
Public Private Partnership Contracts Financing by Covered Bonds

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Abstract:

The provision of public properties that generate income for the public sector, used as securitization in government bonds, is under consideration both from public and private sector during the last few years. The efficient exploitation of the long term contracts under Public Private Partnership schemes (either infrastructures or other real assets) that produce steady cash inflows can result to a lower cost of borrowing-funding for the State, by linking the efficiently priced future expected cash flows of PPP's, with a special form of sovereign covered bonds issued by the Government. This paper, after a review of covered bonds advantages and recent market developments, examines the major parameters that governmental authorities should review and assess in order to achieve optimal pricing from a market point of view of PPP contracts. Such parameters include Primary Objectives of the public sector, expectations about future developments in inflation, growth and interest rates, availability of government funding and key objectives about management of Public deficit and Public debt, as well as the pricing sensitivities of PPP contracts expected cash flows on some of these factors. Also the paper develops and assesses the possible uses of PPP contracts for the purposes of enhancing the credit quality of new Sovereign Covered Bonds (Linked with PPP contracts), together with the broader objective of efficiently mobilizing the Public assets portfolio in delivering to the State, efficiently priced and optimal Public services and under specific conditions, lower cost of funding or refinancing for the State, compared to the unsecured senior debt obligations of the Government. The standard market model of the public sector in pricing PPP's projects is extended and connected to optimization of quantitative objectives of the Public Sector in order to achieve specific targets under different assumptions about the underlying variables. Issues of legislation, marketability and liquidity of the proposed schemes as well as mutual benefits for the market participants are highlighted as well as market practices from the private sector covered bond market.

Key Words: Covered Bonds, Public Private Partnership, Public Sector

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1. Introduction

Sovereign entities of the western world rely the provision of public services (defense, public health, education, public infrastructures etc.), when tax revenues are not adequate, to a large extent on the financing through a considerable amount of unsecured public debt via issuance of unsecured senior bonds. In that way, by running controllable and scheduled public deficits, they can meet the needs of the general government extra financing as well as the required financing of public investments, and public services.

On the other end, the States traditionally have on their “balance sheet” considerable amounts of real assets (real estate and related infrastructures, as well as monopoly companies and special resources monopolies), many of them being potentially income generating assets. Recent experience has shown that, the government is not always the best manager of its on balance sheet real assets, let alone the managing of its public debt obligations. Also it is widely accepted that the private sector is usually more efficient in pricing, developing, managing and operating business (and therefore managing the related risks) in a competitive environment, with limited resources.

As a consequence, Public Private Partnerships evolved as an alternative form of asset exploitation, between governments and competitive private companies, where each of the two partners brings to the contract its “comparative” advantages, in order to make the final partnership viable and profitable for both participants. Such structures that efficiently exploit assets and monopoly structures of the government through appropriate management from private sector companies, produce efficiently public services and manage to their full income generating potential, public assets, utilizing therefore the public property with private sector competitive standards.

The appropriate pricing of the expected cash flows of the contract from both sides, taking into consideration all the possible aspects of the project is very important for the negotiation process, and selection of the preferred private partner. Optimal pricing and efficient selection of the private entity are significant parameters for contract’s viability and profitability for all related parties.

Once a PPP is initiated on an existing asset or an asset to be built and run by a private company, this contract is the base of a stream of future expected cash flows, as well as residual value, and subject to many kinds of pricing risks, having an overall net present value as any other real income generating asset, priced in the market. Thus far, using the example of many European countries, the issuance of public debt for the financing of government deficits was by the issuance of senior unsecured bonds. In case of default or partial default of the issuer country, the investors have full recourse against the assets of the issuer but only on theory. In

practice investors will experience a loss in interest income or redemption amount or even both, depending on restructuring type.

After the Global financial crisis of 2007-2008 the market has shifted its focus in more efficient pricing of default risk and especially in pricing the Sovereign default risk, of many heavily indebted countries, including Greece among others. The subsequent result was a general widening of yield levels of many sovereigns and in many cases in levels where the traditional market channel of funding became unavailable to the State. Sovereign States were in the midst of a crisis where due to the economic downturn, fiscal consolidation was needed while public investments and services needed also a boost in order to compensate for the deterioration of private investments and consumption, and all these in an environment with higher credit spreads, less liquidity and more risk averse investors.

On the side of these, as history has shown, the private sector, and especially private banks in many countries around the world, were able in similar situations, of credit squeezes and illiquid markets, to refinance their balance sheet by the issuance of covered bond schemes, achieving market acceptability and substantially lower cost of funding, when the senior unsecured debt was prohibitively expensive for them to consider. The issuance of covered bond schemes across the globe has picked up considerably at 2009 and 2010 just after the crisis of 2007-2008 has made traditional sources of funding either too costly or unavailable to many banks.

