable way. The wish to be a soldier is a purely financial aspect. As an example he mentions the First Punian War in which Kathagian

[11] See Grimsey, Lewis (2004), pp. 46.
[12] See Wettenhall (2006), pp. 28.
13 See Wettenhall (2006), pp. 26.

mercenary armies turned against its leader Epaminondas. After his death, Philipp from Macedonia became the new commander and than he took away the freedom of the Carthagians.[14] So, not all private engagements can be justified as a good instrument in achieving a certain goal.

At last, examples of the prison system of the United States in the 20th century are being introduced in order to highlight the dangers of private engagement in public affairs. Private firms or employers were able to lease prisoners. They had to pay for their food and accommodation and therefore the prisoners were left over to them as workers. In 1866 the prison in Tennessee leased its prisoners to a furniture company for 43 cents per day per worker. The cooperation was interrupted when prisoners burned down the furniture factory. Then, the prisoners were leased to coal mines. This caused problems again, because free minors were worried about their jobs. As a consequence, they freed the prisoners. A prison in California in 1851 had to close down after a very high increase in crimes. Further, prisoner had to build up other prisons and so on. Those forms of public private partnerships generated serious problems and hence the criticism of humanitarian reformers and even business and labour reformers. Humanitarians reported a high death and injury rate and blamed the private firms. In 1842 the use of prisoners for labour was restricted by the New York legislation and that was the end of PPP in the prison sector. When the Second World War began, no privately operated prison was left[15]. Today private prisons have a Renaissance, especially in the United States.

However, these are not the only examples of current public and private cooperation. Today one can find other areas in which PPP are popular such as in the construction of the railway system in Europe, the United States and Australia.

In the 20th century there was a shift back from private provision there to public ownership. In many countries the provision of public infrastructure and services was seen as a task of the state. As mentioned above, except France, which involved the private sector in the water and wastewater services, most European countries provided public services by the state in these days.[16] All examples

14 See Machiavelli (2001[1513]), pp. 64-68.
15 See Schneider (2005), pp. 199-202.
16 See Saussier (2007) for an examination of waste water distribution in France.

from the early engagement of privates do not fulfil the formal requirements of a PPP, such as a contractual relationship with a renegotiation phase etc.

This section gave a short overview of famous public and private cooperations and thereby opposes the political view that private engagement is a remarkable novum of the nineties. The next part will give insights why involving private partners within PPP is so desirable for politicians and why they want to make the citizenry to believe that the new form of procurement is attractive.

3. Political aspects of PPP

Driving forces

In 2004, 17 European countries[17] had experiences with PPP. Those projects apply to wastewater treatment works, public use motorways, toll roads, power plants, telecommunications infrastructure, tunnels, school buildings, airport facilities, toll bridges, government offices, prisons, light rail systems, railways, parking stations, subways, research activities, security, forestry, harbours, pipelines, road upgrading and maintenance, health services, urban restructuring waste management and operation of cultural facilities, such as, museums. While most countries use a concession model some established a task force to develop PPP or PPP programmes.[18]

There are factors which are ubiquitous and foster the usage of PPP worldwide. In developed countries as well as in emerging countries there are capital improvement needs. They are increasing as the demand increases. Further, the ability of the public sector to fund investments from general revenue or borrowing is restricted. The reasons are numerous. Decreasing number of tax payers, expenditure requirements in social areas and international limits on budget deficits and public debt such as the Maastricht criteria or obligations from international financial institutions such as the IMF and capital markets are restricting factors. So, many governments try to make public expenditure more predictable and try to limit the extent of deficits.[19] But it is not only the restriction on public borrowing that makes it attractive for governments to minimise their debts. Financial journalists and the voting public honour such

[17] The mentioned countries are Bulgaria, Croatia, Czech Republic, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Netherlands, Poland, Portugal, Romania, Slovenia, Spain and the United Kingdom.
[18] For a worldwide overview of countries and realised PPPs see Yescombe (2007), chapter 3.
[19] See Bastin, (2003), pp. 10.

kind of austerity. Balanced or surplus budgets evoke the compliments from international financial markets. This generally results in better major credit rankings. This enables the government to borrow money at lower interest rates.[20] PPP become the function of an instrument which transfers the financial risks away from the public sector there to the private sector. In continental Europe regional and municipal governments are confronted with restricted public finances and limited ability of borrowing. The strong need of investing in infrastructure strengthens the advantageousness of PPP.

