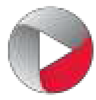

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The Public Pension Core Funding Gap and Infrastructure Public-Private Partnerships:

Identifying Potential Synergies and US Policy Responses To Improve American Infrastructure and Retirement Security

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Executive Summary

Two of the most difficult economic issues facing the United States are the relatively poor quality of American infrastructure and the funding inadequacy of many public pension plans.[1] Addressing each will require trillions of dollars and years of consistent effort at a time when public sector resources are increasingly constrained.[2] Since both public pensions and most infrastructure services are the responsibility of U.S. state and local governments, the issues will frequently interact with each other in significant ways.[3] Identifying potential synergies within such interactions can lead to more effective solutions and relatively improved outcomes.[4]

There are specific potential synergies between related aspects of the public pension funding gap and a public-private partnership (PPP) approach to financing infrastructure projects. The need to reduce the significant level of unfunded liabilities of many state and local pension plans can motivate, enable and provide capital to PPP transactions for infrastructure improvements that would not have otherwise occurred.

Federal economic policy should encourage these potential synergies where a locally positive outcome will also serve the U.S. national interest in upgrading infrastructure and improving retirement security. A practical approach to new federal policy in the current political environment can be based on relatively technical concepts that attach to existing infrastructure policy frameworks.

I. Related Aspects of Public Pensions and Infrastructure PPPs

The Core Funding Gap

Since the financial crisis of 2008, the cost and funding of U.S. public pension plans have received increased attention from direct stakeholders as well as from the national and local media. This is mainly the result of the severe effect of the crisis on public sector budgets and the value of plan assets, neither of which has fully recovered.[5] The crisis also fueled a perception of the unfairness of public pension benefits in comparison to post-crisis private-sector benefits. The scope for controversy against this background is increased by the unique and non-transparent Governmental Accounting Standards Board (GASB) accounting standards for public pensions. These standards allow for very different assessments of pension plan cost and funding to be justified from the same data.

The intense debate about public pensions involves many difficult long-term questions. It will not end anytime soon. However, the vocal controversy about many aspects of public pension plans obscures the fact that there are significant aspects that are not controversial. As a practical matter, U.S. federal economic policies designed to encourage potential synergies with infrastructure finance should be limited to non-controversial aspects of public pension plans.

The most fundamental and least controversial aspect of any defined benefit[6] pension plan is a basic core promise from a public-sector sponsor: in exchange for working in public service for limited compensation, a worker will receive a pension in retirement that reflects a proportion of that working compensation based on the actual number of years worked in the public sector. All other explicit and implicit promises made by the sponsor can be considered non-core for the purposes of this paper.

The core promise of a public pension plan is an obligation of the public sector to the worker, and it is often recognized as irrevocable with respect to past work. Public pension plan stakeholders certainly differ about non-core benefits for past work (e.g. whether a particular cost-of-living-adjustment (COLA) or overtime-related calculation is overly generous), but no credible stakeholders are suggesting that core promises made in the past should not be honored.[7] In addition, there are intense disagreements and legal challenges in many states over which public pension promises can be altered for future work and future workers, but these do not involve past work or retirees.

It is important to state explicitly that our focus on core promises here is not meant to suggest anything about the merits or validity of non-core promises. The sole intention is to identify aspects of the public pension economic challenge that appear to be a matter of settled consensus among stakeholders and are not subject to further dispute.[8]

Once the concept of a core promise is accepted as an irrevocable public-sector liability, estimating its approximate current magnitude on a present value basis is relatively straightforward in theory (if not in practice[9]). A benefit payments schedule based on the core promise can be projected using simple and conservative actuarial assumptions. The appropriate discount rate for public pension liabilities is a matter of debate, but the most analytically justifiable approach --a rate that reflects the long-term risk profile of the public-sector sponsor -- is also the most relevant for U.S. policy purposes, since it is the one used by most economists that are studying the issue.[10]

The shortfall between the present value of plan liabilities due to the core promise and the fair market value of the pension plan's assets is defined here as the 'Core Funding Gap' or CFG.[11] By definition, the amount of a public pensions plan's CFG will be smaller than the estimate of its overall funding gap (as it includes only core promises) but not by very much, since basic income-related benefit payments make up the bulk of plan liabilities. In aggregate across US state and local plans, the scale of the CFG issue is (like that of unfunded liabilities overall) almost certainly in the trillions of dollars.

The CFG has several debt-like characteristics. A pension plan's funding gap (including the CFG) can be seen as a form of long-term indebtedness where the unfunded amount of plan assets represents the 'principal' amount borrowed and future benefit payments represent 'debt service'. In this way, the CFG is similar to long-term GO bond debt issued by the public-sector sponsor, although it does not have the legal form or clarity of debt issued under a bond indenture.

In addition to its debt-like characteristics, however, a CFG has special characteristics that are unlike most other capital or private market debt instruments. These non-debt characteristics are especially important with respect to potential positive synergies between CFGs and infrastructure finance. We consider three here: moral obligation, exceptional duration and destabilizing uncertainty.

Concentrated Moral Obligation

Although the payment of unfunded core promise benefits to retirees may, in a technical financial sense, be similar to debt service payments under a GO bond indenture, the human element involved is fundamentally different. The recipients of municipal bond payments are, of course, ultimately individual people as well, but their investment exposure to a specific GO bond is highly liquid and it usually represents a small part of a highly-diversified portfolio.

In contrast, for many public sector retirees, their pensions are usually the mainstay (or even sole component[12]) of their retirement planning. Pensions are effectively illiquid and difficult to diversify. Basic benefit payments that are unfunded (e.g. those which compose the CFG) represent concentrated exposure to the credit of specific single public sector plan sponsor. This risk is often exacerbated by another factor: Public sector retirees' income and wealth levels are usually about average or even less, and, if elderly, they would have few employment prospects.

Clearly, even if the relevant legal framework does not offer special protections to this group, most people would feel that, as a matter of fairness, the unfunded core promises of a pension plan should be treated differently than other, more institutionally-oriented financial obligations of the public sector. In effect, there is an element of 'moral obligation' associated with retirees' exposure to a CFG that is not found in more straightforward long-term debt obligations of the public sector.[13]

The perception of a moral obligation associated with public pension core promises is not just an abstract principle, especially since its relevance is localized and concentrated. The retirees were, by definition, local employees; many will still live in the area, along with current public sector employees who have accrued pension benefits. This group is almost always represented by organizations that will not hesitate to take strong and direct actions to sway local public opinion. Although many non-core promises made by public pensions do not receive public sympathy, in a situation involving significant cuts or payment risk to a core promise, an appeal based on the moral aspects of the CFG obligations would be difficult to dismiss. As a pragmatic matter, this may result in some effective degree of priority or preference for such obligations even when the legal framework would seem to require parity.[14]

Exceptional Duration and Complex Payment Structure

In comparison to almost all senior bond debt, the unfunded core promises of public pension plans usually have an exceptionally long duration (i.e. the weighted average life of expected benefit payment schedule). This is due both to the long-term nature of pension obligations (usually in excess of 50 years) and the fact that payments related to CFGs are projected to be heavily skewed to the end, beginning only once the plan assets have run out.[15] In addition, although the basic schedule is relatively predictable in accordance with actuarial experience, there are additional variables to consider, including demographic developments and elements of inflation-linkage through minimal COLAs.[16]

In effect, the public sector sponsor responsible for the pension plan's CFG has issued a highly unusual debt instrument that could not be effectively replicated directly or synthetically in the capital markets. This may have a real value in the context of the public sector entity's overall liability structure, especially the extremely long duration aspect. Reducing the CFG by incurring an obligation with a shorter duration will forfeit a significant portion of this value. This is not a reason to avoid reducing a pension plan's CFG, in light of its other characteristics, but it is a cost to be considered

Destabilizing Uncertainty

Almost all public sector GO debt has a degree of certainty and clarity with respect to principal amount, payment schedule, legal character, etc. Not so for the obligation represented by a significant CFG.

The main uncertainty is that the principal amount of a CFG is defined in terms of a shortfall between plan liabilities and the value of plan assets, both of which are variable. Plan liabilities (especially core promises) are not likely to change suddenly, but as public pension funds have increasingly relied on equity investments, the value of plan assets can fall swiftly and dramatically. The 2008 financial crisis was the most recent demonstration. As many public pension funds seek higher yields in the current environment by accepting higher risk[17], the volatility of plan assets will continue to increase – as will the chance of a large and sudden increase in the CFG.