The idea and main contribution of the present article, of using the PPP contracts as collateral or protection for financing or securing debt, in a form of Sovereign covered bond, is new, and to our knowledge does not exist up to date in a formal and market acceptable structure. However, this is somehow logical, since until recently, many countries Sovereign debt was considered risk less, and financing for the state was cheap and available, making therefore a covered bond consideration obsolete. With the recent developments in the financial markets however, things have changed considerably regarding the available sources of debt refinancing for the Sovereigns. In this context, we believe that Sovereigns entities with growing deficits and heavy burdens of public debt should consider the option, of managing their refinancing needs and their available income generating assets in a more appropriate and coordinated way, in order to achieve optimal utilization and minimum cost financing and refinancing, being at the same time able to deliver a wide range of public services and investments.

In section 2, we review the practices and usage of covered bonds from the private sector and we highlight the important benefits that arise for the issuers and investors. Also we list the obstacles that need to be addressed for a covered bond scheme in order to work in practice, and we review the recent market development of covered bonds worldwide after the Global financial crisis of 2007-2008.

Section 3 of the present article, we briefly review the available forms of PPP and the past experience on their success, as well as the modeling that is used by the states to evaluate the projects and the best bidder of the projects under consideration.

We highlight the deficiencies of the above methodology for the state, and highlight the importance of a more complete pricing model for PPP projects that is close to market practices and makes the whole contract more tradable and transparent in terms of efficient pricing and risk.

In section 4, considering the above, we propose ways that the notion of sovereign covered bond can be utilized in order to match the need for public investments and services with the availability of real assets in the Sovereign portfolio, and the restrictions of sovereign funding due to possible debt burden.

In Section 5 we derive a general framework in which the State should consider the use of its real assets portfolio as collateral for debt servicing and the enhancement of public services provision, in order to achieve a range of multiple targets simultaneously.

Section 6 concludes the article and proposes actions that can lead to the implementation of the above framework.

2. Covered Bonds Primer

Covered bonds, are debt instruments issued by financial institutions, collateralized by pools of mortgages or public debt or shipping mortgages that remain on the balance sheet of the issuer, in contrast to CDO's or ABS where usually the collateral assets are transferred off the balance sheet, to an SPV. They are usually long term bullet amortizing bonds paying an annual fixed coupon.

As debt instruments they first appeared in Prussia more than 200 years ago as "Pfandbriefs". Under this name, today they are issued in Germany, the most liquid and biggest market in the world until recently. (Bujalance, Ferreira 2010). In more general terms, covered bonds are on balance sheet, asset backed bank funding instruments. The term covered bond has no legal protection or status.

The most common features of covered bonds that are of value to prospective investors are:

- Preferential claim of the investors against a dedicated pool of collateral (cover pool) or its proceeds. In the event of insolvency of the issuer, covered bond holders have privileged position, as seizure and foreclosure of collateral in the cover pool may only occur to meet their claims.

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- Full recourse to the sponsor bank (issuer). As long as the issuer is a going concern, the bonds are direct obligations of this issuer (sponsor bank) and coupon and redemption payments are met by its operating cash flows. Covered bonds however have a dual recourse, meaning recourse both to the cover pool and the issuer, if the funds realized from the collateral in the cover pool are insufficient to meet their claims in full. With any unsatisfied claims (not covered by the cover pool of assets), covered bond investors usually rank at least on an equal footing with senior unsecured debt holders, against the total assets portfolio of the issuer.
 - Revolving/dynamic pool of assets. An issuer is legally required to keep (manage) the quality and size of the cover pool even if the quality of the overall balance sheet deteriorates. As long as covered bonds are outstanding the value of the pool must be able to meet the covered bondholders' claims.
 - Covered bonds do not necessarily accelerate upon insolvency of the sponsor bank (issuer) but continue to make payments until their maturity. Covered bonds are usually not affected by the opening of insolvency proceedings in respect of an issuer's assets. Therefore they do not accelerate provided there is no default or over-indebtedness of the cover pool in question.
 - Based on the above, in most legal frameworks of covered bonds, investors benefit from the "dual recourse" to the cover pool and the assets of the sponsor bank (issuer). The way in which such a dual recourse is achieved in practice is the main point of differentiation between products and can result in a variety of structures and legal frameworks.
 - The main benefits of the covered bonds to the investors relative to senior unsecured bonds of the same issuer (therefore of higher credit quality), include the less risky (dual recourse) nature of the covered bonds (yet even though many covered bonds issues are rated as AAA, they have much higher yields compared to AAA sovereign unsecured bonds), the possibility of less required regulatory capital (Basel III accord provision), favorable eligibility criteria, enhanced liquidity in stressed market conditions.
 - According to Credit Agricole Covered bonds – senior analyzer (5/9/2011), summing it all together, the main factors that should influence the relationship between senior unsecured and covered bonds spread level of an issuer are:
 - Quality of the issuer. The worse the issuer, the bigger the difference between senior unsecured and covered bond yields should be.
 - Quality of the covered bond framework. The better the covered bond framework, the more delinked a covered bond is from the issuer and the bigger the yield difference should be.
 - Quality of the collateral. The better the collateral backing the covered bonds, the lower the probability of having to rely on recoveries from the bank's general insolvency estate, the higher the yield difference should be.