Impact of a PPP on the public household

In general, the government pays for the provision and maintenance of public facilities and services. They appear in the expenditure group of the public household. When a public facility is being announced as a PPP, the provider is responsible for the maintenance of the facility and provision of service. The property rights remain with the state. When the contract expires, the government has to buy back the facility. The provider receives a fee for running the facility. The duration takes at least 15 years, in general, 25 years. If the government announces a public project, such as a new entity, a PPP is a possible solution. In the life cycle conception, planning, building and operation are announced altogether. The private contracting party receives a fee for the operation of the entity and a purchase price when the project is over.[21] The primary reason for the recent grow is that they do not require funding from the public sector. The capital costs of a facility can be spread over its lifetime. This contrasts traditional procurement where the costs have to be charged immediately against the public budget. These costs are charged through the payment of service fees within a PPP. PPP solutions enable governments to break free of short-term constrains in investments in infrastructure. This raises the legitimate question if budgetary constraints on infrastructure investments which create a need for PPP solutions are appropriate. It will be examined later whether PPP are more than "off-balance sheet borrowing" by governments.[22]

Michael Glos, the German minister of economic affairs names PPP an instrument that releases the administration, induces competition among potential

[20] See Coghill, Woodward (2006), pp. 82; 83.
[21] See Grimsey, Lewis (2004).
[22] See Yescombe (2007), pp. 17.

producers and is an alternative to the inefficient administrational scope of the government. He recommends implementing a PPP if it turns out to be efficient over the whole life cycle of the project.[23] When he mentions efficiency, he refers to costs not to quality. Like other politicians, such as Dirk Niebel[24] or Manfred Stolpe[25] he calls PPP preferable because of a cost advantage at the beginning of the life cycle of about 6-19%[26]. As the duration is generally about 20 years, it is difficult to evaluate a whole project right at the beginning.

Political and economic decision makers such as Ronald Pofalla[27], Klaus Wilhelm Lippold and Hans-Peter Keitel[28] assign the Anglo-Saxon countries a forerunner role.[29] The PPP projects are realised much faster and cheaper. None of them refers to aspects of quality or the huge number of PPP which failed in the very beginning. Again, they evaluate PPP at a time when the duration is not expired.

Internet websites of governments often include information about PPP.[30] Generally these sites include information that are dedicated the positive effects of a PPP. They are presented as new concepts that induce competition, combine public tasks with innovative entrepreneurship and technological know how. Especially politicians claim the efficiency of the private sector as important positive feature of PPP.

So, politicians of all party background seem to be very fond of this new form of procurement. But how reasonable is this way of financing public goods really? In the next part a normative model will be introduced that will try to give insights whether traditional procurement or PPP is preferable. It will be examined if politicians are driven by the wish to break-free form financial restrictions or whether PPP are just an advantageous form of procurement that promotes social wealth.

How attractive are PPP from the perspective of a citizen? On one hand it can be seen critical, because the delivered service quality can not be guaranteed.

[23] See Glos (2006), pp. 49.
[24] Is secretary general of the FDP since 2005.
[25] Federal minister for transport of the SPD from 2002-2005.
[26] See Stolpe (2006), pp. 68.
[27] Is secretary general of the CDU seit 2005.
[28] He is CEO at the HOCHTIEF AG since 1992.
[29] See Pauly (2006).
[30] For example the German government formed a „PPP Taskforce“. The fields of activity and advantages are published on the website of the government.

Further, the awarding authority (the state) can hardly influence the private provider referring the characteristics of service.[31] On the other hand a constrained budget will not allow the construction or maintenance of some infrastructure. Then PPP are the only alternative that can realise such investments, because the payments are spread over the lifetime of the project. The next section will illustrate that some projects are better realised in form of PPP and some in form of traditional procurement (TP).

4. Normative recommendations whether to bundle (PPP) or to unbundled (traditional procurement)

The following examination refers to an unpleasant circumstance as described in the previous literature of privatisation. The theory of the firm implicates incomplete contracts. That means suboptimal outcomes are a result of the fact that uncertain events can occur in future and can hardly be fixed in a contract. Within the privatisation literature there are always complete contracts assumed. Consequently, suboptimal outcomes result from moral hazard and asymmetric information. If for every decision a complete and an incomplete contract are taken as a basis, two things will become obvious. The incentives for the agents and the role of property rights will have an impact on their investments.[32]

The production process both in the public and private sector is plagued with incentive problems that are due to different objectives and asymmetric information between the principal and the agent.[33] Even though both sectors face the same agency problem, it is easier for the private firms to deal with incentive problems and they will therefore lose less of their productive efficiency.[34]

When contracts are incomplete, incentives to promote productive efficiency do depend on the allocation of ownership of the asset. Private ownership can then be superior in terms of productive efficiency.[35] The fundamental insight is that the owner of the asset has the right to control under all circumstances. This is of

