

ANALYSIS OF PITTSBURGH'S PARKING ASSETS



**PREPARED FOR THE PITTSBURGH CITY COUNCIL AND
THE PARKING STUDY TASKFORCE**

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I. INTRODUCTION AND QUALIFICATIONS

Finance Scholars Group (“FSG”) is a national consulting firm composed of practicing finance and economics professionals and leading academics dedicated to assisting clients with strategic, accounting, financial, economic, and valuation matters. Numerous clients throughout the country, including Fortune 500 companies, law firms, accounting firms, universities, industry trade associations, and government agencies, have relied on FSG’s professionals and academic affiliates in a wide variety of matters covering numerous industries.

FSG's professionals are trained and dedicated to serving clients using the most current and sophisticated analytical tools available. They couple these tools with sound judgment and qualitative reasoning based on years of experience and a thorough knowledge of the relevant academic work. FSG has broad and deep expertise in the areas of finance, asset valuation, market analysis, securitization and economic forecasting. The company has worked on hundreds of matters, covering a broad range of industries and topics, including parking and asset monetization.

As an Academic Affiliate for FSG, I, Chester Spatt, led this project and directed the work of the FSG staff that assisted me. I am the Pamela R. and Kenneth B. Dunn Professor of Finance and the Director of the Center for Financial Markets at Carnegie Mellon’s Tepper School of Business. I also currently serve as a Visiting Scholar at the Federal Reserve Bank of New York, Research Associate of the National Bureau of Economic Research, Fellow of the TIAA-CREF Institute and Senior Economic Advisor to Kalorama Partners. I have been a faculty member at Carnegie Mellon (and a Pittsburgh resident) since 1979 and have been a tenured Full Professor at Carnegie Mellon since January 1, 1987.

My research and teaching interests include fixed-income, commodity and options valuation and hedging; the economics of financial market regulation; taxation and asset allocation; and market microstructure. This includes specific expertise and academic writing concerning both municipal bonds and pension investing. My articles have been published in the leading academic journals including the *Journal of Finance*, the *American Economic Review*, the *Journal of Political Economy*, the *Review of Economic Studies*, the *Journal of Economic Theory*, the *Review of Financial Studies*, the *Journal of Financial Economics*, the *Journal of Financial Markets*, the *Journal of Public Economics*, the *Rand Journal of Economics*, the *Journal of Business* and the *Journal of Real Estate Finance and Economics*, among others. Throughout much of my academic career, I have served on the editorial boards of leading academic journals, including stints as Co-Editor and then Executive Editor of the *Review of Financial Studies*.

In addition to my academic responsibilities, I served as the Chief Economist and Director of the Office of Economic Analysis at the U.S. Securities and Exchange Commission (SEC), and have been President of both the Western Finance Association and the Society for Financial Studies. I was one of the founders of both the Society for Financial Studies and the Foundation for Advancement of Research in Financial Economics. My consulting practice focuses on providing expertise on such issues as securities litigation and financial markets, financial regulation, credit rating agencies, mortgages and fixed-income securities, trading, taxation and asset allocation and financial valuation, among other areas.

I hold a Bachelor's degree in Economics from Princeton University (magna cum laude graduate), and a Master's and Ph.D. in Economics from the University of Pennsylvania. See **Exhibit I** for a copy of my curriculum vitae. See **Exhibit II** for a list of the information I, and/or those working at my direction, reviewed in connection with this matter.

II. SCOPE OF WORK

The City of Pittsburgh ("the City"), Pittsburgh City Council ("PCC"), and the Parking Study Taskforce ("PST") retained FSG to analyze six different alternatives for monetizing the City of Pittsburgh's parking assets ("the Assets") in the context of significant funding shortfalls in its pension plan. These facilities include 13 parking garages, 32 off-street metered parking lots and approximately 8,000 on-street metered parking spaces. The six alternatives are as follows:

1. Have all, or a portion of, the Assets shifted to, or absorbed by, the Comprehensive Municipal Pension Trust Fund ("CMPTF").
2. Sell the parking garages and surface lots owned by the Pittsburgh Parking Authority ("PPA").
3. Raise revenue through private management of the PPA garages and meter system.
4. Issue a bond backed by increased parking revenue.
5. Lease the PPA garages and meter system to a single private operator.
6. Allow for the state to take over the pension plan and raise additional revenue through increases in parking-related revenue to pay the increase in the minimum municipal obligation requirements.

After a preliminary review and analysis of available information, as well as discussions with Bill Urbanic, the PCC's Budget Director, and several Council members and/or their staff, the first three alternatives were excluded from further consideration based on prioritization of the issues and at least the following additional information:

- According to legal opinions rendered by Buchanan Ingersoll & Rooney, the Solicitor to the PPA, K&L Gates, special counsel to the PPA, and Frederick Frank, the Solicitor to CMPTF, I understand that legal obstacles and other hurdles prevent the transfer of the Assets to the Pension fund.¹ For example, the legal opinions raise concerns about whether the CMPTF is allowed to operate a private business and whether it would be sufficiently diversified if it owned the Assets. The opinions also question PPA's ability to serve as manager of the Assets, raise funds for capital expenditures, and exercise the authority to set rates for facilities owned by CMPTF. Furthermore, the opinions noted that outstanding bonds would need to be defeased prior to any transfer of assets to CMPTF. If the pension plan absorbed the parking assets there would not be a natural way to use the assets to finance the defeasance, as the pension plan could not undertake a bond financing itself despite receiving the economic value of the parking assets over time. Also, defeasance would require a considerable amount of upfront funds (discussed further in Section VIII.d below). Based on these factors, the PCC and I made the joint decision not to evaluate the asset transfer option.
- The PCC and I also determined that the proposed sale of the Assets would not be optimal, because given that the city wants the Assets to maintain their current function, the 50-year lease option intrinsically extracts more than 94%² of the value out of the Assets, while still allowing the city to maintain ownership of them (**Exhibit III**). Moreover, assuming the on-street meters would be excluded from a sale, the value received would most likely be insufficient to defease the bonds and meet the 50% pension funding requirement. The additional optionality and asset control provided through a long-term lease outweigh the benefit from an asset sale, given the constraints under which the City is operating. As such, the PCC and I determined that further evaluating the sale option would not add value to the City, unless it abandons the lease option and/or allows the Assets to be sold for their highest and best use, which from an economic perspective, may not be for parking.
- Finally, I understand the bond indentures prohibit long-term private management of the Assets, so the PCC and I removed that option from consideration, as well.

¹ Summary of Legal Opinions – Dowd/Lamb Parking Assets Plan.