After the global financial crisis of 2007-2008, the covered bonds market has experienced an unprecedented expansion, internationally both in terms of volume and in terms of number of different issuers entering the market.

Growth in benchmark volume was accompanied by ongoing globalization of the covered bond market. Increasing issuance activity from the Canadian Banks and first time issuance from the Asian Pacific region as well as planned issuance from Australia are signs of an important growth of covered bond issuance outside Europe, which has traditionally been the most active and robust covered bonds market. As the above market growth comes mostly from banking institutions, it is partially linked to the decreasing probability of public sector support for banks and the re-pricing of senior unsecured debt.

More precisely, the growing spread differentiation between covered bonds and senior unsecured bonds has increased the appeal of covered bonds to issuers as the potential to lower funding costs has increased. In the meanwhile, a large number of countries around the world have started to implement bank resolution regimes. These regimes (bail in regimes) aim to help regulators to deal more efficiently with failing banks while minimizing the potential impact on the tax payer.

In certain cases this means that unsecured bond holders might have to share some of the burden of restructuring through haircuts on their claims. This growing concern, has led many investors to shift their focus more towards covered bonds, therefore creating significant additional demand for covered bonds. Also, demand for covered bonds is further supported by preferential regulatory treatment that covered bonds are to receive under BASLE 3 and Solvency II.

Figures 1, 2 and 3 below depict facts about the growth and issuance in the covered bonds market until recently

Figure 1

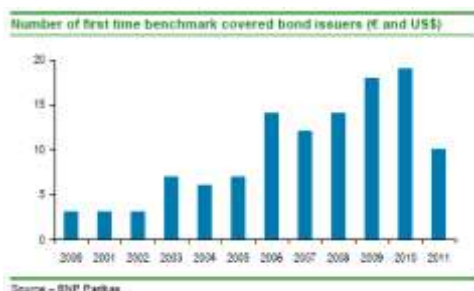


Figure 2

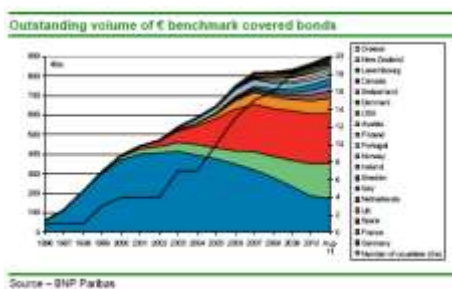
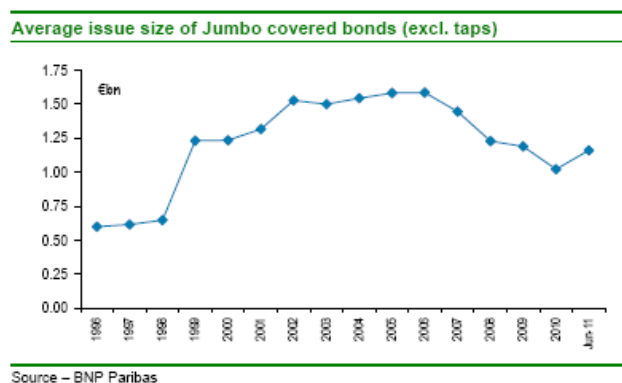


Figure 3



As for the rating methodologies that are used for covered bonds, these differ substantially in their approach between the three rating companies, S&P, FITCH, Moody's, but result more or less to a very close final rating grade for the covered bond under consideration. (Poulain 2003), (ECBC 9/2010)

However in all cases, the final notch upgrade from the issuers credit rating is substantial, and can vary from 2 to 7 notches higher depending on the treatment of the important issues in question for the covered bonds, especially the quality of the cover pool, the legal and regulatory framework, asset–liability mismatches, overcollateralization amounts, discontinuity of payments under insolvency of the issuer, etc.

Also the relevant literature only recently has emerged with ideas to appropriately price the instruments available and the relevant citations are scarce and mostly by market participant researchers in large banks. (Kenyon 2009). The E.U. allows for cover bonds to qualify for a reduced risk weighting if they meet certain criteria as set out by the European Capital Requirements Directive (CRD) of June 2006. Also BASLE III will contain specific provisions for covered bonds, and CRD IV draft of July 2011 also has a much more detailed framework to enhance the use and credibility of the covered bond market in E.U. (Langer 2011).