[31] The characteristics of this fact will be examined in the next section.
[32] See for example Hart (2003).
[33] See Laffont, Martimort (2002) who consider principal-agent models more general.
[34] See Brealey et al. (1997).
[35] This conclusion has already been stated in Hart, Shleifer, Vishny (1997), Grossman, Hart (1986) and Hart, Moore (1990).

particular importance when contracts are incomplete, because ownership involves bargaining power in non-contractible situations. If the owner wants to make an investment that cuts production costs without affecting the service quality, he can do so without renegotiating the contract that only determines service provision. Vice versa, if one party wants to implement an investment without being the owner, they have to gain admission within renegotiations with the owner. So, the owner has the stronger incentive to promote productive efficiency by appropriate investments. The need to seek the owner's consent for efficiency-enhancing investments implies that the public sector is not able to design a contract for a private manager of a public asset that would generate the same level of productive efficiency as private ownership. Within the negotiations the manager will lose parts of the investment gains.[36]

Theoretical framework

Hart examines two cases with two different contractual arrangements[37]. In the case of a PPP the government contracts with a private party, which is supposed to build and run the prison. The builder has the opportunity to subcontract with a third party to run the prison. In case of a conventional provision, the state signs two different contracts: one contract with the builder and one contract with another party to run the prison.

The decision whether to bundle crucially depends on the definition of externalities and investments. In case of a PPP the government contracts with a private party, which is supposed to build and run the facility. The builder has the opportunity to subcontract with a third party to run the project. In case of a conventional provision, the state signs two different contracts. One contract with the builder and one contract with an operator.

The chronological sequence is the following:

t=0 the state signs a contract with the builder to build a basic prison for price *P*. The price refers to basic standard requirements. The prison is built

[36] How much the public owner can extract from this gain depends on how easy the private manager can be substituted. If the manager can be substituted the public owner can implement the innovation and then replace the manager. Then he can extract all gain. Conversely, if he is irreplaceable he can pocket the gain, but he has to get the approval of the public owner.

[37] See Hart (2003), pp. 71.

between *t=0* and *t=1*. The government either contracts with a builder or a consortium.[38]

t=1 the prison starts to operate till *t=2*. In case of conventional provision the contract specifies the qualities of the prison in *t=1*. The price the government will pay to the operator is equal to the operation costs. If the operator is not the owner of the facility,[39] but a subcontractor of the builder he has to negotiate if he wants to implement an innovation.[40]

The desirability of both alternatives is displayed under different kind of investments first.

The resulting outcome is based on the idea that there are two different kinds of investments and respective incentives to do such investments.

i corresponds to productivity increasing investments. They lead to a more attractive building and better operation opportunities. For example, if a prison has programmes and special staff for the rehabilitation of inmates.

e stands for productivity lowering investments that cut costs and quality. For example, if a prison is equipped with electric fences instead with guards.

Within a PPP the quality of service is specified. The contracts are incomplete in case of bundling and unbundling. That means that the builder can vary the qualities of the prison or the service easily without violating the contract. The builder can make two kinds of investments: *i; e*, which affect the costs *C* and the benefits *B* of the prison in *t=1*.

$$B = B_0 + \beta(i) - b(e),$$
$$C = C_0 + \gamma(i) - c(e),$$
$$whereas: \beta, b, c \succ o; \beta' \succ 0; \gamma' \succ 0; c' \succ o \beta'' \prec 0; b'' \succ 0; \gamma'' \prec 0; c'' \prec 0$$

The prison generates social welfare, which is denoted with *B.*

i+e are the entire investments of the builder.

[38] The state may contract with the operator who then is the owner of the facility. The operator will subcontract with a builder. Hart does not consider this possibility. Bennet, Iossa (2005) who have a stronger emphasis on ownership consider this case.

[39] This case is excluded in Harts examination.

[40] This case is considered in Bennet, Iossa (2005), but Hart (2003) includes this case only indirectly. If the builder has a subcontract with an operator, they have to negotiate for the implementation of innovations, too.

In the FIFB[41] setting, *i* and *e* are chosen to maximise the net benefit which is denoted by

B-C-i-e, that means respectively,

$B_0 + \beta(i) - b(e) - C_0 + \gamma(i) + c(e) - i - e.$

The first order conditions are:

$\beta'(i^*) + \gamma'(i^*) = 1$

$c'(e^*) - b'(e^*) \geq 1$

if $e^* > 0$ then $c'(e^*) - b'(e^*) = 0$

The condition $c'(0) - b'(0) \leq 1$ states that *e* is socially unproductive.

This implicates $e^* = 0$ as the first-best solution. In the second-best case, the investments of the builder are nonverifiable and hence cannot be contracted on. Hart assumes, that the service provider can observe the investments *i* and *e*. A precise comparison of unbundling (traditional) and bundling (PPP) will give an insight into the respective advantages.