² To value the sale option, I added a terminal value to the lease cash flows. The lease value divided by the sale value is equal to 94%.

Accordingly, this report addresses my analysis of the remaining three alternatives: leasing the Assets, keeping the Assets and issuing a bond to meet pension funding requirements, and keeping the Assets and allowing the State to take over the pension.

I understand that my study as described herein will assist the City Council with making an informed decision regarding the cost and benefits of various options, including public operation versus a lease of the Assets. My study is not an exhaustive assessment of all factors that influence this complex decision, and I intentionally do not opine on any actions that the City Council should take. Furthermore, multiple assumptions, which are based on interviews, research, and information from third party studies, underlie my financial analysis. To the extent the assumptions change, the results of my analysis will change. For example, in the event PPA retains the Assets, I have assumed PPA would institute the same parking rate increases as those listed in the Concession agreements. If PPA implements different rate increases, or uses a different time frame for the rate increases, it will significantly impact the results of my analysis. In this sense, the analysis is not one that focuses upon the determination of parking rates (in fact, I focus upon comparable pricing across the three alternative scenarios). Of course, the economic consequences to the City of substantial increases in parking pricing may be considerable, with respect to the pattern and level of economic activity, but such impacts upon business conditions in the City and the City's own tax revenue are outside the scope of this engagement, though may be a relevant consideration by the City Council. Data limitations also preclude precise quantitative analysis of certain model inputs, such as measures of the quantity responses to substantial increases in parking prices.³ This is one of the factors which led to using a range of inputs, which introduced greater variability in model results. Accordingly, my study is not intended to be a substitute for due diligence by potential bondholders, investors and/or other stakeholders.

III. BACKGROUND AND CONTEXT

A. THE PITTSBURGH PENSION

Pittsburgh, like many other state and local governments in the United States, faces a pension crisis. While the city has stabilized and transformed itself in recent years, building off the strength of its universities and health-care sectors, over the past fifty years Pittsburgh has experienced a loss of manufacturing jobs, a 50% population decline, stagnant tax base, and a growing fiscal dilemma. Also, as in much of the country, strong municipal employee unions have been more focused on pension benefits

³ Estimating the quantity response to substantial potential increases in parking prices would have benefited from significant variation over time in real pricing in the local market.

compared to salary increases, relative to many private sector employees.⁴ To begin to understand the underlying context of my analysis, it is instructive to consider historical trends in Pittsburgh's pension fund liabilities, assets and unfunded liability. These numbers over the last 15 years are as follows:⁵

Year	Liabilities	Assets	Unfunded Liability
1995	\$ 622.96	\$ 107.62	\$ 515.34
1997	\$ 667.75	\$ 156.97	\$ 510.78
1999	\$ 685.25	\$ 436.61	\$ 248.64
2001	\$ 712.98	\$ 423.06	\$ 289.92
2003	\$ 765.76	\$ 312.47	\$ 453.29
2005	\$ 843.38	\$ 373.61	\$ 469.77
2007	\$ 899.25	\$ 375.37	\$ 523.88
2009	\$ 989.53	\$ 339.18	\$ 650.35

(Dollars in millions)

The unfunded liability declined in the late 1990s, when Pittsburgh issued pension bonds to fund its pension through investments in equity. As these investments soured in the early 2000s, the unfunded liability increased and continues to increase, as the City currently contributes \$60 million per year to the pension plan while simultaneously paying approximately \$80 million annually to retirees.⁶ As of August 2010, the most recent actuarial report valued the pension assets at \$272 million and future obligations at \$990 million, resulting in an unfunded liability of \$718 million, or 72.5% unfunded.⁷ Moreover, the current \$718 million unfunded liability is calculated assuming a favorable 8% investment rate of return. Market valuation methods, such as those used by private-sector plans, discount pension benefit liabilities at lower interest rates to reflect more realistic asset returns. While Pittsburgh's use of an 8% rate to discount pension liabilities is consistent with the treatment allowed by the Governmental

⁴ Burnham, James, "Risky Business? Evaluating the Use of Pension Obligation Bonds," *Government Finance Review*, June 2003.

⁵ <http://www.briem.com/pension/PittsburghPension1.html>.

⁶ Conversations with Council members and Bill Urbanic; 8 31 09 Budget Memo Attachment.xls.

⁷ Smydo, Joe, "City Acts to Curb Further Pension Losses," *Pittsburgh Post-Gazette*, August 27, 2010.

Accounting Standards Board (GASB),⁸ this bias understates the measured underfunding relative to that consistent with a measure based upon financial theory and the methods used for corporate pension plans.

Act 44 of 2009 mandates that the Commonwealth of Pennsylvania take over Pittsburgh's pension plan if it has not achieved 50% funded status by December 31, 2010. Pittsburgh needs to contribute approximately \$200 million to the fund by year-end in order to retain ownership of its pension assets. As I understand the potential state takeover, it would not be accompanied by a state assumption of pension responsibilities; to the contrary, the state will be empowered to assess the City for various costs. As such, local political leaders are concerned about the possibility of a state takeover and seek to avoid the negative financial implications of that situation, which include the assessment of penalties and fees, as well as a loss of control over pension assets and benefits, among other things. For these reasons, the State mandate has generated considerable attention and placed the pension issues high on the agenda of local political leaders.

In summary, the key contextual points from Pittsburgh's pension situation to consider when reviewing this report are:

- The Pittsburgh pension plan has been significantly underfunded historically.
- Pittsburgh is providing pensions benefits on a current basis at levels in excess of those for which elected representatives are willing to contribute through the operating budget process.
- Rather than resolving the pension problems, the 1998 bond issue has left the city further in a "hole."
- Infusing funds into a pension plan is not a panacea.
- The current \$718 million in underfunded liabilities is based on higher levels of projected returns than have been earned over time, which make the estimate quite conservative. This is reinforced by the substantial decline in rates of return in the economy in the aftermath of the financial crisis.

⁸ At present, the accounting and financial reporting standards require governments to apply a discount rate that is based on their expected rate of return on the investments of the pension plan over the long term. Plans typically assume returns close to 8% to discount unfunded liabilities and figure out how much they would have to invest now to fully fund their plans. This approach allows pensions to credit themselves with healthy future gains — even if they don't set aside assets to invest. GASB's proposed reforms would require that, in the future, once a pension fund's assets are projected to be depleted, the fund would have to use a lower discount rate tied to a high-quality municipal bond index, likely 5% or 6%. GASB. *Preliminary Views of the Governmental Accounting Standards Board: Plain Language Supplement – Pension Accounting and Financial Reporting by Employers*. pg 5; Graham, Jed, "Pension Accounting Board to Government: Ignore our Rules," Investors.com, June 16, 2010.