A subtler type of uncertainty arising from large CFGs is the corrosive effect on the public sector sponsor's political capital over the long term. GO bond debt that has been issued in public capital markets is not possible to hide and is necessary to pay on a fixed schedule. A pension plan's CFG, however, is basically an off-balance sheet obligation and its magnitude can be obscured. In addition, CFG amortization payments are basically optional by one means or another. Stakeholders on all sides of the issue are keenly aware of these ambiguities and how to use them. The result is that *whatever* the sponsor does – whether they 'bite the bullet' (i.e. make additional pension contributions) or they 'kick the can' (i.e. allow pension obligations to accrue) – it will have a political cost. This involves political energy and capital that could be more effectively used elsewhere, and for which the opportunity-cost over years might only become apparent when it is too late.

For both of these reasons, in comparison to the equivalent amount of GO debt, a CFG introduces elements of uncertainty that can have a costly destabilizing effect on the local economy. Obviously, long-term private-sector investment favors a stable fiscal and political environment. The perception that a large local CFG could explode in magnitude or lead to endless political confrontation and maneuvering can only be detrimental with respect to local economic growth.

Infrastructure Public-Private Partnerships

A state or local public sector government might consider using a public-private partnership in order to develop or rebuild an infrastructure project for a variety of reasons. Traditional rationales for a private sector role include: improving construction efficiency and cost-effectiveness, transferring operational cost and risk, enhancing customer service, ensuring better long-term maintenance, etc. PPPs can take different forms for different purposes, but the common theme in the traditional case is a focus on improving the infrastructure asset and its operations.[18]

A public sector entity might also consider a PPP for reasons that are primarily related not to the project itself, but to its own fiscal, budgetary or other financial circumstances.[19] For example, a PPP transaction might allow that entity to proceed with a project that cannot be financed with GO debt, due to the difficulty of amending a statutory debt ceiling. More fundamentally, if repayment of the infrastructure project's senior debt is based primarily on non-recourse revenues (e.g. user fees) a PPP approach may help the public sector entity manage its overall debt and liability situation.[20]

PPPs and Public Pension Issues

In cases where traditional project-focused cost and efficiency factors are the primary motivations for a public-sector government entity to consider a PPP approach to an infrastructure project, the financial condition of the local public pension is not likely to be especially relevant.

In contrast, in cases where the public-sector entity is considering a PPP approach, primarily due to fiscal or budgetary issues, then the cost and funding status of the local pension plan may be an important or even central factor in the decision. This is because a significant local pension issue (e.g. a large CFG) can cause or exacerbate overall financial issues for the local public sector government, which, in turn, will limit resources available for infrastructure projects.

In effect, while traditional cost and efficiency motivations for PPPs are stand-alone in the project itself, financial motivations for PPPs derive from exogenous factors, including the condition of local pension plans. Traditional project-focused benefits are always important for a successful project in the long run, but at the development stage, binding constraints are in many cases likely to be exogenous and financial.

The financial motivations and related aspects of PPP infrastructure transactions that are most likely to be relevant to potential synergies with public pensions include the following:

- *Nature of constraints*: An important characteristic is the extent to which the government's financial constraint is related to relatively arbitrary statutory or regulatory limits (i.e. a non-credit issue), or is related to more fundamental objectives with respect to the impact of financing the infrastructure project on its overall debt management (i.e. a credit-related issue).[21]

- *Use of financing transaction proceeds*: How are the proceeds of the capital raised in the PPP being used? If all of the proceeds are being directly invested into a new infrastructure asset (i.e. a 'greenfield' project), the transaction will not raise any cash for the public-sector entity (i.e. non-monetizing). When a revenue-producing asset already exists (i.e. a 'brownfield' project), a PPP transaction that upgrades or expands the project may also be able to raise additional capital and transfer a share of the transaction's financing proceeds to that local entity (i.e. monetizing).[22]

- *Degree of recourse*: PPP transactions can be structured with different levels of recourse for revenues from the public-sector entity, ranging from long-term capacity or availability contracts (e.g. a high degree of recourse back to the entity) to a complete reliance on market-based user fees (e.g. effectively non-recourse). The degree of recourse may have implications for the public-sector entity's management of its overall debt level and credit rating.

- *Public resistance*: All types of PPP transactions are likely to encounter public criticism for a variety of reasons, but financially-motivated PPPs often face an even higher level of public resistance, especially when they include any aspect of monetization. This suggests that sources of active public support are particularly important for financially motivated PPPs, and that benefits for a wide range of stakeholders should be clearly demonstrable.[23]

II. Potential Synergies Between CFGs and PPPs

There are a variety of potential synergies between the need to address a public pension's CFG and a PPP approach to infrastructure financing. A PPP transaction can be an effective response to public sector fiscal and budgetary constraints caused by a CFG's general debt-like characteristics. Specific aspects of CFGs and PPPs can interact in ways that enable and enhance relatively positive outcomes. PPP transactions can also provide especially suitable investment opportunities for public pension plans seeking to reduce their CFG by improving the match of plan assets and long-term liabilities. Such opportunities could include investment in the public pension sponsor's own local infrastructure projects when the right circumstances arise.

PPPs and CFGs' Debt-Like Characteristics

Unfunded pension liabilities are similar to other senior indebtedness with respect to the fiscal and budgetary constraints they can impose on a state or local government. For example, amortizing a pension plan's unfunded liabilities is similar to accommodating GO bond debt service in the budget. Also, despite being an off-balance sheet obligation for accounting purposes, a public pension plan's unfunded liabilities will be included by credit-rating agencies in their assessment of overall debt and liabilities. A CFG will be the major component of such unfunded liabilities in most cases.

A high level of CFG obligations, particularly in addition to high levels of other debt and senior obligations, can impede the direct financing of local infrastructure by public sector governments. Through various contractual structures and a potential reliance on user fees, a PPP transaction can remove impediments that are somewhat arbitrary (e.g. a statutory debt limit) or even fundamental (e.g. where additional GO debt issuance might trigger a ratings action) and allow an infrastructure project to proceed. In effect, a PPP transaction is a positive response to the negative impact a CFG could otherwise have on a local public sector's infrastructure development and renewal. Some illustrations are as follows:

- A large city has committed to an increased level of annual pension contribution in order to amortize the funding gap over time, but this reduces funds available in the annual budget for new capital spending. Since reductions in either item are politically difficult, the city initiates a program of PPPs designed to mitigate the budgetary accounting impact of planned infrastructure projects.[24]

- A state government is facing possible bond downgrades due to its overall levels of indebtedness and significant CFGs among various state-level plans. In order to pursue major new transportation projects, the state considers a program of PPPs that rely mainly on user-fees.[25]

- A city faces an operating budget gap and a further debt rating downgrade, both exacerbated by a very high CFG of the local pension plan. The city pursues a monetizing PPP on its water system where the proceeds are used to close the budget gap, perform upgrades on the water system and reduce the CFG.[26]

Specific Interactions Between PPPs and CFGs

The special CFG characteristics described above can interact with possible PPP transactions in more specific – and potentially powerful – ways than the CFG's debt-like features. These potential specific synergies are especially important with respect to positive outcomes and U.S. policy responses. Five examples of specific synergies are as follows:

- *Moral obligation as enabling effect*: The concentrated moral obligation of a CFG can help overcome the inevitable resistance to a PPP transaction. A PPP can be characterized as a means by which simultaneous CFG reduction and necessary infrastructure development becomes possible even in the face of tight budgets. A focus on CFG reduction places public discussion in the context of the importance of the obligation to local public sector workers and retirees, not distant institutional bondholders.[27]

- *Credit-positive result*: In light of the potential destabilizing effects of CFG obligations in comparison to other long-term public-sector indebtedness, greater CFG reduction (e.g. by faster amortization or additional lump-sum payments to the pension plan) is likely to be considered a more credit-positive outcome than a reduction of the equivalent amount of bond debt. However, simply borrowing more senior debt through GO issuance for that purpose (e.g. a 'Pension Obligation Bond' or POB) is usually counter-productive[28] since that just replaces one

recourse obligation (the CFG) with another (the POB). Instead, a monetizing PPP that relies primarily on non-recourse user-fees and is designed to permit a significant reduction in a CFG should be more effective with respect to improving the public-sector entity's creditworthiness.

- *Long duration matching:* Infrastructure assets intrinsically have very long useful lives, and PPP operating contracts or concessions with terms of 50 years or more are not unusual.[29] In addition, due to the relatively customized nature of PPP project capitalization, the structure of such contracts often includes back-end loaded payments, inflation adjustments and flexible amortization. Since this long-term payment profile is closer than a debt market alternative to the long-term benefit payment obligations arising from pension plan unfunded liabilities, the use of a monetizing PPP to reduce a significant CFG would allow preservation of the long-duration aspect of a local government's liability structure. In addition, with regard to public acceptance of the deal, a back-end loaded PPP contract also means that user fees can ramp up slowly, even over the course of decades, and near-term increases in user fees can be minimized.