Separate contracts to built and operate (unbundling)

The building contract contains the price P_0 to which the prison is supposed to be built. In *t=1* an operation contract is written. The operator will receive an amount from the state which corresponds to the operating costs $C = C_0 - \gamma(\bar{i}) - c(\bar{e})$, where *i and e* are the builder's equilibrium choices. The builder chooses *i* and *e* in *t=0* to solve his maximisation problem:

$Max(P_0 - i - e)$

As the builder wants to maximise his profits, he will try to build the prison as cost-saving as possible. Consequently he chooses: $\bar{i} = \bar{e} = 0$.

The builder's choice affects the operator's price P_0 and the benefit for the state *B*. Hence, there will result a price:

$P_0 = \bar{i} + \bar{e} = 0$

The resulting benefit for the government is:

$B - C - P_0 = B - C - i - e$,

if the values for $\bar{i}; \bar{e}$ are evaluated with zero.

[41] full information first best

The builder will neither internalise the benefit *B*, nor the costs *C*. $\bar{i} = \bar{e} = 0$ means, that he invests the optimal amount of *e*, but less of *i*. Conventional appropriation is preferable, when the quality of the building can easily be specified within a contract, but not the properties of service. An underinvestment in *i* is not a serious issue. Under these conditions, an overinvestment in *e* under PPP may be a serious matter.

PPP (bundling)

The builder has the inventive to internalise the costs of service provision since he provides the service himself or via a subcontractor. He will offer the subcontractor a price equal to his

costs, $C = C_0 - \gamma(i) - c(e)$[42]. The builder chooses *i* and *e* to solve:

$$Max P - C - i - e = P - C_0 + \gamma(i) + c(e) - i - e$$

$$foc:$$

$$\gamma'(\bar{\bar{i}}) = 1$$

$$c'(\bar{\bar{e}}) = 1$$

There results a price $P=C+i+e$. The governments pay-off is:

$B-P=B-C-i-e$, for $i = \bar{\bar{i}}; and\ e = \bar{\bar{e}}$.

In this case, the builder does not internalise the benefit, but he internalises the costs. He invests more in *i*, but still not enough. He invests too much in *e*. PPP is preferable, when the quality of service can easily be specified in a contract and if the performance is measurable. An underinvestment in *i* at conventional provision would have much more negative consequences than an overinvestment in *e*.[43] A benevolent agent would prefer an alternative that yields the optimal values of $e^* = 0$ and a positive value of *i*, respectively the *first order condition.*

There is a trade-off between the two alternatives:

[42] See Hart (2003), pp. 73.
[43] See Hart (2003), pp. 74.

Under unbundling neither the social benefit *B*, nor the operation costs *C* are internalised. Under bundling, the builder does not internalise the benefit *B*, but he internalises the operation costs *C*.

Hart recommends that unbundling is preferable if the quality of the building can be specified well, but the quality of service can hardly be fixed. He recommends realising a PPP if the quality of service can be specified well, but not the building properties.

In other words, contracting out a public service to a private operator is economically justified when the quality is nearly completely contractible or when improvements in productive efficiency do not endanger service quality and when the inclusion of technical innovations to improve productive efficiency is crucial. Then private ownership can be utilised to promote productive efficiency and to uphold allocative efficiency in terms of service quality. Public ownership is desirable when the quality of output is difficult to contract on, when cost reductions have a bad impact on quality and when technical innovations don't play a role. In this case the conservation of the desired level of allocative efficiency requires giving up some productive efficiency.[44]

Hart specifies his conclusion by "being a little speculative".[45] Maybe prisons and schools fall into the first category and are candidates for unbundling, this means that contracting on the building is relatively easy, while contracting on the service is difficult. Hospitals may fulfil the requirements of a candidate for bundling. The service is too complex to specify it well is a contract, but there are appropriate performance measures for hospitals, for example how patients are treated.

The model does not include any rules how the *first order conditions* can be enforced. Further, the model is not free of criticism. For example, the demarcation of a hospital can be difficult. Some of its characteristics make it a candidate for bundling, while others would require unbundling. So, one might argue that this concept applies to a black-and-white world neglecting that there are also shades of grey. Although he raises some critic he was able to show that

[44] See Välilä (2005), pp. 104.
[45] Hart (2003), pp. 74.

the incentive structure that is linked with the concept of incomplete contracts influences the optimal decision whether to bundle or to unbundled.

Hart's model can be used as a normative guideline that gives clear instruction when to bundle and when to unbundle projects. However, in regards to a clear constitution, Hart's concept lacks clarity. The next chapter therefore meets the challenge to design a constitution that forces a leviathan to comply with Harts recommendations. This seems to be very demanding as the leviathan has an informational advantage in the post-constitutional world. Further, as described in section 3 the political agent has strong incentives not to realise projects in form of traditional procurement. Apart from that the asymmetric information in the post constitutional stage allows him to report circumstances that require bundled provision even if the state of nature required traditional procurement. So, the constitution should be designed in a way that makes the leviathan report truthfully.