- The targeted approximately \$200 million infusion would leave the City's pension plan substantially underfunded.

B. THE BROADER NATIONAL CONTEXT

It is also important for the citizens of Pittsburgh and Pittsburgh's governmental leaders to understand that the problem confronting the city, with respect to a substantially underfunded pension plan, is part of a broader problem confronting state and local governments throughout the United States, and many international countries as well; examples include California, New Jersey, Greece, Italy and Slovenia.⁹ This problem has been highlighted recently by a variety of discussions in the national media, the organization of a recent event by the U.S. Chamber of Commerce and an important academic paper, "Public Pension Promises: How Big are They and What are They Worth?" by Robert Novy-Marx (University of Chicago) and Joshua Rauh (Northwestern University). Using June 2009 data, Novy-Marx and Rauh estimate underfunding of state employee pension liabilities approximates \$1.31 trillion, when discounting liabilities using taxable municipal bond discounting, and \$2.54 trillion using Treasury discounting. This compares to approximately \$1.89 trillion in assets in the plans, meaning the underfunding of state plans is more than 57% when the pension benefit is considered sacred and not subject to default risk and the underfunding is approximately 41%, in the aggregate, when the municipal pension plan has the same risk of default as municipal bonds. The corresponding figures for Pennsylvania are liabilities of \$164.5 billion using Treasury rates, \$124.2 billion using taxable municipal bond discounting, and assets of \$67.4 billion. The underfunding by Pennsylvania is about 59%, when the pension benefit is considered sacred using Treasury discounting, and more than 45% when the liabilities are discounted at the same rate as taxable municipal bonds.

These statistics emphasize several different ideas that are important for understanding the pension context.

- There is a massive underfunding problem in governmental pensions in the country as a whole.
- Pennsylvania's role in the underfunding crisis is far from "clean." Not only does Pennsylvania suffer from the broader issues, but its situation is slightly worse than the norm. Separate from

⁹ *California 'Fiscal Emergency' Declared*, BBC News, July 29, 2010, (<http://www.bbc.co.uk/news/business-10802119>); *Sanity in the Offing? A Deal With Four Unions is a Good Start*, The Economist, June 24, 2010, (<http://www.economist.com/node/16438779>); and *TIMELINE-Greece's Debt Crisis*, Reuters News, September 6, 2010, (<http://www.reuters.com/article/idUSLDE6851YD20100906>).

its legal authority to supervise Pittsburgh, Pennsylvania does not deserve to take the moral high-ground on the issue of underfunding, as its pension plan is underfunded by almost \$100 billion.

- The statistics highlight the issue of the appropriate discount rate to apply to pension liabilities. Financial theory does not point to a rate of anywhere near 8%. The appropriate discount rate is not the expected return on equity or the equity return on a composite investment portfolio. Instead, the discount rate should be determined, not by the risk of the assets (apparently conventional practice), but the risk of the liabilities. This is why Novy-Marx and Rauh point to the Treasury curve (assuming that the pension payments are sacred and not vulnerable to default) or the taxable municipal curve (then assuming that the risk of default is the same as for bondholders). This is basic financial theory.

C. RESPONSES TO SIMILAR SITUATIONS

There are a number of situations analogous to Pittsburgh's situation. Reviewing those situations and the corrective actions taken provides a contextual framework for my analysis. Accordingly, I summarized some of those situations below.

THE SOCIAL SECURITY ANALOGY

The Social Security plan is quite different than most pension plans—both those of corporations and municipalities. Social Security is not funded on an actuarial basis (quite explicitly), but instead largely funded out of the current contributions. The core of the 2005 Social Security proposal of the Bush Administration was the idea of reserving a portion of the contributions for equity investing. Some of this orientation was philosophical, but an aspect reflected a misunderstanding of the historical evidence on equity returns. While equity returns have exceeded fixed-income returns by a substantial amount, this is not true for every historical period and indeed, there is huge variability in long-horizon equity returns. Although many observers think that risk declines with the horizon, that is a common fallacy; while it's true that annualized average returns became less variable over longer horizons, the underlying dollar risks grow with the horizon. As an example, investors who lost a considerable portion to their wealth during the recent financial crisis are unlikely to make that up going forward—the broad revaluations reflect true changes in our economy and are unlikely to be simply reversed. Given the financial crisis, if we had started investing Social Security assets in equity during 2005, the Social Security trust fund would be obviously in much worse shape at present. The U.S. Congress rejected the proposal

to incorporate equity investing in Social Security—recognizing that equity investing in pension plans is not a “free lunch.”

The Social Security proposal parallels other proposals to infuse proceeds of assets sales or borrowings into a pension plan which then invests the funds in equity. Over many horizons these investments would lose significant amounts of money. As Pittsburgh experienced in the late 1990s, borrowing funds from the future by issuing a debt instrument or selling a long-term lease would lead to a pronounced increase in risk imposed on the taxpayers funding the plan. Likewise, Congress decided to avoid such risky investments with Social Security contributions.

NEW JERSEY

Earlier this year, Governor Chris Christie announced a decision to forgo New Jersey’s required \$3.1 billion payment to the state’s pension fund as part of balancing the 2011 state budget.¹⁰ This continues New Jersey’s history of under-funding its pension; during the 2004 through 2010 time period, only \$2.43 billion in payments were made to the pension fund out of a required \$10.15 billion.¹¹ In aggregate, liabilities totaled \$125 billion at the end of 2008,¹² compared to the fund’s market value of \$63.2 billion at the end of 2009,¹³ approximately a \$61.8 billion difference. Moreover, applying the rate of return that reflects the risk-free character of pension obligations, such as the Treasury bond rate of 3.5%, increases the unfunded liability to \$173 billion.¹⁴

Governor Christie’s decision to defer the pension payments is not motivated simply by a decision to balance the current state budget, but by a conscious view that New Jersey should obtain better control of its pension obligations and that minimizing the funding is potentially a way to do so. This is illustrated by the following excerpt of an interview with Governor Christie on the “Wall Street Journal Editorial Report” conducted by Editorial Page Editor Paul Gigot last month:

¹⁰ Fleisher, Lisa, “N.J. Budget 2011: State will skip \$3.1 billion pension fund payment,” NJ.com, June 29, 2010; http://www.nj.com/politics/index.ssf/2010/06/nj_budget_2011_state_will_skip.html.