- *Tangible and intangible effects complementary*: The reduction of a local pension plan's CFG is a positive development, but it is an intangible event, and fiscal and economic benefits to the local community will not be seen in the near term. In contrast, when a PPP transaction allows an infrastructure project to proceed, there are obvious positive physical results, not the least of which is immediate employment directly and indirectly related to construction. When the two occur together (because their synergy has made each possible) their described benefits can be complementary. This is because the new PPP project will deliver visibly improved local infrastructure and jobs in the near term while the CFG reduction will benefit the local economy in the long term. The combination of short-term and long-term benefits can help persuade a wide range of skeptical voters.

- *Inherently stabilizing and growth-oriented*: The reduction of a local pension plan's unfunded liabilities or the construction of a new local infrastructure project may not automatically improve the perception of the local business climate. It can depend on how such actions are paid for. If the unfunded liabilities are reduced through deep cuts in services, or additional debt incurred to fund the infrastructure project increases the chance of a ratings downgrade, then the actions might be counter-productive with respect to trying to encourage investment. However, if synergies with a CFG enable a PPP transaction, which, in turn, permits CFG reduction with fewer service cuts, then the outlook might appear more inherently stable as well as growth-oriented. In addition, accomplishing both actions at the same time would be clear evidence of increased local consensus and political discipline, which should be a positive indicator in itself for the local economy.[30]

PPP Investment Opportunities

A standard approach to reduce a pension plan's level of unfunded liabilities is to seek a higher return on plan assets over the long run. This requires investments that combine a mix of attributes, including long principal tenor and duration, inflation-protection, and predictably high returns while also being relatively low-risk. In the current investment environment, finding this combination in a single investment is difficult.[31]

Debt and equity issued by infrastructure PPP transactions often have intrinsic characteristics that allow these investments to come close to meeting pension plan objectives. This is now well recognized by U.S. fund managers, including public pension trustees and investment officers.[32] Since most available PPP investments are not publicly traded and do not fit into existing fund allocations of fixed-income and equity, many plans have created or expanded alternative allocations in order to include private infrastructure assets. To date, most of their focus has been on infrastructure equity investments (usually through a private-equity fund) but interest is increasing in infrastructure senior and subordinated debt. Since long-term infrastructure debt is a better match than equity for most fund objectives, PPP debt investments will likely predominate in pension fund infrastructure allocations eventually.[33]

Infrastructure investments may be particularly well suited to help a public pension plan reduce its CFG over the long term. However, there are currently several significant practical limitations to sourcing infrastructure investments, especially if a fund wants to avoid emerging markets or cross-currency risks and invest primarily within the US. These include:

- *Low investable volume*: Although there has recently been considerable focus on the potential for widespread utilization of infrastructure PPPs in the US, the actual volume of transactions still remains relatively low in the context of overall infrastructure investment or need, or in comparison to PPP volume in other developed economies.[34] In addition, the infrastructure PPP investment avenue for most pension funds is currently allocated to equity instead of debt. In light of typical a PPP transaction's high leverage and low equity requirement, this allocation further reduces the available volume.

- *Relatively low risk/return*: One reason that infrastructure debt remains a minor asset class for pension fund investors is that the risk/return profile is relatively low. The credit rating level of most U.S. and European PPP project senior debt is solidly investment-grade. In the current yield environment, this means that the return on most PPP debt (while higher than many other investment-grade fixed income investments) is not sufficient to meet pension plan benchmark pricing for illiquid and complex assets.[35]

- *Tax-exempt status*: Long-term debt issued for many U.S. infrastructure projects, even when nominally done as a PPP, qualifies for tax-exemption (e.g. as Industrial Revenue Bonds, Private Activity Bonds, etc.). Tax-exempt debt is not an efficient investment for non-taxpaying U.S. pension funds.[36]

The limitations of PPP investment supply in these cases are not likely to be permanent. Increasing demand by institutional investors, but especially public pension funds facing significant CFGs, will likely prompt an increasing supply of PPP debt and equity investments that fit the correct profile. The vast amount of infrastructure financing needed in the U.S. would suggest that a large and long-lasting pipeline of transactions will develop, and that institutional investors, such as public pension funds, will be major suppliers of the necessary long-term debt and equity capital.

In particular, PPP transactions that are primarily motivated by public sector financial constraints could be a significant part of increased supply, due to their special characteristics in comparison to more traditionally-motivated PPPs. Paths by which this may develop include:

- *Many more suitable infrastructure projects*: The supply of traditionally motivated PPPs is limited by their fundamental commercial rationale. Many possible infrastructure projects will not materially benefit from a private-sector role in the physical asset's construction or operation by means of ownership or investment (as opposed to contract), especially when the project is relatively simple and the public sector has established experience in the sector (e.g. roads). In contrast, the rationale behind possible financially motivated PPPs can apply to almost any greenfield or brownfield project, since it depends on the public sector's financial situation, not the physical facts of the project. Since the U.S. state and local fiscal and budgetary situation is not likely to improve in the near-term and could worsen, financially-motivated PPPs will become more common.

- *More risk transfer, more return*: In many traditionally motivated PPPs, operating contracts with a high degree of recourse back to the public sector help lower the project's cost of capital and thereby increase the net realization of non-financial efficiencies. However, a financially motivated PPP transaction can be driven precisely by the need to *reduce* the public sector's debt-like recourse obligations. This means that relatively unconditional contractual payments to infrastructure projects (e.g. for capacity or availability) need to be minimized and project revenues must rely primarily on user fees. If a PPP project relies on user fees that have some element of market risk (e.g. tolls in a new highway lane), the transaction's debt and equity capitalization will have a higher risk level – and a commensurate higher return. The higher risk/return profile of financially motivated PPP transaction capitalization is more likely to meet pension fund benchmark pricing requirements while still remaining within conservative credit parameters. This can provide a more effective long-term investment for CFG reduction than the lower risk profile of traditionally motivated PPPs.

- *Tax-exempt market is less cost-effective*: Traditionally motivated PPPs often have a relatively straightforward debt capital structure, since the focus of the transaction is on physical and commercial efficiencies, not credit risk transfer or financial objectives. If the project is eligible to issue tax-exempt debt, a simple revenue bond can then be efficiently structured and placed in

the U.S. municipal debt market. In contrast, financially motivated PPP projects may have a quite complicated capitalization structure due to higher risk transfer and other objectives (e.g. inflation-linked revenues or back-end loaded user fees). Even if eligible, a tax-exempt issue may not be especially cost-effective for the issuer if the PPP debt instrument is complicated. In many cases, a syndicated project finance loan done on a taxable basis, which can include pension funds as lenders, might be a better avenue for placement.[37]

Direct Bilateral Transactions

As described above, a significant CFG might motivate and enable a PPP transaction. In addition, a PPP transaction might be an effective investment for a public pension plan seeking to reduce a CFG over time. These observations suggest an obvious question: Should a local public pension with a CFG invest directly in a local infrastructure project PPP transaction on a bilateral basis?

The threshold limitation to a bilateral direct transaction is the need for the facts and circumstances to line up generally, which will not occur frequently. For example, a local public pension plan's CFG might have caused or enabled a particular local PPP project, but that specific plan might not yet be permitted to make private infrastructure investments of any kind. Alternatively, a plan's trustee may have approved an infrastructure investment allocation, primarily due to a CFG, but there is no local need for a major infrastructure investment in the near future.

If and when the facts do align, is a bilateral direct deal likely to occur? There would appear to be significant benefits to this approach. The primary benefit is in avoiding the transaction costs and constraints of market-based deals, both with respect to placing the PPP's capitalization and to sourcing PPP investments by the pension plan. If a local pension plan is seeking an infrastructure investment, and a local PPP transaction is seeking an investor, a market would not appear to serve any useful function if the facts and circumstances permit a direct bilateral deal.

In a direct bilateral transaction, public support for the PPP project can be encouraged by pointing out that the project's capitalization is locally owned, and that project user fees are now traceable (through CFG reduction) to local public-sector workers and retirees. There are no faceless bondholders or profiteering outside investors. Instead, public discussion is focused on how the transaction will improve local infrastructure while also reducing the concentrated moral obligation associated with a local CFG.

In addition, since in a direct bilateral transaction investment returns on the PPP's capitalization are earned by the local pension plan, it may be possible to translate transaction cost savings and broader public support into relatively high yields on that capitalization, which, in turn, could be used for greater CFG reduction. To the extent that such yields required higher infrastructure asset user fees, a back-loaded schedule that minimized near-term fee increases could be a politically practical approach that also works wells with the long-term nature of PPP capitalization.

Notwithstanding possible benefits, however, many possible bilateral direct transactions are likely to encounter a serious roadblock with respect to pension plan portfolio concentration risk. The scale of capitalization of most infrastructure projects would represent a relatively significant percentage of even a large public pension plan's assets. Also, from the retirees' perspective, a bilateral deal may not significantly improve risk exposure to the local economy relative to their exposure through an unfunded obligation.