5. Approach for a PPP constitution

The insights from Harts model are that there is a condition in which bundling is preferable to unbundling, when service can be fixed in a contract very well and when improvements in productive efficiency do not endanger service quality. Another condition is characterised by the desirability of unbundling, because quality of output is difficult to contract on or cost reductions lead to deterioration of quality. The leviathan has to report to the citizenry the actual condition. Since citizens suffer from a lack of information in the post-constitutional stage they have to rely on the leviathans report.

So there are two conditions $\{\theta^-;\theta^+\}$ that require different kinds of procurement.

The environmental conditions $\{\theta^-;\theta^+\}$ are defined as follows:

θ^+ denotes the state in which quality of service can be specified well, but not the quality of the building and so makes a PPP preferable.

θ^- denotes a state in which the quality of the building can be specified well, but not the quality of service and so makes traditional procurement preferable.

In case of symmetric information one could design a contingent constitution that requires the realisation of PPP in case of θ^+ and the realisation of TP in case of

θ^-. However, as the leviathan has an informal advantage he can always report θ^+ in order to realise a PPP. If he gives a wrong report in favour of a PPP he can realise a monetary rent π. So a contingent constitution will not be appropriate in case of asymmetric information.

A constitution that applies to principal agent problems under asymmetric information will bring an improvement.

The theoretical background for this is the principal agent theory which includes information economics as well as mechanism design theory.[46] The literature of mechanism design under incomplete information addresses the problem of setting incentives to guarantee honest revelation of private information.[47]

The principals, respectively the citizens design an incentive compatible coordination mechanism that makes the principal do so as the agents want him to and at the same time allows him to maximise his own utility.[48] The incentive system is assumed to be structured in a way that the agent is willing to reveal all his information about the state of nature honestly. Then, revealing the true condition is the best strategy for the leviathan to maximise its utility. Such contracts are incentive compatible.[49] In case of governmental restrictions, a rational agent will trade off the costs of breaking the law and the benefit from not complying.[50] Further, the underlying constitution is assumed to be enforceable.

Mechanism design generally has the form of a 3-step game. First, the principal designs a contract. Second, the agent can accept or reject. In case of a non-acceptance, he is left with his reservation utility that is equivalent to a fallback into anarchy. Third, if the agent accepts, the game is played according to the mechanism.[51] He will reject any mechanism or rule that seems irrational or undesirable to him.

Mechanism design is often applied in regulation context or in other post-constitutional situations. Then, the respective principals rely on signals from the

[46] For an introduction see Baron, Myerson (1982), Inderst (2001), Doepke, Townsend (2004), or Myerson (1982). Many contributions such as Baron, Myerson (1982), apply the mechanism design on the theory of optimal regulation.
[47] See d´Aspremont, Gérard-Varet (1992), pp. 145.
[48] See Fudenberg, Tirole, (1991), pp. 243.
[49] See Laffont (1989[1986]), pp. 154.
[50] See Kirchgässner (1993), pp. 183; 184.
[51] See Fudenberg, Tirole (1991), pp. 244.

agent.[52] Here, the objectives of giving a report to the principals depend on his information.[53] If the leviathan decides to participate, the anarchic levels of utility $\sum_i U_A^i; U_A^1$ will apply. That means that the citizens as well as the leviathan leave the anarchic chaos and receive at least the anarchic levels of utility. If one party's utility is lower that this level they will fall back to anarchy.

The rule consists of a parameter *x* that denotes the provision and maintenance of goods and services. In case that the leviathan will not join, *x=0* which refers to a world without state. The utility of the citizenry $\sum_i U^i$ is increasing if *x* increases until it reaches a maximum.[54] It is vital to incorporate the public utility level in the constitutional contract as the leviathan is able to extract the nationals rent.[55] Providing public goods and services is costly for the leviathan and restricts his financial scope. Therefore $\sum_i U^i$ displays disutility to him, as it is positive linked to *x*. Each rule *z* consists of ($x, \sum_i U^i$). The conditions $\{\theta^-; \theta^+\}$ determine the marginal augments of $\sum_i U^i$. The monotony condition

$$\frac{d}{dx}[\sum_i U^i(x,\theta^-)] > \frac{d}{dx}[\sum_i U^i(x,\theta^+)]; \forall x$$

fulfils the requirement that θ^- is the more significant condition ($\theta^- \succ \theta^+$).