¹¹ Fleisher, Lisa, “N.J. Budget 2011: State will skip \$3.1 billion pension fund payment,” NJ.com, June 29, 2010; http://www.nj.com/politics/index.ssf/2010/06/nj_budget_2011_state_will_skip.html.

¹² *The Trillion Dollar Gap - State Fact Sheets*, The Pew Center on the States, Feb. 2010 (http://www.pewcenteronthestates.org/uploadedFiles/wwwpewcenteronthestatesorg/Initiatives/R_and_D/Trillion_Dollar_Gap_factsheets_NewJersey.pdf)

¹³ As of 2009. Fleisher, Lisa, “N.J. Budget 2011: State will skip \$3.1 billion pension fund payment,” NJ.com, June 29, 2010; http://www.nj.com/politics/index.ssf/2010/06/nj_budget_2011_state_will_skip.html.

¹⁴ *The Crisis in Public Sector Pension Plans, A Blueprint for Reform in New Jersey*, Eileen Norcross, Andrew Biggs, Mercatus Center, George Mason University, Working Paper, 6/23/2010, (<http://mercatus.org/sites/default/files/publication/WP1031-%20NJ%20Pensions.pdf>).

GIGOT: *What's your response to those people who say, you know what, part of that \$10 billion deficit you closed, you kicked the can on a \$3 billion pension contribution down the road. That's not a real long-term savings.*

CHRISTIE: *Well, what I would say to them is I've already worked towards pension reform, which we passed a good amount of pension reform in March, but until we get all of it, I'm not going to throw good money into bad into this system. And I certainly am not going to raise taxes in order to do it. We have to bend the benefit curve and get pensions to be more realistic and then I'm happy for make the state to make their contribution.*

GIGOT: *So you'll make that contributions, but only if they reform the pension system, which, I assume, means benefits.*

CHRISTIE: *It means benefits, absolutely. We have to change the way the system operates and we have to go to a tiered system. There's a whole bunch of different ways to reform this to make our deficit in the pension system, which right now is at about \$50 billion. We need to do something. We're never going to have enough money to pay that \$50 billion debt, so we have to bend the benefit curve and that's what we'll be working on this fall.*

Pennsylvania's plan for Pittsburgh is rather different—while New Jersey is suspending its payment due to concerns about the viability of its pension system, absent improved control of the benefit generating process, Pittsburgh is being pressed by its state for an extraordinary payment. By Governor Christie's logic, such a payment would reduce Pittsburgh's ability to improve control of the cost of its pension benefits.

New Jersey's pension problems also include a recent settlement with the SEC regarding charges of fraudulent activity. In August 2010, New Jersey settled claims that it committed fraud by selling \$26 billion of bonds from 2001 to 2007 without disclosing that it failed to put enough cash into its two biggest pension plans.¹⁵ New Jersey settled the SEC charges without admitting or denying guilt, and did not pay a fine, but agreed to refrain from future violations of securities laws.¹⁶ This is the first time the SEC has ever sued a state for securities fraud, and the action underscores the growing awareness and significance of the pension funding issues for potential municipal bond investors.

¹⁵ SEC's New Jersey Fraud Case Seen as Harbinger in Muni Crackdown, Bloomberg.com, 8/19/2010, (<http://www.bloomberg.com/news/2010-08-19/sec-muni-bond-drag-net-may-ensnare-a-dozen-issuers-after-new-jersey-settles.html>).

¹⁶ Gordon, March, "NJ Settles SEC Fraud Charges Over Muni Bond Sales," The Huffington Post, August 18, 2010 (http://www.huffingtonpost.com/2010/08/18/nj-settles-sec-fraud-char_n_686727.html).

CHICAGO

In December 2008, the City of Chicago entered into a \$1.157 billion,¹⁷ 75-year parking concession and lease agreement with Chicago Parking Meters, LLC, a consortium led by Morgan Stanley. The agreement was for a concession and lease of Chicago's Metered Parking System, which had approximately 36,000 parking meters, to be operated by LAZ.¹⁸ Chicago used \$400 million of the proceeds to establish a long-term reserve fund, with approximately \$20 million annually going to replace the revenue currently generated by the meters.¹⁹ Another \$325 million will be used to balance budgets through 2010, \$100 million was targeted for the needy, and the final \$324 million will establish a budget stabilization fund.

After the transaction closed, public backlash was overwhelmingly negative as meter prices skyrocketed, meters malfunctioned, and the implementation of new technology was poorly executed.²⁰ Furthermore, in June 2009, Chicago's Inspector General released a report concluding that the City had received a "dubious financial deal" compared with the long-term value to the City of 75 years of parking meter revenue.²¹ The Inspector General critiqued the City's failure to a) calculate the value of the parking system to the City, b) consider lease alternatives that could still solve the budget problem and c) conduct meaningful deliberative process in City Council.²² William Blair & Company, the lead independent financial advisor to the City of Chicago in connection with the concession and lease agreement, responded by noting incorrect calculations in the Inspector General's report and reiterating that the winning bid was at the high end of the "best case" estimated value of the parking system.²³

Recently, documents for a \$500 million private note sale by Chicago Parking Meters, LLC revealed the company expects to realize \$9.58 billion in profits before interest, taxes and depreciation over the

¹⁷ City of Chicago, Office of the Inspector General, *Report of the Inspector General's Findings and Recommendations: An Analysis of the Lease of the City's Parking Meters*, June 2, 2009.

¹⁸ Morgan Stanley press release, *Chicago Parking Meters, LLC Selected as Winning Bidder for the Chicago Metered Parking System*, December 3, 2008.

¹⁹ Shields, Yvette, "Chicago Scores \$1.16 with Meter Lease Deal," *The Bond Buyer*, December 3, 2008 (http://www.bondbuyer.com/issues/117_230/-297115-1.html).

²⁰ *FAIL, Part 1: Chicago's Parking Meter Lease Deal*, Chicago Reader, April 9, 2009,

(<http://www.chicagoreader.com/chicago/features-cover-april-9-2009/Content?oid=1098561>);

Mihalopoulos, Dan, "Company Piles up Profits from City's Parking Meter Deal", *The New York Times*, November 19, 2009.

²¹ City of Chicago, Office of the Inspector General, *Report of the Inspector General's Findings and Recommendations: An Analysis of the Lease of the City's Parking Meters*, June 2, 2009, p. 3.

²² City of Chicago, Office of the Inspector General, *Report of the Inspector General's Findings and Recommendations: An Analysis of the Lease of the City's Parking Meters*, June 2, 2009, pp. 4-6.

²³ Report of William Blair & Company dated June 30, 2009, pp. 6 and 10.