To avoid excessive concentration risk, the plan could simply buy an appropriately sized share of the project's capitalization on a direct basis, possibly with some savings and scope for customization. Since the bulk of the PPP's capitalization would need to go through the usual market-based routes, however, much of the benefit would be lost.[38]

There are two other paths by which the portfolio concentration risk of a direct and exclusive bilateral transaction can be reduced to an acceptable level. The first is simply to limit the size of infrastructure projects involved in bilateral transactions to less than the maximum investment size specified by the plan's portfolio diversification guidelines. This will result in small assets and correspondingly small benefits.

The other is to reduce the portfolio concentration by selling down the exposure on a larger deal to the guideline target through a secondary transaction simultaneously with (or soon after) completing the primary PPP transaction. This could be done on a direct assignment basis, but a more efficient approach would be the sale of non-direct participations where the plan remains the only direct investor, with secondary participants being behind the scenes. Regardless of the legal form of such secondary transactions, developing a market for secondary PPP debt would increase liquidity and availability of suitable infrastructure investments for public pension plans, which is itself an important objective.[39]

III. Practical U.S. Policy Responses

Since both U.S. infrastructure quality and retirement security for Americans are matters of U.S. national interest, federal economic policy should consider potential synergies between these two economic challenges when relatively positive outcomes appear possible.[40]

As a practical matter, policy approaches to potential synergies need to start with the infrastructure side of the equation. There is an increasing amount of advocacy from a broad base[41] of important stakeholders for expanded U.S. federal support for infrastructure investment and renewal. Despite Washington's current polarized political environment, there also appears to be broad bipartisan receptivity[42] to this support, especially for innovative approaches (such as PPPs) that require less deficit spending than traditional federal infrastructure programs. Many of these new approaches are designed primarily to increase private-sector investment in infrastructure, either by revisiting federal rules and regulations or by providing federal co-investment in project capitalization.[43]

With respect to retirement security, direct U.S. federal action to mitigate state and local public pension fund issues is much more controversial, although some ideas for legislation have been proposed.[44] The merits of trying to help solve a problem that can affect so many Americans are not the main source of disagreement in this case. Rather, it is because public pension issues are intrinsically involved in a much larger debate about the role – and cost – of government at all levels, including federal. Assistance for public pensions in an indirect form that avoided such ideological questions should be less controversial, and identifying potential synergies with less contentious federal infrastructure policies may be a possible path to achieve this. The support for any approach that is politically feasible is likely to increase as the scale and implications of a public pension fund crisis become more apparent.

Defining A Positive Outcome

Since the objective of federal policy related to potential synergies would be based on possible positive outcomes, it is important to describe precisely what a positive outcome means. It is not likely that synergies between CFGs and PPPs will always result in an outcome that is better than what would have occurred if the economic challenges arising from infrastructure and pension issues had not been there in the first place. Instead, the correct baseline is the absence of synergies in situations where the two issues impose detrimental constraints on each other. Then the question becomes: How can a synergy between an existing CFG and a potential PPP reduce such constraints in the specific situation?

At the state and local level, any actual reduction in a fiscal or budgetary constraint will probably be automatically considered a positive outcome. The local government's desire to reduce constraints will likely be the main driver in utilizing the enabling features of the synergy between a CFG and a PPP. If the enabling process succeeds and leads to a desired result that would not otherwise have been possible (e.g. simultaneous reduction in the unfunded liabilities of the local public pension plan and improvement of local infrastructure), then by definition the local government's leaders – and presumably the majority of local citizens – will consider this a positive outcome.

However, for economic policy at the U.S. federal level there is an additional question to ask. Assuming that a specific synergy between an existing CFG and a potential PPP can successfully remove a local constraint, and that federal policy could encourage that synergy, will the likely outcome also serve the U.S. national interest?

This question does not have an automatic answer. It is not hard to imagine outcomes that are acceptable on a one-time basis in a particular locality but would not be acceptable if repeated nationwide for many years. For example, a city facing a budget crisis exacerbated by a significant CFG might monetize a brownfield transportation asset through a PPP concession transaction and use the proceeds to plug a short-term budget gap. There is no long-term improvement in local infrastructure, local employment or the prospects for local economic growth. Even if a synergy between the city's CFG and the PPP is what allowed the transaction to proceed, it is clear that no U.S. national interest would be served by a federal policy supporting the CFG-PPP synergy in this case.[45]

In light of local outcomes that do not serve the national interest, U.S. policies designed to encourage potential synergies between a CFG and a PPP should include clear evaluation criteria that reflect national economic priorities. The following group is based on current goals that appear to have broad bipartisan support:

- *Improving American infrastructure*: The synergy's outcome should include a measurable improvement on the relevant part of local infrastructure, either by building new greenfield assets or by upgrading or expanding existing brownfield ones. Some monetization related to the other goals of the policy (below) would be permitted, but full monetization would be excluded from the policy's scope.[46]

- *Strengthening retirement security for Americans*: The synergy's outcome should leave local public pension plans in a stronger position to pay earned-to-date benefits over the long term, especially where beneficiaries are excluded from Social Security.[47] Note that matters related to public pension reform or non-core benefits should be excluded from the policy's scope since these are inherently local and often controversial issues. In effect, the policy scope should be explicitly limited to reductions in a non-controversial CFG.

- *Increasing local employment*: The outcome should result in more local jobs, not only in the short run (i.e. related to work on the PPP infrastructure project), but also in the long run, reflecting enhanced local economic prospects through better local infrastructure and less fiscal instability in the public sector through CFG reduction.

- *Additive to U.S. national GDP*: In the short and long run, the synergy's outcome should increase local and regional economic activity and add to U.S. GDP.

Other Practical Considerations

Concepts for policies intended to encourage beneficial interactions between CFGs and PPPs should reflect two important practical considerations.

The first consideration is that the concept attaches to an existing policy framework. This effectively limits possible synergy concepts to infrastructure policy since federal policy frameworks for public pension fund issues have not been established to date. In Washington's current polarized political environment, new legislation or major statutory amendments of existing legislation for a new policy approach is not possible. As a result, synergy policy concepts should be designed and proposed as relatively minor modifications to existing economic policies related to U.S. infrastructure, especially those that already pertain to PPP transactions. Ideally, the modification should be mostly accomplished through a rule change or reinterpretation, expanded definition or other technical avenue, and it should be clearly consistent with the main objectives of the existing policy framework.[48]

The second practical consideration acknowledges that a focus on the potential synergies between infrastructure finance and public pension issues is new.[49] Policy goals need to be modest, and there should be a greater emphasis on the usefulness of observing and understanding initial results than on the expectation of significant near-term impact. For that purpose, synergy policy concepts may be proposed most effectively for inclusion in pilot programs and similar developmental sections of infrastructure policy frameworks.

Illustrative Policy Concept Examples

The Appendix to this paper outlines six policy concepts that might encourage CFG and PPP synergies that could lead to a positive outcome in accordance with the national level goals discussed above. Note that the purpose of this list is not to propose these specific policies as an optimal approach. The list is far from exhaustive, and it is likely that many other effective alternatives could be developed, especially with the benefit of additional research and feedback from stakeholders. Rather, the purpose is to show how specific policies to encourage potential synergies could be attached to various existing or legislatively proposed infrastructure policy frameworks. In effect, the six are intended as illustrative examples of policy concepts that might be realistically proposed if a synergistic approach to the infrastructure and public pension challenges is developed further.

The first three concepts attach to U.S. federal rule and regulatory frameworks that pertain to infrastructure. Their intent is to permit more potential qualified PPP transactions (i.e. those sought by state and local public sector authorities in connection with reducing a significant CFG and where the overall economic impact is positive) to proceed by selectively expanding the scope or streamlining federal approval procedures. The next three concepts attach to U.S. federal loan financing programs for large infrastructure projects, two of which are proposed in Congressional bills (at the time of writing) and one is established. In these cases, the aim is to expand the availability of debt capitalization for PPP transactions that are being done in connection with a significant reduction of a CFG.

IV. Conclusion

Identifying potential synergies between public pension and infrastructure issues can result in more effective solutions and relatively improved outcomes. This paper has outlined specific synergies between the need to address a significant CFG and a PPP approach to infrastructure finance.

Since American infrastructure renewal and retirement security are matters of national interest, U.S. federal economic policy should encourage potential synergies that have a locally positive outcome when the national interest is also served. CFG-PPP synergies can form the basis of practical federal policy development through the attachment of relatively technical concepts to existing infrastructure policy frameworks.