As mentioned a fraction of public goods and services *x* can be financed via the public budget (in form of traditional procurement). Services and goods that go beyond the budget have either to be realised in form of PPP or cannot be realised at all. While a leviathan always prefers PPP over TP, it is optimal to comply with the respective conditions. So, the monotony condition reflects that θ^- is a condition in which TP is the appropriate solution. θ^+ is less significant as the citizens have lower preferences for PPP, because neither the quality is guaranteed, nor the quality of the infrastructure when the facility is transferred to the state. Further, the citizens have low preferences for a shift of state burden to the younger generation. There is still an advantage as the public budget would

[52] See Dasgupta, Hammond, Maskin (1978), pp. 185.
[53] See Myerson (1982), pp. 1767.
[54] See Maskin, Riley (1984), pp. 174.
[55] See Neumärker (1995), pp. 69.

not allow further investments in *x*. So, public utility increases more significant under θ^- when TP applies compared to θ^+ when PPP is realised.

The leviathan's indifference curves have the slope

$$\frac{d}{dx}[\sum_i U^i(x;\theta)]\Big|_{dU^1=0} = -\frac{\frac{\delta U^1}{\delta x}}{\frac{\delta U^1}{\delta \sum_i U^i}}$$

The side conditions

$$\frac{d}{dx}[\sum_i U^i(0;\theta)]\Big|_{dU^1=0} => 0; \frac{\delta U^1}{\delta x} \gtreqless 0; \frac{\delta U^1}{\delta \sum_i U^i} < 0$$

count.

The location of the indifference curves are determined by the environmental state. So indifference curves only cross once in (U, x) space.. In this context the single crossing property is used to describe the structure of preferences.[56] This allows determining utility functions that incorporate the participation constraint in dependence of the environmental condition. If θ^- applies the side constraint $U^1_{\theta^-} = U^1_A$ counts. Respectively, for θ^+ applies $U^1_{\theta^+} = U^1_A$. Both indifference curves have peaks that characterise efficient points. The location of the indifference curves are determined by the environmental state. Those pairs constitute FIFB combinations. The individuals would implement those combinations, contingent upon the occurring condition, if there was symmetric information on the post constitutional stage. The leviathan prefers indifference curves that are close to the x-axis, because this is followed by a lower public utility and therefore a higher utility for the leviathan.

When θ^- occurs, the leviathan will report θ^+ instead. Then, he can realise a rent CD. The incentive compatible constitution has to be designed in a way so that when θ^- occurs, he should get a rent that equals CD. That means that he is indifferent between reporting right or wrong. Referring the Epsilon honesty he will report truthful if it makes no monetary difference. This requires that the point on $U^1_{\theta^+} = U^1_A$ has to be to the left side of the efficient point. (In the graphic this is point E). In other words, the efficient points reflect the FIFB outcomes. As the leviathan has no incentive to report truthful an incentive compatible

[56] See Cooper (1984), pp. 570.

constitution has to be designed. In case of θ^+ one can assume that the leviathan will always report truthful. In case of θ^- the leviathan has to have a monetary advantage that is as high as in case of reporting wrong.