75-year lease.²⁴ While the public and the press seem to have reached consensus that this was a “fire-sale,” primarily based on its Inspector General’s report, this conclusion is not clear-cut. Some of the public unease may depend upon the lack of understanding of the consequences of future value versus present value on long-lived projects. For example, \$9.58 billion in Earnings Before Interest, Taxes, Depreciation and Amortization (EBITDA) over 75 years discounted to present at 10% is less than \$1 billion, even without considering required capital expenditures, taxes and financing costs. Of course, at lower discount rates the assets would be more valuable, so the assumed discount rate is crucial to one’s conclusions. I address this issue later in the report.

LESSONS LEARNED FROM ANALOGOUS SITUATIONS

There are a number of key takeaways from the analogous situations described above. These include at least the following:

- Investing in equity is riskier than investing in investment-grade debt. Accordingly, the only way it makes sense for a pension plan to invest in equity and/or not be fully funded is in settings in which the option to pull back from the plan continues to have substantial value (Spatt (2005));²⁵ i.e., one must have the ability to walk away from a risky investment, if the investment fails. If the City’s leadership does not view backing off from pension benefits as a serious option, then the case for investing in equity is quite weak.
- Pennsylvania’s insistence that Pittsburgh make an extraordinary payment into its pension plan reduces the City’s ability to implement cost control improvements with respect to its pension benefits.
- Pension funding disclosures are a first-order issue for bond investors.
- Differing interests have the ability to distort and manipulate financial metrics to motivate public response. To avoid public backlash, it is important for the city to fully vet its options and detail the economic rationale motivating its decisions.
- It is difficult to be certain that a lease does not result in a fire-sale.

²⁴ Preston, Darrell, “Morgan Stanley’s \$11 Billion Makes Chicago Taxpayers Cry,” Bloomberg.com, August 8, 2010 (<http://www.bloomberg.com/news/2010-08-09/morgan-stanley-group-s-11-billion-from-chicago-meters-makes-taxpayers-cry.html>).

²⁵ Chester Spatt, “Why Private Pensions Matter to the Public Capital Markets,” SEC Staff Speech, Georgetown University, November 16, 2005. <http://www.sec.gov/news/speech/spch111605cs.htm>.

IV. INTRODUCTION TO VALUATION

There are three generally accepted methods to valuing an asset or business. These are commonly referred to as the *asset approach*, the *market approach*, and the *income approach*. I briefly discuss these three approaches below.

A. THE ASSET APPROACH

The asset approach views the business as a set of assets and liabilities used to construct business value. In the context of valuing the parking assets, this approach entails assessing the cost of duplicating the PPA facilities in their present condition. While this approach could be useful for certain purposes, such as insurance value, in my opinion, it is not a valid measure of value for the purposes of this report. Furthermore, the real value of the assets may lie in an alternative use, such as office space. In that case, an accurate valuation using the asset approach would involve an assessment of the likely economic benefit to the City of Pittsburgh of building and leasing space in office buildings or leasing the property to private developers to do the same. Because nothing of this sort is under consideration, a valuation of PPA's parking assets using the asset approach is unwarranted.

B. THE MARKET APPROACH

Valuation of the Assets using the market approach entails collecting and analyzing data and information on other public-private partnership ("P3") agreements that relate to city-controlled parking assets. This information from "comparable" agreements would then be adjusted to account for specific characteristics of the PPA agreement under consideration to determine a valuation.

Public-private partnerships are agreements between a government entity and a private sector entity whereby the skills and assets of each of these sectors are shared in delivering a service or providing a facility to the public, with some of the operational and financial risk associated with the facility being transferred from the public to the private sector.²⁶ According to my research, over the past few years, the following three P3 agreements involving parking facilities have been consummated by two different municipalities, Chicago, Illinois and New Haven, Connecticut:

- In 2006, the City of Chicago and the Chicago Park District entered into a \$563 million, 99-year parking concession and lease agreement with Morgan Stanley Infrastructure Partners.²⁷ The agreement was for a concession and lease of the Chicago Downtown Public Parking System,

²⁶ The National Council for Public-Private Partnerships, *How PPPs work* (<http://www.ncppp.org/howpart/index.shtml#define>)

²⁷ William Blair and Co. Debt Capital Markets Department announcement, *Chicago Metered Parking System Long-Term Concession* (<http://www.williamblair.com/documents/MeterTransaction.pdf>).

consisting of four downtown underground parking garages containing a total of 9,178 parking spaces. The operations of the garages were to be run by LAZ Parking (LAZ).²⁸

- In December 2008, the City of Chicago entered into a \$1.157 billion,²⁹ 75-year parking concession and lease agreement with Chicago Parking Meters, LLC, a consortium led by Morgan Stanley. The agreement was for a concession and lease of Chicago's Metered Parking System which had approximately 36,000 parking meters, to be operated by LAZ.³⁰
- In 2010, the City of New Haven, CT entered into a 25-year, lease/leaseback deal with Gates Group Capital Partners, LLC ("Gates") for an up-front payment of \$50 million from Gates.³¹ Unlike the Chicago deals, the New Haven maintains control of the parking meters, garages and their management under a 25-year lease/leaseback arrangement. Gates' financial interest is capped at the lease payments, with all moneys from the meter system accruing to the City once the lease payments are satisfied.³²

In addition to these deals, the City of Los Angeles is currently studying the prospect of privatizing its parking spaces, along with other city-owned assets.³³ According to a recent *Wall Street Journal* article, "[a]round the country, at least a dozen public parking systems are up for bid, including in San Francisco and Las Vegas."³⁴ Most recently, the City of Indianapolis announced on August 20, 2010, that it is vying to get a 50-year concession agreement with Affiliated Computer Services (ACS) and its partner, Denison Parking Inc. (Denison), a local parking operator, approved by its city council.³⁵ The agreement covered 3,600 of the city's public metered parking spaces to be operated by ACS and Denison. If approved, the city will receive \$35 million upfront, plus a share of revenues earned, starting at 20% and increasing to 50%, which the city estimates will generate an additional \$400 million over the course of the deal.³⁶ Parking hours will be extended and hourly parking rates are expected to double. ACS plans to invest up

²⁸ P4 Partners, LLC and Aurora Capital Group, *City of Indianapolis, Indianapolis Parking System, Response to RFQ*, March 15, 2010.

²⁹ City of Chicago, Office of the Inspector General, *Report of the Inspector General's Findings and Recommendations: An Analysis of the Lease of the City's Parking Meters*, June 2, 2009.

³⁰ Morgan Stanley press release, *Chicago Parking Meters, LLC Selected as Winning Bidder for the Chicago Metered Parking System*, December 3, 2008.