Possible next steps for the development of a practical policy approach should be directed towards building basic foundations, including the following near-term actions:

- *Survey of stakeholders*: The primary stakeholders in the infrastructure and pension fund economic issues are not difficult to identify. In most cases, they are elected officials, public sector policymakers, or well-organized and sophisticated groups. It is possible to design and implement surveys that elicit real-world data and practical considerations about possible interactions.

- *Develop an assessment methodology*: The theoretical groundwork for an analytical methodology designed to assess possible positive outcomes can be developed prior to the need for its application to specific policy. The purpose of this early stage work would be to demonstrate that proposed policies concerning interactions can be tightly assessed and controlled.[50]

- *Additional policy concepts*: Infrastructure and public pension challenges are now increasingly recognized as major issues that require new and innovative approaches. Policy ideas are being constantly developed for both challenges, but usually on a separate basis. The potential synergies between the two can and should become an active part of this broader discussion.

About the Author

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Appendix

1. Interstate Tolling for Reconstruction

Objective	To expand the scope for tolling local stretches of Interstate highways through PPP transactions for the purpose of (1) highway reconstruction and/or expansion and (2) CFG reduction.
Attachment Framework; Specific Provision	Interstate System Reconstruction and Rehabilitation Pilot Program (ISRRPP) authorized under Section 1216(b) of TEA-21; Limitation to three slots (already allocated)[51]
Policy Concept	While projects proposed to date under the ISRRPP have not proceeded, due to local resistance to newly imposed tolls, this factor might be significantly lessened in cases where there is an interaction with a local public pension plan needing to reduce its CFG. In anticipation of this, the policy concept is to add a certain number of "special slots" (perhaps three) that would allow additional applications to the program for proposed PPPs that were connected to local CFG reduction. Note that this policy concept would not seek to change the basic prohibition against monetization under the ISRRPP (i.e. all financing proceeds must be used on the reconstruction project itself). It seems clear that the ISRRPP is a specific policy framework for infrastructure asset improvement, not for general economic policy purposes.[52] CFG reduction would need to occur through additional fiscal or budgetary capacity made possible by the PPP and improved local economic conditions.

2. Airport Privatization Proceeds

Objective	To expand the flexibility to increase private-sector investment through a PPP transaction in major commercial airports owned by state and local governments for the purpose of (1) facilities upgrades and (2) CFG reduction.
Attachment Framework; Specific Provision	Federal Aviation Administration's Airport Privatization Pilot Program (USC Title 49); Requirement for 65% approval from airlines serving an airport to use sale or lease proceeds for non-airport purposes.[53]
Policy Concept	The requirement of airline approval is seen as a limiting factor for state and local governments seeking at least a partial monetization of their existing major airports.[54] While this requirement is understandable in many cases, given the stake airlines have in airport use and operations, if the local public sector is facing fiscal constraints, and a reduction of a significant local pension plan CFG would improve the local economic prospects (thereby increasing airport traffic and flight volume), then the FAA should have the ability to override or modify the approval level when the net proceeds are used exclusively for CFG reduction.

3. Federal Fast-Track Permitting and Approval

Objective

Allow PPP transactions to benefit from fast track or streamlined federal approvals with additional consideration in terms of priority or approval when there is CFG reduction related to the transaction.

Attachment Framework;

Specific Provision

Presidential Memorandum "Speeding Infrastructure Development through More Efficient and Effective Permitting and Environmental Review" (August 31, 2011); Project selection criteria[55]

Policy Concept

It is well recognized that federal permits and required approvals can slow and discourage greenfield project development, the mitigation of which is, of course, the purpose of the presidential memo. Since there is likely to be a correlation between a higher need for more immediate infrastructure improvement (for both local economic development and local employment) and the existence of a significant CFG at the local public pension plan, a special priority should be given to fast-track applications that seek to develop PPP transactions which permit CFG reduction.

4. Brownfield Refinancing Loan Support

Objective	Provide federal infrastructure loan support to proposed brownfield PPP transactions where (1) there is a significant improvement or expansion of the brownfield infrastructure asset and (2) any additional net proceeds are dedicated to local CFG reduction.
Attachment Framework; ***Specific Provision***	S.1716 (proposed November 2013) "Building and Renewing Infrastructure for Development and Growth in Employment Act'' (BRIDGE Act); Section 201(a)(2)(A)(i) (i.e. eligible transaction "is not for the refinancing of an existing infrastructure project")[56]
Policy Concept	The general intent of the anti-refinancing provision is consistent with the broader objective of improving American infrastructure while not encouraging purely financial transactions. However, in cases where a state or local government is fiscally constrained, infrastructure improvement through a brownfield PPP transaction may be more feasible if some amount of refinancing and monetization is permitted, especially if CFG reduction can be accomplished at the same time. The anti-refinancing provision should be modified to include exceptions where a PPP project creates both significant improvement of local infrastructure (thereby improving local economic prospects and employment) and any net refinancing proceeds are dedicated to CFG reduction.

5. Secondary Loan Purchases

Objective	Encourage the general development of a secondary infrastructure loan market, and specifically for public pension plans with significant CFGs that are investing in direct bilateral PPP transactions on local infrastructure assets and to reduce concentration risk.
Attachment Framework; Specific Provision	Title X of the proposed Water Resources Development Act of 2013, a pilot program, the ''Water Infrastructure Finance and Innovation Act of 2013'' (WIFIA); Section 10010 (d) "Sale of Secured Loans"[57]
Policy Concept	Local water assets are of the size and type that might allow a direct bilateral transaction between a local pension plan with a significant CFG and the local water authority's proposed PPP.[58] The pension fund will still need to lower concentration risk; if WIFIA was authorized to also buy loan participations from public pension plans (for projects that otherwise met all the eligibility requirements) for immediate resale on the secondary market, this would (1) permit a more efficient primary transaction and (2) help create more available infrastructure debt investments for other institutions, including other U.S. public pension plans. A strong secondary market will, in any case, assist U.S. infrastructure investment, especially for PPPs.

6. Credit Cost Offset for Taxable Debt Issuance

Objective

Increase the volume of available taxable debt in U.S. infrastructure projects for investment by public pension plans by offsetting some of the credit subsidy cost of a proposed PPP transaction seeking support from a federal loan program if that PPP (which is otherwise eligible to issue tax-exempt debt) is issuing federally taxable debt and the debt is bought by a public pension seeking to reduce a significant CFG.

Attachment Framework; Specific Provision

The Transportation Infrastructure Finance and Innovation Act of 1998 (TIFIA) authorized under the Transportation Equity Act for the 21st Century (TEA-21), amended in MAP-21 2012.[59]

Policy Concept

If a PPP transaction was eligible to issue tax-exempt debt but instead issues taxable debt bought by a public pension fund, federal tax revenue will ultimately be increased in the future as retirees pay taxes on their benefits. The present value of this tax revenue increase can be estimated. The successful TIFIA program is mostly utilized by PPPs that issue tax-exempt PABs. The program could create a more level playing field and encourage taxable infrastructure debt issuance by offsetting the value of future increased tax revenue against the self-pay FCRA credit subsidy cost of a TIFIA loan. Specifically with respect to interactions, the offset could be allowed for a PPP transaction that issued taxable debt to be bought by identified public pension plans with significant CFGs.

Endnotes

1 A recent estimate by American Society of Civil Engineers of the cost to improve American infrastructure up to an adequate standard is $3.6 trillion, or about 22% of 2013 US GDP. The ASCE Report Card (ASCE (2013-2)) is the most frequently cited measure of the American infrastructure challenge, and it is focused on the fundamental physical aspects of the problem. ASCE also assesses the economic aspect of the problem (ASCE 2013-1), as does the McKinsey Global Institute, for example, where infrastructure investment is one of the five US economic 'game changers' identified in a recent major study (MGI (2013)).

The pension crisis is not much smaller. According to the Center for Retirement Research, a realistic estimate of the aggregate unfunded liabilities of state and local public pension plans in 2012 was approximately $2.7 trillion, or 16% of GDP. As the US public pension challenge is increasingly recognized, there are a growing number of different studies of its magnitude. Most are consistent with this scale. The Center for Retirement Research study is often quoted and appears to be considered moderate and non-ideological (Munnell et al 2013). Rating agency reports are also frequently cited as credible since their purpose is neutrally commercial. Moody's estimate of the state adjusted unfunded liabilities (Moody's (2013-1)) is consistent with the CRR approach and results in an aggregate estimate of $1 trillion for states alone.

2 The State Budget Crisis Task Force, chaired by Paul Volcker and Richard Ravitch, issued a final report in January 2014 (State Budget Crisis (2014)), which forecast a difficult future for US state finances. Of the six major negative trends identified, two were infrastructure and pension fund challenges.