With regard to the above facts, we see that the concept of covered bonds, long used in financial market with varying specifications, is to receive a further boost after recent developments in the financial markets, mostly as a cheaper way of banks to refinance their activities. Legal frameworks exist, with varying success worldwide and the market is very familiar with the concept of this instrument. Also it is not by

chance that covered bonds historically were used as alternative ways of financing in times of crisis and funding constrained markets. (Packer, Stever, Upper 2007)².

Our proposal for a Sovereign covered bond scheme, is an extension of the existing market framework in order to meet a growing problem of many sovereign entities across Europe and the rest of the world that is, of refinancing their obligations at affordable levels, and at the same time mobilizing market wise their asset portfolio to their full potential. The adequate experience and appropriate national legislation regarding PPP contracts exist in many countries, and also the legislation to regulate issuance of covered bonds by banks.

It remains therefore to the state to adequately meet the necessary requirements of the market, with appropriate regulation and pricing mechanisms that respond to the way that the actual market prices and trades collateralized obligations, especially per asset type. By offering through viable debt instruments the appropriate mix of risk and yield depending on the assets in its portfolio, the sovereign entity can achieve to a varying degree a wide range of its macroeconomic goals.

3. PPP Existing Methodology

Traditionally public sector was responsible for providing public goods and infrastructure to the society based on the fact that the state is the owner of the assets and the responsible party for the procurement of wide range of public goods. During the last decades the role of the State has been changed as many governments have implemented structural reforms and instead of owning the asset or services, public sector is becoming the designer of the services that will be provided in cooperation with the private sector. Fundamental condition for PPPs success is the risk sharing. Risk is transferred between involve parties according to who can manage the specific risk more efficient. The implementation of Public Private Partnership schemes between the public authorities and the private sector appears to be an effective and sufficient solution related to the maximum utilization of the assets belonging to the state. It can be applied both to large scale projects but also to smaller and less significant for the country's economy.

The aim of adopting PPP scheme is to ensure value for money (VFM) both for the cost and the quality of the services provided to the society compared with those provided under the traditional method where public agencies are responsible for financing, construction and operation of the projects. The VFM is achieved through the efficient allocation of business risk from the public sector to the private partner

² A great amount of information and related topics on the European covered bond market can be found on the site : <http://ecbc.hypo.org/Content/Default.asp>

in the areas where the private sector is able to manage this risk better either due to its efficient structure or to its previous professional experience.

PPPs can be applied not only to new infrastructure developments but also to existing projects or to real estate assets (office buildings, conference halls, stadiums, real estate assets, marinas, ports etc) belonging to public sector. Under this scenario governments have the ability not only to receive an income from the disposal of these assets under a PPP scheme (concession, long term lease, sale and lease back etc) to the private sector but also to avoid the necessary investment and spending for the maintenance and capital improvements of the assets that usually affects budget and balance sheet.

By implementing PPP schemes for existing assets and infrastructures belonging to the government the state can receive from the private partner (operator of the project) a steady income during the entire contractual period which can be 30 years or even more. Therefore the asset automatically is converted to an income generating property for the public sector under a specific PPP contract with the private entity. This investment product can be evaluated with the conventional "Income Approach" applied to assess income-producing illiquid assets (stocks of private companies in industries not quoted on public exchanges, intangible assets, income-producing specialized real property etc).

The scenario of providing as collaterals PPP contracts in order to structure special form of sovereign covered bonds issued by the government is currently under consideration by governments, investors, financial institutions etc. The entire process can be considered having three major discrete parts. The first part involves issues purely related to the covered bonds. The experience in covered bonds is wide especially in western markets, since financial institutions have been implemented structure bonds collateralized by pools of public debt, housing or shipping mortgages. The second part involves the mechanism of structuring PPP projects where the experience is also significant especially into developed countries since they have been applied many decades ago. The final and the most important step is how PPP contracts can be used by governmental authorities in order to provide sufficient structured covered bonds.

PPP projects and contracts can be classified according to various parameters however one of the most significant is the nature of the revenues from the operation of the facility. Revenues can be paid either by the end user of the services (ie tolls for roads, mooring fees for marinas or ports etc) or by the state (when it is buying services in hospitals, prisons etc) or from both.

Since the underlying asset to the covered bond will be a PPP project/contract, the type of the contract (and hence the nature of the cooperation between the public

sector and the private entities) is the driving factor. Projects implemented under Private Finance Initiative (PFI) schemes where the public sector does not participate in the shareholding structure of the SPV developing and operating the project (infrastructure or asset) but only pays to the private entity for services sold to the public sector, cannot be considered as collateral since there are not any revenues generated for the government but only expenses during the life of the project.