³¹ City of New Haven, Office of the Mayor press release, *City Announces Initial Details on the Structure of Parking Meter Monetization*, March 19, 2010.

³² Bass, Paul, "Losing Bidder: Privatize. Then Monetize," *New Haven Independent*, April 21, 2010.

³³ Dugan, Ianthe Jeanne, "Facing Budget Gaps, Cities Sell Parking, Airports, Zoo," *The Wall Street Journal*, August 23, 2010.

³⁴ *Ibid.*

³⁵ Advance Indiana Blog, *50-Year Parking Lease Agreement a Win-Win for Denison Parking* (<http://advanceindiana.blogspot.com/2010/08/50-year-parking-lease-agreement-win-win.html>)

³⁶ Indianapolis Business Journal, *City Chooses Firm to Oversee Parking Meter Operations* (<http://www.ibj.com/article?articleId=21811>)

to \$10 million to replace the city's coin meters with newer models that will accept credit cards.³⁷ ACS and Denison will oversee enforcement while the city will continue maintenance and coin collection.³⁸

In addition to parking agreements, local and state governments have also entered into P3 agreements involving other facilities related to automobile transportation, including the following:

- In 2005, the City of Chicago entered into a \$1.8 billion, 99-year concession and lease agreement with the Skyway Concession Company, a private consortium led by Macquarie and Cintra Concesiones. The agreement was for a concession and lease of the Chicago Skyway, "a 7.8-mile toll road that is the only toll highway in the state not operated by Illinois Toll Highway Authority."³⁹
- In 2007, the Indiana Finance Authority entered into a \$3.8 billion, 75-year toll road concession and lease agreement with the Indiana Toll Road Concession Company, a private consortium led by Macquarie and Cintra Concesiones.⁴⁰ The agreement was for a concession and lease of the 157 mile long, Indiana Toll Road which "links the largest cities on the Great Lakes with the Eastern Seaboard."⁴¹

Due to the diversity of the municipalities involved, the differences in assets leased, and the differences in terms of the agreements executed between the municipalities and their respective private partners, it is difficult to extract comparable metrics from these transactions to guide a valuation of the Assets using the market approach. Therefore I focused on the income approach as the optimal means for a valuation of the Assets, which I describe below.

C. THE INCOME APPROACH

The fundamental precept of the income approach is that the value of an asset depends on the future economic benefits that will be derived by the asset. The economic benefit is normally some measure of future income, such as free cash flow or some other profit measure. The projected future income is discounted to present value using an appropriate discount rate that reflects the expected risk

³⁷ Indianapolis Business Journal, *City Chooses Firm to Oversee Parking Meter Operations* (<http://www.ibj.com/article?articleId=21811>)

³⁸ Indianapolis Business Journal, *City Chooses Firm to Oversee Parking Meter Operations* (<http://www.ibj.com/article?articleId=21811>) ; and Transport and Project Finance Blog, *Infrastructure Market Update: 22 August 2010* (<http://transportandprojectfinance.blogspot.com/2010/08/infrastructure-market-update-22.html>)

³⁹ <http://www.chicagoskyway.org/about/history.asp>

⁴⁰ P4 Partners, LLC and Aurora Capital Group, *Op. Cit.*

⁴¹ Cintra press release, *Cintra begins operating Indiana Toll Road (USA) under a 75-year concession*, June 29, 2006.

of the projected stream of future income. In the analysis that follows, I use the income approach to value the Assets.

D. FSG VALUATION

I utilized a multi-variable discounted cash flow analysis to assess the value of the Assets to the City for the period 2011 through 2060. The model comprises several key drivers:

- Elasticity of demand to account for changes in demand resulting from changes in price, which in turn, influences the expected revenues generated by the parking assets;
- A discount rate to reflect the cost of capital and riskiness of the expected cash flows;
- Estimated free cash flow for the 50 year period from 2011 through 2060, calculated as revenues less operating expenses less taxes and capital expenditures.

The valuation results indicate the parking garages and meter system are worth approximately \$199.8 million and \$201.3 million, respectively, in net present value for the next fifty years (**Exhibits IV-A.1 and IV-B.1**). These results incorporate fixed values for inputs such as elasticity of demand, annual growth rate, and the discount rate. Simulation analysis tested the sensitivity of the valuation in the presence of parameter value uncertainty to a likely range of parameter values. This generated valuation ranges of \$152.4 million to \$236.5 million for the parking garages, and \$133.8 to \$234.3 million for the parking meter system.⁴² Sections V through VII below discuss the key drivers and valuation results in more detail.

V. ELASTICITY

A. PRICE ELASTICITY OF DEMAND FOR PARKING SERVICES

The demand for parking services in PPA facilities depends on several factors, including the prices charged for parking, the prices and convenience of parking in alternative locations, and household income.⁴³ The hourly price charged for parking influences drivers' decisions on their chosen parking location as well as the length of time they wish to park. To assess the impact on revenues from increases in parking prices, it is necessary to understand the relationship between consumer demand and price. Economists measure the responsiveness of consumer demand to a change in price using the

⁴² Based on a 90% confidence interval generated from 10,000 simulations.

⁴³ In fact, individuals and households will attempt to substitute across many margins in their choice of mode of transport, house location, job location, as well as shopping locations or methods. For example, people may choose to shop on the internet instead of an establishment if the cost of transportation, including parking, is considered prohibitive. While topics such as these are an interesting issue for further analysis, there is limited data available by which to assess their importance to actual outcomes and are thus beyond the scope of the current analysis.

price elasticity of demand, defined as the percentage change in the quantity demanded in response to a one percent increase in price (holding fixed other factors that may influence the quantity demanded). The price elasticity of demand for parking services is the percentage change in the parking hours demanded in response to a one percent increase in the price of parking.⁴⁴

The price elasticity of demand for parking services is a sensitive variable in assessing the value of the parking assets. I reviewed the available literature on parking demand to arrive at an estimate of this elasticity of -0.3.⁴⁵ To illustrate, assume that when the hourly price of parking is \$1.00, 10 parking spaces are typically occupied for 10 hours each day, so that there is a demand for 100 total parking hours per day in those spaces. With an elasticity of -0.3, an increase in the price of parking from \$1.00 to \$1.25 will result in a decrease in parking demand of 7.5 hours per day.⁴⁶

Calculating elasticity specific to Pittsburgh would provide the best estimate of the response of Pittsburgh parkers to an increase in parking fees. However, I received insufficient data to quantitatively assess elasticity of demand specific to Pittsburgh. The last time there was a significant rate increase was in 2004 and data necessary to reliably compute the associated impact on demand were not available. Thus, the valuation model described below employs price elasticity of -0.3 based on academic studies. Simulation analysis tested the sensitivity of the valuation to elasticities ranging from -0.1 to -0.5.