3 Boyd (2014): "If [public pension fund] contributions increase, governments will have to cut services such as education, police protection, or care for the needy, or cut investments in roads, clean water, and other infrastructure assets, or else raise taxes, often at times when those affected are least able to bear the consequences…This "crowd-out" phenomenon has been profound and widespread in recent years."

This is not only a problem in severe economic situations like Detroit or several California cities. For example, New York City (which has a very strong local economy and adequately funded pensions) requires significant investment in its infrastructure in order to stay competitive or even functional (Center for Urban Future (2014)) but the city's increasing pension fund obligations are beginning to crowd out these priorities (Reuters 2013)). Raising taxes to address the funding issues can be counterproductive, especially since states and local governments actively compete with each other for investment. For example, Illinois' fiscal difficulties and likelihood of increased taxation (primarily the result of unfunded pension obligation) are being actively exploited in neighboring Indiana's economic advertising.

In addition, the connection between infrastructure and public pension funding is being increasingly noted in the context of pragmatic solutions, prompted by difficulty, as opposed to a theoretical approach. See Glasgall (2014) for example, for observations in connection with Philadelphia's planned sale of energy infrastructure to fund the local pension. To the extent that this type of 'reactive' interaction between infrastructure and pensions is seen to work, a more 'proactive' approach will likely follow.

4 A recent example of this in the US is the Allentown water system lease (Governing (2013-2)). The political dynamic appears to be more explicit in other countries at this point. For example, some infrastructure development and privatization efforts in Australia put the connection to local pensions as the central rationale for the transaction (Infrastructure Investor (2013-1) and Infrastructure Australia (2012).

In addition, Australia appears to be in the forefront of successfully explaining the social benefits of infrastructure PPPs. From *Infrastructure Australia* (2012): "While governments may be concerned at the potential political issues in transferring assets to the private sector, the evidence is that the public will accept well managed and effectively communicated transfers. A number of examples demonstrate that public acceptance of asset transfers is more successful when members of the public are informed of the rationale for the transfer, that the proceeds from the transfer will be used to fund specific new infrastructure, and where the regulatory regime protects social objectives." This government report further explains that Australian "state governments, in particular, have had limited capacity on their balance sheets to fund a growing infrastructure task."

5 The State Budget Crisis Task Force makes the full extent of revenue challenges clear (State Budget Crisis (2014)). Specifically, public pension plans have gone from aggregate funded basis (using GASB reporting) from close to 90% funded in 2008 to 73% in 2012 (Munnell et al 2013) but due to GASB's permitted multi-year asset smoothing, this hides the deep impact of 2008. As an example, CalSTRS suffered a 25.4% decrease in plan asset fair market in 2008 financial crisis (CalSTRS (2013)). Despite strong gains in 2010-2012, net assets are still about 10% below their 2008 level. In part, this simply is due to the unfortunate mathematics of a major percentage loss in one year – even when subsequent percentage gains are as high, the base of earning assets is smaller.

6 While private-sector pensions are increasingly defined contribution plans, almost all public pensions in the US are defined benefits plans (Munnell (2012)). Whether or how this could change in the future is really the central focus of most the heated debate about public pensions, but for our purposes here, the past and current legacy of creating an obligation to pay defined benefits is what matters.

7 Munnell (2012): "Most important, despite the introduction of some defined contribution plans, most state and local pensions are defined benefit plans that share the same basic structure. They calculate the initial benefit at the normal retirement age as a product of three elements: the plan's benefit factor, the number of years of employee service, and the employee's average earnings….Benefit factors for state and local plans are clustered between 1.5 percent and 2.5 percent, with a typical rate of about 2 percent." This is the essence of a "basic deal" whose fairness it would be difficult to dispute.

8 A recent example of the non-controversial nature of core promises is seen in a fairly heated opinion page debate in Reuters, between a Reuters' economics blogger, Felix Salmon, and the co-chair of the Arnold Foundation, John Arnold. After strongly criticizing the Arnold Foundation's energetic advocacy for pension reform (including unfunded liability reduction) in a blog post, Salmon finishes by saying:

"[T]here's no reason to consider pension obligations to be any less, well, obligatory than bond obligations. Governments have to make good on them, so let's push hard to increase the degree to which pension plans in general are being funded." (Salmon (2014))

Arnold responded with a long and detailed rebuttal, but he noted agreement with Salmon: "Salmon and I agree that it would be much better to put workers from the outset in a system that places everyone on the path to retirement security regardless of tenure or date of hire. And we agree that we should hold governments accountable for fully funding the benefits that they promise to workers, whatever their form." (Arnold (2014))

Salmon and Arnold agree on little else with respect to public pensions (or the role of government itself for that matter) but their lack of difference on the core promises is indicative of the nature of this aspect of the pension challenge.

9 The calculation is straightforward, but access to the specific data is usually limited to plan sponsors and their auditors. Third parties can make rough estimates of plan liabilities from GASB public reports, but more precise estimates would require additional reporting from the plan sponsors. One of the main recommendations of a blue-ribbon panel report (Blue Ribbon Panel (2014)) commissioned by The Society of Actuaries is for specific disclosure of these cash flows:

"Users of plans' and funding entities' financial statements should be able to develop their own calculation of plan obligations. Therefore, the Panel recommends that two sets of benefit payment projections be provided for current employees, one on an accrued (earned-to-date) basis and one on a projected benefits basis."

10 Discounting liabilities by an estimate of what assets might earn has little theoretical basis in finance or accounting. The origin of GASB's approach is probably from actuarial practice, where the objective would be to estimate a plan's overall cash inflows and outflows over time. Also, from a practical perspective, when pension plans were limited to high-grade fixed-income as investments, either by tradition or mandate, the earnings approach does not differ that much from that using a low-risk discount rate. Now that public pensions increasingly invest in equity, and the downside risks of that were again made clear in 2008, the GASB approach is more obviously at odds with reality. Rauh (2011) pointed this out in 2010, and many others have come to the same conclusion. Andropov (2013) goes further and suggests that GASB is actually encouraging reckless behavior, despite the recent revisions included in GASB Statement No. 68 (GASB (2012)).

The impact is very significant. Munnell (2012) shows a range of aggregate state and local pension plan liabilities using discount rates from 8% (roughly the current GASB benchmark) to 4% (roughly risk-free US Treasury bonds), which results in less than $1 trillion of unfunded liabilities to over $3.5 trillion, respectively. The immediate impact of these values is really with respect to whether state and local governments are contributing anywhere near enough to amortize the funding gap. At GASB-like discount rates, some are doing enough or close to enough to stabilize the problem, but at the risk-free values, many are falling way behind – and, in effect, creating a major intergenerational equity issue (e.g. Eucalitto (2013)). The severity of the intergenerational issue is ultimately a question of how to discount future obligations.

For our purposes here, the rating agencies' approach is also relevant because we are concerned with real world constraints caused by the local plan. See Moody's (2013-1) and Munnell (2012). In this context, the prospect of a downgrade is clearly important, whether or not a plan is in "crisis" from an academic perspective. If a downgrade occurs, or is simply threatened, that is a problem for public sector authorities deciding on capital budgets.

Dreyfus (2013) uses an interesting defeasance approach to make the point that the usual GASB-permitted assumption of about 7.5% is too high: "In theory, if a plan were sold to a third party to assume its obligations, the unfunded liability would represent a deficit that would need to be satisfied. Any reasonable observer would find this deficit to be more than that estimated by the plan [under GASB] because plans customarily assume an optimistic annual return rate of 7.5 percent on assets."

11 Individual plans vary widely, so for many, the funding gap is much larger. Munnell et al (2013) shows an approximate distribution of GASB funding ratios for US plans. Over 20% of plans have a GASB funded ratio of less than 60%.

12 Munnell (2012): "About 30% of the state and local workforce – roughly 6 million workers – still are not covered by Social Security…The majority of public safety employees – police and fire – are not covered by Social Security."

13 'Moral obligation' as a descriptor used here should not be confused with municipal 'moral obligation bonds' which are a type debt provided by institutional lenders.

14 For example, in finding that Detroit public pensions did not have special protections under the Michigan state constitute, and that pension benefits were another contract subject to adjustment in Federal bankruptcy court, U.S. Bankruptcy Judge Steven Rhodes also added that the court "will not lightly or casually exercise the power to impair pensions." (The New York Times (2013-2)) The city manager's proposed plan of adjustment also reflected a significant priority to retiree benefits – while retirees would receive not less than between 65% and 90% of their core benefit payments, general obligation bondholders would only get about 20% of their claims (USA Today (2014)).

This result is despite relatively explicit legal parity after the ruling. *The New York Times* (2014): "Bankruptcy experts who are not involved in Detroit's case said it would, in fact, be possible for the city's pensioners to come out at the top of the pecking order, even though they were on par with the general obligation bondholders when the bankruptcy began."