Similar to pools of public debt, housing mortgages and shipping loans the covered bonds should be linked with PPP projects that their future stream of revenues for the state is defined from the outset and are able to cover bondholders' claim. Although each project developed under a PPP scheme will always have the risk of under – performance or default this is a risk that can be evaluated by the bondholder, but in order to evaluate each project as an income generating product for the state it is important to know the future revenues.

Projects that meet the above requirements related to the best possible knowledge of the future income for the state are those known as concession projects and especially the leasehold concession projects applied mainly to existing infrastructure belonging to the state such as ports and container terminals (Wiegman B. 2002), marinas, governmental buildings, stadiums, land plots etc. The private sector undertakes to construct or renovate and operate the infrastructure or the asset for a specific time period providing remuneration to the state under a specific concession agreement. The agreement can last 30 years or even more and after its expiration the asset returns to the state. Usually the compensation to the public sector is being paid on a yearly basis while at the signing of the agreement a lump sum fee can be applied.

The agreement defines the yearly fee as well as its adjustments during the contractual period. Depending on the contract and the nature of the project, the ownership of the underlying asset either remains to the government or the private operator typically becomes the legal owner for the period of the operating contract. If the government continues to bear the risk normally associated with the ownership, it is in this effect the economic owner of the asset (IMF, 2004). When considering PPP contracts that generate a steady income for the state, during the projects' period, to be used as collaterals for governmental bonds it does not imply any liquidation of the asset or privatization through transfer of the ownership to the bondholder. Projects generating income for the state have an added value that derives from the PPP agreement with the private partner. This agreement is the factor that converts the assets from typical properties to investment products that can be evaluated by investors. These PPP agreements can be assigned from the state (issuer) to the bondholder as a securitization of the provided debt.

Under this scenario the holder mitigates his risk since he has additional different collateral from a private entity that operates the asset, and this should be taken into consideration when pricing the bond and calculating the cost of borrowing. Annual fixed coupons can be related with the annual inflows for the state under the existing PPP agreements. In essence government can capitalize today future expected inflows at a better discount rate.

In order for the PPP agreements to be considered as strong and efficient collateral some fundamental parameters and procedures should be followed, similar to those when the underlying asset are other collaterals (such as public debt, housing or shipping mortgages):

Pool of assets. Governmental authorities should establish a pool of existing assets generating revenues for the state under PPP agreements that can be provided as collateral to cover bonds. Significant importance must be given to the diversification and differentiation of the projects in order to mitigate the damages/risk from a default of a specific sector. For example if we consider a pool of assets containing only office buildings owned by the state and operated by private partners it is clear that a decline in the office real estate market will affect the total value of the pool significant compared with the case that also other type of assets were included in the portfolio (ie ports, marinas, stadiums, conference centers).

Efficient structure and proper monitoring of the pool containing the assets is very significant since this will define the quality of the collateral provided to cover the issued bonds by the state. PPP contract agreements should be competent developed according to the International experience and based on the directives from the EU while the government agencies should monitor and assess the progress of the project according to the contract and secure the proper fulfillment of parties' obligations.

1. Quality of the product. Valuation of the asset pool and expected cash flows should be consistent with the scheduled obligations towards bondholders. In addition projects that appear to face important problems and as a result the private partner (concessioner) deviates from his contractual obligations should not be included in the portfolio.
2. Legal and regulatory framework for PPPs. It is very important that the PPP contracts are structured based on a solid and defined legal framework in consistence with the directions of the European Union and its relevant authorities. This framework is essential for PPPs success in general regardless if they meet the criteria to be provided as collateral to cover bonds or not. Since PPP projects are developed within the environment of the real economy in incomplete markets, the existence of the relevant regulation framework appears to be significant. Regulation implies rules and politics (either new or reformation of the existing when needed) in relation

to the issues such as taxation, legislation defining PPPs, stable political willingness from the government, education and training of the state agencies that are involved in the implementation of PPPs, control over the bureaucratic procedures within the state authorities.

3. Legal framework for defining the pool. The relevant legislation should be established in order all the aforementioned assets to be consolidated into a portfolio (most probably to an SPV belonging to the state). Legislation should provide solutions related to the ability of the SPV to assign to bondholders the PPP agreements in order to connect entirely or partially the coupons of the covered bond (fixed and optionally component) to the assets' utilization (income). The portfolio of the assets should be structured in a way that it could be rebalanced either by including more governmental assets that are utilized by PPP schemes or excluding those that either are performing far below expectations or those whose the contractual period is expired and its operation is transferred back to the owner (state).

Efficient structure of the assets pool that will be provided as collateral to cover government bonds is the parameter that finally will be evaluated from bond holders. The higher the quality of the pool the lower is the risk for the bond holders and as a consequence this will be depicted into the cost of borrowing for the state.