B. CROSS-PRICE ELASTICITIES

Economists measure the responsiveness of the quantity demanded of one good to a change in the price of another good or service using the *cross-price elasticity of demand*. Formally, the cross price elasticity between two goods *X* and *Y* is defined as the percentage change in the quantity demanded of

⁴⁴ The elasticity can then be used to measure the demand response for larger price changes than one percent.

⁴⁵ There are multiple academic articles and other studies that support a -0.3 price elasticity. See, *inter alia*, Kelly, J. Andrew and Clinch, J. Peter, "Temporal Variance of Revealed Preference On-Street Parking Price Elasticity," *Transport Policy*; Vol. 16 (2009); pp. 193 – 199 at 198; Henscher, David A. and King, Jenny, "Parking Demand and Responsiveness to Supply, Pricing and Location in the Sydney Central Business District," *Transportation Research Part A*; Vol. 35 (2001); Shoup, Donald C., "Cashing Out Employer-Paid Parking: A Precedent for Congestion Pricing?," *The University of California Transportation Center Working Paper No. 205* (July 1993); Vaca, Erin and Kuzmyak, J. Richard, "Parking Pricing and Fees ," Chapter 13 in *Traveler Response to Transportation System Changes*, Transit Cooperative Research Program Report 95 (2005); TRACE, *Final Report For Publication*, Contract No. RO-97-SC.2035 (1999). One study conducted at Carnegie Mellon University analyzed the response to increases in garage lease rates at PPA garages. In this study, the weighted average elasticity was -0.35 and the arithmetic average elasticity was -0.3.

⁴⁶ Denoting Δq for the change in the hours of parking demanded in response to a price change and Δp for the price change (\$0.25), then the price elasticity of demand for parking services is $(\Delta q/q) / (\Delta p/p) = (\Delta q/100) / (\$0.25/\$1.00) = -0.3$, implying that $\Delta q = -7.5$ hours. Note also that a price elasticity of demand in the range from 0 to -1 implies that demand for parking services is not highly responsive to changes in prices, which economists refer to as "inelastic" demand. With inelastic demand, price increases generate increased revenue, since drivers do not respond to the increase by dramatically reducing their demand for parking services.

good *X* in response to a one percent rise in the price of good *Y*. Substitutes are alternatives to the good or service whose price has increased, and complements are goods or services that are consumed in conjunction with the good whose price has increased. If the cross-price elasticity of demand is positive, then *X* and *Y* are *substitutes*, whereas if it is negative, then they are *complements*.

The primary substitutes for the PPA parking services are alternative parking facilities and other means of transport, such as public transport,⁴⁷ car pooling,⁴⁸ and park and ride. If alternative parking facilities are available, conveniently located, and priced similarly, then the demand for PPA parking services will be more responsive (elastic) to increases in fees. An increase in the price of parking charged by the city would provide incentives for drivers to seek out alternative parking locations and means of transportation, or choose to park less preferred locations where prices are lower.⁴⁹

The literature I reviewed indicates that cross-price elasticities for different modes of transport are positive, meaning they are substitutes.⁵⁰ For example, Henscher and King (2001) report that a 10% increase in prices at preferred parking locations within the central business district of Sydney, Australia results in a 3.6% increase in park and ride trips, a 2.9% increase in trips on public transport, and a 4.7% decrease in trips to the central business district.⁵¹

In addition to the effects of parking price increases on the mode-of-transport and parking decisions of drivers, increases in parking prices may also influence the types of economic activities supported by city-owned parking facilities. After all, transport demand, including the demand for parking, “ ... [I]s a derived demand which stems from an alternate primary objective.”⁵² For example, to the extent that city parking facilities are utilized by drivers that patronize establishments offering services that are considered time-consuming – restaurants, coffee shops, shopping centers, and salons - such establishments and activities are complements to parking services, since the consumption of parking increases as consumers demand more of the goods and services that are located nearby. If parking prices increase, drivers may substitute away from parking services by changing behavior, such as choosing shorter parking durations,⁵³ or by foregoing or delaying trips to such locations.⁵⁴ This may negatively impact local businesses and, in turn, city finances, due to reduced revenues from sales taxes if

⁴⁷ Henscher and King (2001) *Op. cit.* TRACE (1999) *Op. cit.*

⁴⁸ TRACE (1999), *Op. cit.*

⁴⁹ Henscher and King (2001), *op. cit.*

⁵⁰ Henscher and King (2001), *op. cit.*; TRACE (1999), *Op. cit.*

⁵¹ Henscher and King (2001), *op. cit.*, p. 192.

⁵² Kelly and Clinch (2009). *Op. cit.*

⁵³ Kelly and Clinch (2009). *Op. cit.*

⁵⁴ Vaca and Kuzmyak (2005), *Op. cit.*

customers choose to patronize establishments outside the municipality. Although analysis of such effects is beyond the scope of my analysis, such considerations may be relevant for City Council's decision.

VI. DISCOUNT RATE

A. OVERVIEW

One of the key value drivers in a discounted cash flow (DCF) valuation is risk; slight changes in the riskiness of future cash flows can cause major variations in the overall value of the cash flows. Accordingly, it is important to accurately quantify risk when undertaking a DCF valuation. The risk component of the DCF valuation is reflected in the application of a "risk-adjusted discount rate," which is defined as the rate necessary to determine the present value of a stream of uncertain future cash flows. More specifically, the risk-adjusted discount rate is calculated to reflect the amount of undiversifiable risk in a business's cash flows. It is widely determined by adding the risk-free rate, which is generally equated to the return on short-term U.S. Treasuries, and a risk premium, which is based on an analysis of the risk characteristics of the particular investment or project being evaluated. Another common approach used to calculate a risk-adjusted discount rate is to determine the weighted average cost of capital (WACC) for the activity in question.

Determining the appropriate risk-adjusted discount rate to apply to the stream of future cash flows from the City of Pittsburgh's parking assets is complicated by at least the following factors:

- The length of time of the projected cash flows. It is very difficult to predict anything successfully fifty years into the future. Technological advancements, changes in consumer tastes and preferences, and wholesale sociological changes are just some of the events that could feasibly occur during the next fifty years that could dramatically affect the ability of an operator to realize the stream of projected cash flows;
- The assets are unique and there are very limited comparable transactions upon which to rely;
- There is little to no publicly available data on companies that solely own and operate parking facilities; and
- There is little to no publicly available information on the capital structure and cost of capital of the seven concessionaires bidding for the City's parking assets.