15 Rauh (2010) shows that using 2008 data, the average number of years for state public pension plan assets to run out is about 20, with about 15 states running out in less than 15 years. Whether they actually will run out "on schedule" is, of course, another uncertainty that makes this form of public sector "debt" highly unusual.

16 For example, a modified COLA survived in Rhode Island's major pension reform proposals that are likely to be enacted this year. The modified version "would remain suspended until the $8 billion pension plan is 80% funded, with occasional COLAs issued every four years, instead of five years." (AI-CIO (2014)) In light of the severe underfunding of Rhode Island's state plan and the depth of reform, this modified COLA could be considered "core." Other changes would include updated actuarial estimates including demographics: CalPERS recently adjusted contribution rates based on new estimates of life expectancy (*Sacramento Bee* (2014)). Note that this change would only lengthen payment schedule duration.

17 *The New York Times* (2010): "[S]tates and other bodies of government are seeking higher returns for their pension funds, to make up for ground lost in the last couple of years and to pay all the benefits promised to present and future retirees. Higher returns come with more risk." See also *The Wall Street Journal* (2013-2)

18 European Investment Bank (2004): "The core objective for the public sector of a PPP programme is to harness private sector skills in support of improved public sector services. This is achieved by moving away from the direct procurement by the public sector of physical assets and towards the procurement of services from the private sector under public sector regulation/contract."

19 In theory, the potential for improving an infrastructure project's cost-effectiveness or efficiency through a PPP should be related only to the physical and commercial facts of the situation. However, descriptions of the increased interest in PPPs in the US are almost invariably connected to state and local fiscal constraints, not project improvement. For example, the following from the McKinsey Global Institute game changer paper is typical:

"Governments that own and operate infrastructure directly are increasingly considering options for engaging private investors to bridge the funding gap. Public-private partnerships, or PPPs, are commonly used around the world and are now increasingly being considered as a solution in the United States…. They are not without their pitfalls, however, and governments and private investors alike must approach these deals with appropriate caution… But in an era of fiscal constraints, governments may indeed look to bring in private expertise and capital to build infrastructure." (MGI (2013))

20 The scenario where governments face a higher cost of capital than their PPP projects is more common in emerging economies than in developed ones, both for credit and political reasons, but it is worth noting that managing the cost of debt issuance is a more fine-tuned process for developed economy governments, and at the margin there can be a credit component to a PPP transaction with respect to market timing, distribution diversification and establishing a secured borrowing track record.

The lowest current S&P state GO bond ratings are A- for California and Illinois. Other states range from A to AAA, with 88% of states being AA or better (S&P (2013-1)). Downgrades to below investment-grade status are not likely in the near future, but due to the relative shallowness and risk-aversion of the US municipal bond market, a negative watch announcement or one-notch downgrade can be very expensive. For local government, the range is much greater – as is the risk and cost of downgrades.

Perhaps one true credit-oriented case is Puerto Rico. The US territory faces significant credit issues due to its huge debt and pension obligations, and its bond rating was recently cut to below investment-grade by S&P (to BB+). The territory leased its San Juan airport in a PPP transaction in 2013 valued at about $2.6 billion, of which $615 million was an upfront leasehold fee (*The Wall Street Journal* (2013-1)).

21 The binding constraint often appears self-imposed: "In this study, the Congressional Budget Office (CBO) finds that private financing will increase the availability of funds for highway construction only in cases in which states or localities have chosen to restrict their spending by imposing legal constraints or budgetary limits on themselves." (CBO (2012)) But 'self-imposed' does not also mean 'easy or costless' to reverse or suspend. This is not just a political reality – maintaining fiscal discipline for the long run also means keeping to limits in the short-run.

22 In theory, a new greenfield project could be a source of net proceeds for the public sector if the value of services that it provides can be priced in a way that creates a present value sufficient to support capitalization in excess of the project cost. However, the opportunity to do this in a developed economy (where basic infrastructure is already in place) is probably very limited due financial cost and political factors. In practice, monetization is only possible – if at all – with brownfield projects.

The concept of releasing value from public assets is expanded in Geddes (2013). This paper proposes a concept of 'Investment Public-Private Partnership' (IP3) transactions that fully monetize existing brownfield road assets and use the proceeds to create dividend-paying sovereign wealth funds. The relevant point for our purposes here is the paper's position that infrastructure assets are owned by the public as a whole, not the just users, and that the public is entitled to realize that value for other purposes. It is logically a short step from using an IP3 to fund a sovereign wealth fund to using the same transaction to pay off an obligation – a CFG –that is also "owned" by the public as a whole.

23 *The New York Times* (2008): "For many politicians, privatization also remains a painful process. Mitch Daniels, the governor of Indiana, faced a severe backlash when he collected $3.8 billion for a 75- year lease of the Indiana Toll Road. A popular bumper sticker in Indiana reads, "Keep the toll road, lease Mitch.""

In particular, user fees are the "elephant in the room" for PPP development. *Infrastructure Investor* (2011): ""There's been a dramatic change in the political and social appreciation of infrastructure. The public takes infrastructure for granted, especially in the Western world. We [infrastructure investors] are now part of a mechanism that will force these assets to be paid for. This is social dynamite. And we'd better be very careful about how we explain this," Thomas Putter, former chief executive of Allianz Capital Partners, told a roomful of attendees at a recent conference organized by insurer Marsh."

Public resistance to user fees will also limit the range of objectives that private sector investors can realistically pursue in most cases, especially with respect to seeking upside profits. This is important in the context of PPP transactions: If the purpose of the deal is to finance infrastructure improvements on an off-balance sheet and off-credit basis, then the PPP transaction is in effect a type of secured debt financing, not a profit-maximizing equity opportunity. Public sector authorities might not always recognize this (and private investors are not incentivized to point it out), but public pressure to minimize user fees will likely force PPP capitalization to become increasingly focused on debt, with minimal private-sector equity or even continued public-sector ownership.

24 For example, see Governing (2013-3) for a description of the Chicago Infrastructure Trust. In Chicago's case, the PPP motivation is likely fast becoming more credit-oriented than accounting, but it is worth noting the interest generated by the infrastructure trust among other cities. User fees will be the main difficulty.

To highlight this, the 2009 Chicago parking meter deal is an example of a monetizing PPP where the economics were complicated, but the public perception was uniformly extremely negative: "In some cases, privatizing city services proved smart a way to infuse a cash-poor city with financial resources while trimming budgetary requirements. But in others, privatization was the governmental version of a payday loan gone bad; some cities will regret their decisions to trade long-term resources for one-time cash payments for years to come…Privatization skeptics hold up one deal as particularly bad: an agreement to hand control of Chicago's 36,000 parking meters to a private corporation, in exchange for about $1.15 billion in quick cash." (*The Washington Post* (2013))

25 For example, see *Bond Buyer* (2012)

26 For example, see *Governing* (2013-2)

27 A related concept, known there as 'social privatization', has recently been used in several Australian PPP transactions (*Infrastructure Investor* (2013-1)).

28 Pension Obligation Bonds (POBs) are a fairly standard – but questionable – way by which plan sponsors borrow on a recourse basis in order to make pension fund contributions. POBs are, in effect, taxable GOs. The theory is that even at taxable rates, the municipal issuer interest costs are low enough that the pension fund will (over time) out-earn the POB. Sometimes this works, but more often it does not (*Governing* (2013-1)). More relevant to our purposes here, since the POB is, like the CFG, a full recourse obligation of the plan sponsor, there would be no net debt reduction.

29 For examples, the Chicago Skyway PPP transaction has a lease term of 99 years, and the Indiana Toll Road is not far behind at 75 years. Social and energy infrastructure assets naturally have shorter terms, but usually as long as the physical asset's life will allow (e.g. California's Long Beach Courthouse PPP's term of 35 years).

30 Moody's is considering revising its state and local government rating methodology weightings to reflect doubts about political discipline: "Reducing the weight attached to economic factors, Moody's said, recognizes that some local governments are either unwilling or unable to convert the strength of their local economies into revenue gains. For example, a city might be unwilling to increases taxes because of anti-tax sentiment, it said." Other revisions would increase focus on pension obligations: "An increase in weight attached to debt and pensions would recognize the potential for large pension liabilities to constrict local government's financial flexibility," Moody's said in a release. "Pension liabilities and debt each represent enforceable claims on the resources of local governments." (*Bond Buyer* (2013))

31 The type of conservative investment most required by long-term institutional fiduciary investors to rebuild after the 2008 crisis is ironically the type most truncated by central bank policies seeking to mitigate the damage of that same crisis. Recent equity returns have been quite positive but these results are likely not sustainable over the long run.