4. Use of PPP as Collateral Pool on Sovereign Covered Bonds

Taking into account the limitations and the different structures of possible qualified state assets to be considered as collateral, we propose mainly two distinct schemes that can be used by the state to achieve a variety of targets as mentioned in earlier chapter.

The first and most simple possible use of proceeds of correctly priced P.P.P. agreements, is to repay interest and capital to existing Public debt. Very useful and important to the state, if the above scheme is used, is to match the cash flow profile of the existing bond issues, or prospective ones, with the cash flow profile expected from the P.P.P. contracts. This will eliminate any cash flow mismatching and will make the debt scheduling of the state more controllable and manageable.

The marketing and monitoring of revenues of existing and prospective P.P.P. contracts and their cash flows, received or to be received will have a positive impact on the market of existing bond issues. Under this scheme, the private sector runs the business risk, and government utilizes the knowhow of the private sector to mobilize revenues from very large illiquid assets that cannot be sold (airports, highways, bridges, marinas, ports, etc.), and also the final ownership of the asset will remain to the state.

Instead of the state running balance deficits to finance and maintain such infrastructures, the state appropriately structures and prices their economic value and cash flows, and provides the private sector with the initiative to run efficiently previous state monopolies with private sector market standards, while the state assigns itself the role of regulator and manager of valuable economic assets.

In theory partly matching the refinancing needs of the state with cash flows expected by such PPP projects, is a logical goal for the Sovereign welfare.³

The second proposed scheme, is the issuance of sovereign covered bonds, secured by the proceeds and assets managed from and leased to the private company that will run the P.P.P. contract linked to the specific bond issuance. This scheme of Sovereign covered bonds, is potentially a less risky investment than the senior unsecured debt of a sovereign entity, expected therefore to have a smaller yield than the corresponding senior unsecured bonds of the state.

Depending on the legal and regulatory framework (controlled and forced by the state), these sovereign covered bond structures can actually have a very different underlying entity risk than the state itself, if the appropriate framework segregates the sovereign default risk from the default risk of the bond structure.

In this framework, a correctly over-collateralized portfolio of many liquid State assets, managed by private enterprises, where by the coupons of the bonds are linked entirely or partially (fixed and optionality component) to the annual proceeds of the asset's utilization, will be priced at more favorable levels than an outright unsecured issue.

Also in case of issuer (Sovereign) default the bonds will continue to run their payments until maturity, or in case of bonds default due to private enterprise risk, the bond holders are compensated either by management of the asset by new private operator or even in some cases by liquidation or ownership of the underlying assets portfolio. However when a pool of assets has been established then the underperformance of a project that might affect the payment from the private operator to the state can be eliminated by rebalancing the pool and substitute the problematic project with some other of equal value for the state. With the approach the risk for the bond holders related to the performance of some projects provided as collaterals can be eliminated.

Alternatively, the sovereign is responsible for finding a new enterprise to run the business in a more viable business level, paying the fixed amount of the coupon

³ Though the state had historically very poor capability of setting quality standards for state produced services and products, through regulatory practices in PPP projects, it can actually buy this quality from the private sector, and assign the regulatory role to the state regarding the delivery of such qualitative characteristics in the PPP projects.

until then. In all cases, the bonds framework provisions are targeted towards segregating the risk of the bonds to the risk of the sovereign and ensuring that in any case the bonds continue to yield their expected cash flows to the holders until maturity.

In these schemes, business risk is run by the private enterprise operating the assets, while the Sovereign bears the risk of losing the ownership of the assets portfolio, therefore giving an advantage to the possible bond holders, compensated for the risks they take (market risk, business risk, liquidity risk, default risk) appropriately. Also, the above structure, provide the bondholders with the alternative to get exposure to risks and specific assets that previously were unattainable to them directly.

In all cases, prospective bondholders switch their risk focus from the state to the business risk credibility of the company running the asset portfolio and to the quality and fair value of the underlying asset portfolio, making the whole bond structure more liquid and changing its risk profile substantially away from the traditional Sovereign risk.

5. Pricing and Marketing PPP Projects, Meeting the Multiple Targets of the Sovereign Balance Sheet

By implementing PPP schemes for existing assets and infrastructures belonging to the government (real estate assets, marinas, ports etc) the state can receive from the private partner (operator of the project) a steady income during the entire contractual period.

Therefore the asset automatically is converted to an income generating property for the public sector under a specific PPP contract with the private entity. This investment product can be evaluated with the conventional "Income Approach" applied to assess income-producing illiquid assets (stocks of private companies in industries not quoted on public exchanges, intangible assets, income-producing specialized real property etc).

This estimate is developed in the income approach by capitalizing the projected net income at a rate commensurate with investment risks inherent to the ownership of the property or the generated income. Such a conversion of income considers competitive returns offered by alternate investment opportunities. When properly applied, this approach is generally considered to provide a reliable indication of value for income generating properties.