6. Conclusion

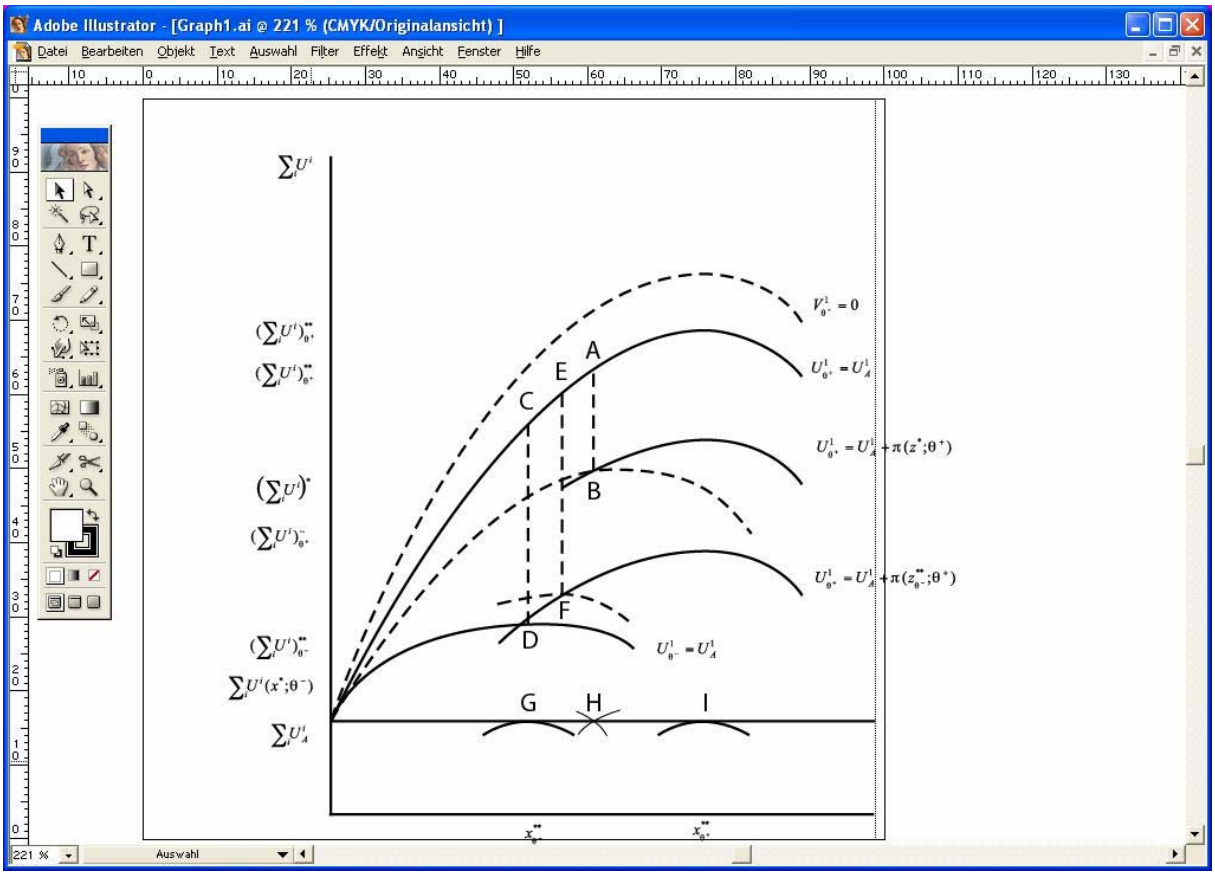
Partnerships between the public and the private sector have been existing a long time. Incorporating a private party does not necessarily mean a general improvement by higher efficiency or better labour conditions. The incentives of private firms can differ from those of the public sector and also from public interest. Hart showed in his model that under certain circumstances the incentives of a private party can lead to an undesirable outcome. At the same time a political agent has strong preferences for a PPP instead of TP.

The constitution faced the challenge to force a leviathan to comply with optimal behaviour, although it is not attractive for the leviathan and although there is asymmetric information so that he can easily conceal the true conditions.

Hart's approach is very preliminary. Other forms of constitutions, such as a constitution without incentive component, can be tested in order to show which outcomes will result from an inappropriate constitution. Further, the analysis of the constitution is much shortened. This analysis is rather a conclusion of the requirements of an appropriate constitution and not a derivation.

The analysis of PPP constitution can be enlarged in several ways. Harts model is preliminary, too, as it gives no answers referring a third period in which the facility has to be transferred back to the state, or how the residual value of the facility can influence the leviathan's behaviour, or if the leviathan prefers financing a PPP by taxes or user-fees. A feature that has been neglected here is that private firms can appear as rent-seekers who pay bribes to the leviathan if he deploys them as builders and operators. Once a party was announced as an operator it has strong incentives doing the building stage, too, because he can lower his future operation costs remarkably by appropriate building investments. So, the approach of the constitution is an intermediate step within a more complex project.

Appendix


Adobe Illustrator - [Graph1.ai @ 221 % (CMYK/Originalansicht)]
Datei Bearbeiten Objekt Text Auswahl Filter Effekt Ansicht Fenster Hilfe
A
B
C
D
E
F
G
H
I
221 %
Auswahl

List of literature

Baron, D. P., ***Myerson,*** R. B. (1982) "Regulating an Monopolist with Unknown Costs" in: Econometrica 50, pp. 911-930.

Bastin, J. (2003) "Public-Private Partnerships: A Review of International and Austrian Experience", in: Eilmansberger, T. (Ed.) Public Private Partnership. Wien. 1-25.

Bennet, J. ***Iossa,*** E. (2005) "Delegation of Contracting in the Private Provision of Public Services," Review of Industrial Organization, Springer, vol. 29(1), pp. 75-92.

Brealey, A. R., ***Myers,*** S. C. (1997) "Principles of corporate finance", 5th ed. New York.

Brennan, G.; ***Buchanan***, J. M. (1977) "Towards a tax constitution for leviathan" in: Journal of Public Economics, vol. 8 Issue 3, p255-274.

Brennan, G.; ***Buchanan***, J. M. (1988) „Besteureung und Staatsgewalt. Analytische Grundlagen einer Finanzverfassung".