32 See for examples Prequin (2014) and S&P (2013-2)

33 See for example *Infrastructure Investor* (2013-3)

34 The supply and demand imbalance for infrastructure investment is predictably putting pressure on deal return and quality. One Texas public pension CIO has recently decided to wait for market improvement: "Based on the market environment right now – there's just too many going after too few good deals," [the CIO] said, adding that given current conditions it was not worth the risk. (*Infrastructure Investor* (2014-1))

35 Project finance yields reflect imbalance of the supply of credit capital and the demand for projects. Current market spreads over Libor are about 200 bps, which swaps back to a long-rate of about 5.25%. Compared to either the spreads available in the liquid corporate bond market or to the implicit public pension GASB target of about 7.5%, such pricing is too close to the former and too far from the latter (Chadbourne (2014)).

36 For example, in TIFIA's list of about 35 completed and pending projects, 15 projects have or plan to issue PABs. In terms of dollar volume, PAB issuance in connection with deals is about $8.2 billion – compared to TIFIA's investment of $14.1 billion (TIFIA (2012)).

37 The syndicated project finance bank loan model might be especially well suited to both PPP issuers and public pension fund investors for range of reasons including risk management, illiquidity premia and expertise sharing. See Ryan (2013)

38 For example, a Texas public pension fund invested in a Dallas toll road PPP (North Tarrant (2014)) in a groundbreaking 2009 transaction, but most of the project's capitalization was placed in the capital markets, so it is not clear that the "local" aspect made much difference, other than perhaps to permit faster execution.

39 Infrastructure PPP project debt is likely to remain mostly private and unregistered, but the asset class may evolve in a similar way to the leveraged loan market, which provides significant secondary liquidity and volume for sub-investment grade bank loans. Some energy infrastructure project finance loans are already being placed in the leveraged loan market. See Chadbourne (2014) for related market commentary.

40 This is not to say that the likelihood of widespread and negative interaction between the infrastructure and pension fund challenges should not be explicitly recognized as an additional powerful impetus to policy action for each challenge on its own. The impact of any general interaction should be considered and assessed to the extent possible, but it should not be confused with identifying specific potential synergies.

41 As would be expected, much of the most vocal support is from groups who are positioned to benefit relatively directly from increased infrastructure spending, but surveys of voters also show (Rockefeller Foundation Infrastructure (2011)) broad grassroots support for increased federal infrastructure spending, especially when it includes private-sector investment.

42 All official descriptions of infrastructure policy proposals highlight the word "bipartisan" (for example, see Warner (2014)), but it is not just talk. There was actual and effective bipartisan support to increase TIFIA's funding and scope in the enacted bill (MAP-21 (2012)), even in an election year that prominently featured a failed deal, Solyndra, from another federal loan program. With the passage of the budget in 2014, and some apparent thawing in Congress on economic matters, bipartisan action for infrastructure may become even more feasible (Infrastructure Investor (2013-2)).

43 In light of the central role of the US federal deficit in polarization, bipartisan positions can be strongest for infrastructure policies that don't increase the deficit. In effect, like state and local governments, the US federal government faces its own fiscal constraints caused by pension obligations (Social Security) and healthcare (Medicaid and Medicare). As a result, practical proposals focus on policies that involve rules or mandates (Boyd (2014)) or off-balance sheet financing support (Ryan (2011)).

44 Senator Orrin Hatch recently proposed a bill that encouraged some privatization of public pension functions going forward (*The New York Times* (2013-1)). More relevant to our purposes here are ideas related to unfunded liabilities. Two ideas, from the former mayor of Los Angeles and a leading academic, respectively, proposed federal support to reduce the cost of state and local debt financing (either by guarantee or subsidy) for funding pension obligations (Riordan (2013) and Rauh (2013)). Predictably, these were seen as unacceptable bailouts among some commenters (e.g. Malanga (2013)). As with federal infrastructure policies, bipartisan support for federal pension policies is more likely for ideas that do not increase the federal deficit.

45 This is true enough in theory but probably even more important in practice. The negative spin and sound-bite potential that can attach to any story where a US policy seems to encourage a questionable outcome is huge in a polarized political environment. Even if it is an isolated case, the policy itself becomes tainted. Solyndra's failure, for example, was able to undercut almost all the other good that the DOE's loan program was able to accomplish. The outcome has to be easy to explain with respect to the clear national interest.

46 Full monetization is not inconsistent with improvement of the infrastructure asset – in theory. A new owner or concessionaire could be required to make operational or even capital improvements over time, using operating cash flow or future investments, but as a practical matter with respect to public perception, as well as to more immediate jobs, a significant amount of the proceeds should be used for capital improvements at the outset of the PPP.

47 Boyd (2014): "Retirement security is a priority concern of the national government, as evidenced by Social Security and Medicare programs. In many states, government employees, particularly teachers, do not participate in Social Security yet their benefits, which are not portable, are seldom higher than those of employees who also are covered by Social Security. In those states, and in all states where the ability to provide the core promise of retirement security is jeopardized by the serious unfunded status of their pension systems and inadequate means to correct rather than compound inadequacy, national objectives may fail…More broadly, there is also a national interest in much of what states and localities do, whether for federal programs such as Medicaid, or for investments and services that can have benefits that extend beyond state borders, such as infrastructure and education. If these state and local government activities are crowded out by sharp and sudden increases in retirement contributions, then the national interest suffers."

48 An example would be the modifications (beyond just increased funding levels) made to the TIFIA program in MAP-21 legislation (MAP-21 (2012)). There were approximately 10 significant changes, including in the definition of project portfolios, de-emphasized environmental aspects and increased scope for rural projects. Each clearly had a specific intent with respect to an economic outcome, and likely there was extensive debate and analysis within the congressional committees and among staffers, but none of the changes prompted any major media discussion and most were not even reported.

49 Although the seeds of interaction between the current infrastructure and pension fund challenges were planted across America over the course of the past decades, the financial crisis of 2008 was a fundamental turning point. The long-term effects of the crisis on the public sector finances (especially on those of state and local governments) and the legacy of prior actions and inactions have only become clear over the past few years. Prior to this point, the challenges themselves were often considered somewhat hypothetical. Going forward, this perspective is certain to change.

50 This can start with an existing well-established assessment methodology for PPPs, 'value for money'. Burger (2011): "Governments increasingly use public-private partnerships (PPPs) to pursue value for money. However, value for money is (or at least, should be) the driving force behind traditional infrastructure procurement. Therefore, any project, whether it is a PPP or a traditionally procured project, should be undertaken only if it creates value for money. It seems that the choice between using a PPP or traditional procurement should be simple: Governments should prefer the method that creates the most value for money. However, in practice, th value-for-money objective is very often blurred, and the choice between using a PPP and traditional infrastructure procurement may be skewed by factors other than value for money."

The assessment is important, as real-world results show. The UK has one of the world's most extensive track records with PPP transactions through its Private Finance Initiative (PFI). A very detailed parliamentary investigation about the overall results, however, showed that financially-motivated PPPs are actually quite prevalent, and that a positive Value for Money per se in many cases was dubious. The investigation's report said: "The incentive for government departments to use PFI to leverage up their budgets, and to some extent for the [UK] Treasury to use PFI to conceal debt, has resulted in neglecting the long term value for money implications." (UK Treasury Committee (2011)).

For an assessment approach to government loan programs by this paper's author, see also Ryan (2011). "Value for Capital" concepts could be included in a Value for Action methodology when the policy involves federal loan programs.

51 See ISRRPP (1998)

52 It is worth noting a rough distinction between federal infrastructure policies and programs that are intended to improve or regulate specific infrastructure assets (e.g. Interstate highways) and those that relate to a broad range of infrastructure and have a more general intent with respect to the US economy and jobs. The objectives of the former will be much narrower, and policy modifications will need to dovetail more precisely to asset-oriented purposes.

The ISRRPP is limited to asset-oriented objectives. An application by Pennsylvania to toll I-80 under the ISRRPP was rejected primarily because some projected revenues would be used outside the project itself (Toll Road News (2009)). Since the ISRRPP is a very asset-specific pilot program designed to improve the physical quality of the interstate roadways, proposals for brownfield monetization are unlikely to be consistent with the 'spirit' of the program.

53 See FAA Airport Privatization (2012)

54 Edwards (2010): "[T]he airlines lobbied hard to include a provision specifying that to keep sale or lease proceeds a city had to get the approval of 65 percent of the airlines serving an airport, which created a substantial hurdle to reform…As a result, progress toward privatization has been very slow over the last decade."

55 See Whitehouse (2011)

56 See BRIDGE Act (2013)

57 See WIFIA (2013)

58 The Allentown $211 million water system concession transaction (Governing (2013-2)) has the right size and other characteristics to have been done on a direct bilateral basis, albeit with the need for significant secondary sales. This water system's value is probably typical for many medium-sized US cities – as is the problem Allentown faced with its local public pension fund.

59 See TIFIA (2012)

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