Typically basic inputs and assumptions that need to be estimated to arrive at a value indication using DCF calculations are:

- holding/projection period, at the end of which the income is deemed stabilized generated income, taking into consideration the terms provided under the agreement between the owner of the asset (public sector) and the operator (private entity)
- reversionary value, present value of the asset at the end of the projected period
- discount and overall capitalization rates, applicable to the income stream and the reversionary value.

In more detail, the existing model by which the Public sector prices and assesses the economic value of an established or prospective PPP project is the following:

$$P.V. = A \cdot f + \frac{k_1}{(1+r)} + \left(\frac{\sum_{j=1}^{n-1} k_{1+j} \cdot I}{(1+r)^{1+j}} \right) \quad (1)$$

P.V. = Best price of bidder

A = Upfront amount

f = Weight factor of upfront amount

K= Fixed annual payment

N= Number of PPP life years

R= Fixed interest rate

I= Fixed inflation rate

The above existing model for choosing the preferred bidder of PPP (concession) projects, is incomplete and very simplistic from a market point of view, and it does not relate to the actual expected cash flows of the PPP project, or the existing economic fundamentals, such as interest rates curve, inflation expectations and borrowing costs for Sovereign and Private company.

Also, the model does not in any way take into account, the risk of the expectation (present value dynamics), or provisions in any way to calculate it, deviating considerably from standard market practices. It assumes an irrational upfront payment amount to the state weighted by a factor chosen separately and independently for each PPP project, and discounts the fixed annual payments (adjusted each year by an arbitrarily fixed inflation amount) to a fixed interest rate chosen depending on the project under consideration.

Also the residual value of the project after the end of life of the PPP contract is not taken into account, not even as a rough estimation. In the above setting, the preferred bidder has a rationale to place a bid in such a way that conforms to the most crucial factors affecting the present value of the project, in order to make it as large as possible.

However, the sole number of net present value is very poor to describe a financial cash flows structure of such a complexity affected by many correlated risk factors, spanning usually for over 25 years. In order to bring this model and its assumption closer to market practices and to consider it as pricing mechanism for collateral for Sovereign PPP covered bonds, and to make these bonds acceptable in the market, major modifications have to be made.

In this process, first there is the need to price the project in line with actual market expectations, and secondly, when this is achieved, to include it as collateral to covered bonds schemes and accordingly price the covered bond with collateral the correctly priced PPP in question. However the above two steps are very much connected to each other, and in many cases depending on the final bond structure they are one and identical procedure.

The general framework for pricing any type of contingent claims as bond structures, with optionality included in the coupon structure is the following, making an adjustment for a possible upfront amount to have in to consideration the existing practice for choosing the preferred bidder on PPP projects.

$$V_0 = A \cdot H + \sum_{i=1}^n \frac{k_i \cdot I_i \cdot O_i}{(1 + r_i - q_i)^T} + \frac{F_n \cdot O_i}{(1 + r_i - q_i)^T} \quad (2)$$

V_0 = Net present value

A = possible upfront payment

H = Upfront weight factor

K = fixed annual payments

I = annual adjustment index (Inflation, interest rates, etc.)

O = annual optionality index linked to quantitative or qualitative project parameters

R = market risk free interest rate plus credit spread of issuer country

Q = credit enhancement due to quality of underlying asset pool, over-collateralization, legal framework, credibility of the private property manager, credit rating up pick from better bond structure, or project specific cash flow risk.

F= final residual value of the collateral asset, possibly amortized during the life of the project, or evaluated meeting certain qualitative criteria (depending on needs of public sector).

The above model or equation, is namely a present value of future expected cash flows, discounted at an appropriate rate of return being the present borrowing cost of the bond issuer (risk free rate plus credit spread), and adjusted possibly by favorable collateral and legal frameworks, making the discount rate lower and the present value of the project higher.

The risk factors of the above model (i.e. its dynamics in a “continuous time” framework) in the more specific setting of a covered bonds secured by PPP agreements (underlying assets pool and expected cash flows), would be as follows:

$$dV_0 = -\frac{dV}{dr} - \frac{d^2V}{drdq} + \frac{dV}{dq} + \frac{dV}{dk} + \frac{dV}{dI} + \frac{dV}{dF} + \frac{dV}{dO} \quad (3)$$

The state, has the moderate control of most of the numerator variables in equation (2), such as the annual fixed payments, any residual value to be expected, or any adjustment or optionality elements to the annual cash flows, and increasing them will potentially make the market price (present value) of the bond higher.

As we see in equation (3) all the variables that connect to the cash flow component increase the present value of such a structure as is expected, and the Issuer (i.e. the State) has the option to adjust the final structure of each project in order to achieve a present value that is accepted by market standards, such as the fixed amount of cash flows, any adjustment index (inflation, interest rates level, annual total profits of SPV managing the assets etc.), or optionality components (contract provisions that enable the state to renegotiate terms of the contract in the future depending on project and market parameter values), aside from the fixed annual payments, and the final residual value.