Coghill, K***., Woodward,*** D***.*** (2006) „Political issues of PPP", in: Hodge, G. / Greve, C. (ed.), The challenge of public-private partnerships: learning from international experience. Cheltenham [u.a.]

d´Aspremont, C., ***Gerard-Varet,*** L.-A. (1992) "Non-Transferable Utility and Bayesian Incentives" in: Reinhard Selten (Ed) Rational Interaction Essays in honor of John C. Harsanyi.

Doepke, M***, Townsend,*** R. M (2004) "Dynamic mechanism design with hidden income and hidden actions" in: Journal of Economic Theory, Jan2006, Vol. 126 Issue 1, p235-285 .

Fudenberg, D; ***Tirole***, J. (1991) "Perfect Bayesian Equilibrium and Sequential Equilibrium" in: Journal of Economic Theory, vol. 53 Issue 2, p236-260.

Glos, M. (2006) „Das Miteinander-Prinzip" in: Pauly, L. (Ed) Das neue Miteinander : Public Private Partnership für Deutschland. Hamburg. 49-53.

Grimsey, D., ***Lewis,*** M. K. (2004) "Public private partnerships: the worldwide revolution in infrastructure provision and project finance". Cheltenham.

Grossman, S. J.; ***Hart***, O. (1986) "The Costs and Benefits of Ownership: A Theory of Vertical and Lateral Integration", Journal of Political Economy , vol. 94 Issue 4, p691-719.

Hart, O. (2003) “Incomplete Contracts and Public Ownership: Remarks, and an Application to Public-Private Partnerships”, in: The Economic Journal, vol. 113, pp. C69-C76.

Hart, O.; ***Moore***, J.(1999) “Foundations of Incomplete Contracts” in: Review of Economic Studies,vol. 66 Issue 226, p115-138.

Hart, O.; ***Shleifer***, A.; **Vishny**, R. W. (1997) “The proper scope of government: Theory and Application to Prisons”, Quarterly Journal of Economics, vol. 112 Issue 4, p1127-1161.

Inderst, R. (2001) “Incentive schemes as a Signalling device” in: Journal of Economic Behavior & Organization, Apr2001, Vol. 44 Issue 4, pp. 455-466.

IPPR, (2001) “Building better Partnerships” London. Institute for Policy Research.

Kirchgässner, G. (1994) “Constitutional Economics and its relevance for the evolution of rules”, in: Kyklos, Blackwell Publishing, vol. 47(3), pp. 321-339.

Laffont, J.J (1989[1986]) “The Economics of Uncertainty and Information”, Camebridge/Mass.-London.

Laffont, J.J., ***Martimort***, *D.* (2002) “The theory of incentives: The principal-agent model. Princeton.

Leschke, M. (1996) „Die Funktion der Moral in der liberalen Gesellschaft-Die Perspektiven der konstitutionellen Ökonomik“ in: James Buchanans konstitutionelle Ökonomik“, (Ed. I. Pies, M. Leschke).

Machiavelli, N. (2001[1531]) „Il Principe“. Stuttgart.

Myerson, R. B. (1982) “Optimal Coordination Mechanisms in Generalized Principal-Agent Problems” in: Journal of Mathematical Economics 10, pp. 67-81.

Neumärker, K. J. B. (1995) “Finanzverfassung und Staatsgewalt”. Frankfurt am Main.

Pauly, L. (2006) „Das neue Miteinander : Public Private Partnership für Deutschland.“ Hamburg.

Rasmusen, E. (1989) „Games and Information“, Oxford-Camebridge/Mass.

Saussier, S. (2007) “Public-Private Partnerships and Prices: Evidence from Water Distribution in France”, in: Review of Industrial Organization, Volume 29, Numbers 1-2, pp. 1-31.

Schneider, A. L. (2005) „Public Private Partnerships in the U. S. prison system" in: Rosenau-Vaillancourt, P. (Ed.), Public-Private Policy Partnerships, Massachusetts: MIT Press, 192-208.

Stadtmüller, M. (1996) „Wirtschaft und Handel im Imperium Romanum" in: Weltgeschichte: Rom und der Osten, vol 3. , pp.138-140.

Stolpe, M. (2006) „Investitionen mobilisieren, staatliches Handeln modernisieren" in: Pauly, L. (Ed) Das neue Miteinander: Public Private Partnership für Deutschland. Hamburg. pp.65-73.

Välilä, T. (2005) „How expensive are cost savings? On the economics of public-private partnerships", in: EIB papers no 1, vol 10, pp. 95-119.

Yescombe, E. R. (2007) Public-private partnerships: principles of policy and finance. Amsterdam ; Heidelberg [u.a.]

Wettenhall, (2006) "The pp interface: surveying the history" in: Hodge, G. / Greve, C. (ed.), The challenge of public-private partnerships: learning from international experience. Cheltenham [u.a.]