We also see that the dynamics of such a bond structure do not depend at all from the initial upfront payment, which in our view is an obstacle to any private company considering the bidding of PPP projects, since it requires the upfront commitment of cash amounts without any immediate risk reward. We believe that from an asset liability management perspective the requirement of an upfront fee from the private company that is bidding the PPP agreement to the state, is irrational and distorts the overall bond structure and prospects of future expected cash flows, while it deliberately favors bidders that can place this upfront amount, not weighting

appropriately the future cash flows to the state, or the risks associated with the final bond structure.

In any relevant bond structure there is no provision for such an amount and in order for the PPP covered bonds to be accepted and viable in market conditions, this amount should be excluded initially and if necessary for the state, to structure it and amortize or accredit it accordingly to the overall bond structure. However the key components that will make a large difference to the pricing of the above structure are the denominators values, the interest rate and the possible credit enhancement mechanism included in the covered bond structure.

Due to market conditions and specific Sovereign limitations, the market can adjust the Sovereign specific interest rates through appropriate levels of credit spreads, a variable that is not controlled by the state as well. The only way for the state in a difficult situation such as many Sovereigns on the E.U. to control and lower the market accepted yield level directly (the general curve of the denominators on the above model), is through the control (by market acceptable standards) of the credit enhancement factor Q.

This in our view can be accomplished (as in the private sector banks) by providing extra security conditions to the prospective bond holders – investors. Appropriate overcollateralization of the covered bond issue is also a standard market practice used in such situations, on top of the above, as well as strong legal framework that guarantees the prospective bond holders in cases of Sovereign default.

PPP projects have these advantages to a large extent, since the management of the assets, is made through private sector standards, while at the same time, the Sovereign achieves a wide range of its objectives such as :

Issuance of debt at lower yield levels.

Utilization of state asset portfolio in more efficient and competitive way.

Mobilization of market funds and know how to different sectors of the economy.

Provision of public services more efficiently and with private sector standards.

Positive economic externalities in the areas and locations of underlying assets portfolio.

In practice, the bond structure relates part of the expected cash flows of the PPP management to coupons of the covered bond (apart from the over-collateralized feature of the underlying assets) the present value of which covered bond coupons should be lower than the total NPV expected by the PPP agreement, since part of

this present value is given as compensation to the private entity for taking on and managing the related risks.⁴

However, this bond will have better credit quality and lower discount factors of future cash flows because of the over-collateralized underlying portfolio, translating to a higher price at present. A risk correlated to the above setting is that in times of liquidity drainage and severe economic downturn, the might be difficult to find actual bidders for PPP projects initially. This risk has to be coped case by case by providing even more favorable terms in the contract for the private entity, in order to achieve a market price for the project.

6. Conclusion

In this piece of research, we propose and elaborate on the idea of using PPP projects in order to improve the debt profiling of Sovereign entities. By explaining the paradigm of covered bonds issued in the private sector we highlight the important factors affecting their success so far, and underline the obstacles that have to be addressed by the State in order for such a framework to be viable in the case of sovereign covered bond issuance.

We explain the deficiencies of the existing PPP model for the choice of the preferred bidder used by the state, and propose a more general model that is closer to market standards and can be accepted by market participants in order to link the income generating PPP portfolio of assets, to the pricing and issuance of covered bonds.

We propose two different possible uses of correctly priced PPP projects, which will help the State to repay part of its existing debt, or refinance part of it by issuing bonds acceptable in the market with more favorable rates (lower credit spread).

Also, we propose a more complete asset liability management approach for the state regarding its range of multiple targets and available resources, and we list the benefits in this setting of issuing covered bonds as proposed in this article.

The main contribution of the research lies in listing the conditions and benefits of the idea of bridging the PPP and asset side of the state, with the problematic liability side, in worsening global conditions after the financial crisis of 2008, and the subsequent Sovereign crisis we experience today. This bridge, especially in difficult market conditions, can provide liquidity with more favorable terms to the state, while giving a considerable boost in the real economy by utilizing efficiently assets of the State.

⁴ The level of this difference is correlated with the quality and the risks of the provided collateral and their appreciation by the bond holder.

Side effects of the success of such an approach as positive economic externalities are to be expected as well. Appropriate quantitative models for such a bridge exist in the market, and depend on the specific assets and market conditions under consideration.

At the bottom line, the State should be the overall manager of its assets and liabilities, speaking the language of private markets and using its knowhow in order to translate its goals efficiently into benefits for the economy. Any such linkages and options should be considered and worked upon, especially in States where the traditional channel of funding is limited or prohibited, while on the other side, considerable amount of assets remain substantially unutilized.

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