To overcome these obstacles, I undertook a multifaceted approach to calculating the risk-adjusted discount rate in this matter. I considered the cost the City would incur to issue a revenue bond related

to its parking assets, the weighted average cost of capital (WACC) rates that we were able to determine for parking companies, the WACC rates of the concessionaires bidding for the Assets, and the discount rates used in comparable transactions. To these analyses, I applied my general understanding of discount rates and the risks associated with these assets, which I developed over years of experience, study and research. I weighted each of these analyses according to my assessment of their predictive value.

B. COST OF ISSUING REVENUE BONDS

In supporting the discount rate it selected for valuing the Chicago parking assets, the William Blair report suggests that answering the hypothetical question, “If the City issued bonds secured only by the net operating revenue of the Parking Assets (i.e. no general obligation backing by the City), what interest rate would they pay on those bonds?” I, too, believe that answering this question is one of the most effective means by which to determine the appropriate discount to apply to the stream of future cash flows generated by the Pittsburgh parking assets. Accordingly I undertook such an analysis.

During the course of my work, the City provided me with a schedule that outlines the bond debt service for a \$180M general obligation, taxable pension bond, as if it issued on August 16, 2010 and matured 20 years later.⁵⁵ I determined that the effective annual interest rate on this bond is 6.18%. Using data from Bloomberg, I then determined the basis point differential between general obligation bonds and revenue bonds for BBB-rated municipalities, which based on Pittsburgh’s Comprehensive Annual Financial Report, dated December 31, 2009, is consistent with Pittsburgh’s rating.⁵⁶ Adding the basis point differential, I calculated an interest rate of 7.84%. I believe this rate is most germane to our overall discount rate analysis; however, I thought it prudent to incorporate additional data into the analysis as a quality check. Accordingly, I gave this portion of my discount rate analysis a 70% weighting.

C. PARKING COMPANY WACC RATES

There are various data sources that calculate WACC for publicly traded companies (i.e., companies with publicly available financial information). Two such data sources that are widely relied upon by investment bankers, consultants, academicians, and corporations are Bloomberg and Capital IQ. FSG has a license for both Bloomberg and Capital IQ, which I queried for the WACC rates of companies that own, operate, and/or provide services for parking assets. In total, I compiled WACC data on eighteen

⁵⁵ Based on conversations with Bill Urbanic, a 20-year maturity is the most likely time period for a new bond issued by the City related to its parking assets.

⁵⁶ See Pittsburgh’s Comprehensive Annual Financial Report, December 31, 2009, p. 120.

such companies. While none of these companies is perfectly comparable to the City's parking operation, they, in aggregate, represent an industry composite. The composite's WACC rate (the average WACC rate of all eighteen companies) is 8.07%. Due to the imprecise nature of these corporate comparisons, I gave the composite WACC calculation a 10% weighting in my overall discount rate analysis.

D. CONCESSIONAIRE WACC RATES

Although the costs of capital for the concessionaires are not necessarily consistent with the cost of capital that the city would incur to fund the Assets, I do believe they are informative to my discount rate analysis; primarily because these companies will be evaluating the Assets and bidding on them in relation to the costs they will incur to fund the lease acquisition. To determine these rates, I again queried Bloomberg and Capital IQ. Unfortunately, I was only able to generate WACC data on two of the seven concessionaires, as the majority of them are privately held companies and publicly available financial data on them are scarce. According to Capital IQ, the WACC rates for JP Morgan and KKR are 4.4% and 8.7%, respectively, which together average 6.55%. I weighted the predictive value of this portion of my analysis at only 10%, consistent with the parking company WACC rates.

E. COMPARABLE TRANSACTIONS

The last category I considered in my discount rate analysis was comparable transactions. The only relevant and comparable transaction on which I was able to obtain discount rate data was the 2009 lease transaction involving the City of Chicago's parking meters. The documents I reviewed in connection with that transaction provided three different discount rates; two from the William Blair report and one from the Inspector General's report. The rates provided were 14%, 10% and 7%, respectively. The William Blair report highlighted a number of fatal flaws in the Inspector General's report which render its rate unreliable. Accordingly, I relied only on the Blair Report's discount rates for my analysis.

Upon further scrutiny, the discount rates in the Blair Report were built upon the 30-year U.S. Treasury bond rate at the time of its analysis, and a risk premium that considered the following:

- The concessionaire assuming considerable risks;
- A 3% to 5% risk premium for a diversified stock portfolio;
- A 3% to 5% risk premium for A-rated corporate bond; and
- A BBB+ rating, at best, for the Chicago Parking System.

I adjusted the Blair Report's rates by using a current 30-year U.S. Treasury Bond rate for the risk-free rate and adjusted the risk premium downwards by 1.5% to reflect current market conditions and the fact that I do not view the risks assumed by the concessionaire as relevant, as my analysis focuses on the risks to the city. The City's risk is not as significant, because as the owner of the assets, they can mitigate demand and supply shocks more readily than concessionaires.

While the Chicago transaction is comparable, it does not include parking garages (only meters), it is not contemporaneous with the Pittsburgh transaction, and it does not provide a precise discount rate proxy for the Pittsburgh parking assets, even after adjustments. As such, I also weighted the predictive value of this category at only 10%.

F. DISCOUNT RATE RESULTS

Based on the analysis discussed above, I estimated the appropriate risk-adjusted discount rate to apply to the stream of expected future cash flows from the City's parking asset to be 8%, with a high/low range for simulation purposes of 7%-10% (**Exhibit V**).

VII. FREE CASH FLOW

A. FREE CASH FLOW FROM GARAGES

The garage assets comprise 12 parking garages with 8,195 total spaces plus the capacity to "stack" an additional 775 spaces.⁵⁷ Garages generate both hourly parking fees and monthly lease revenues. Estimated parking garage revenues approximate \$26.7 million in fiscal year 2010.⁵⁸

REVENUES

Calculations of future revenues from garage facilities for the period 2011 through 2015 employed a weighted average price increase, estimated elasticity of demand, and estimated growth rates.

- Weighted average price increase: Schedule 9 of the Pittsburgh Parking Facilities System Concession and Lease Agreement specifies annual price increases per garage beginning on January 1 for the period 2011 through 2015. The price increases are not uniform across the different usage categories, e.g., a monthly lease may increase by 10% while the hourly rate may increase by 50%. Accordingly, I derived a garage-specific weighted average price increase for

⁵⁷ "Stacking" is the practice of parking vehicles in fully occupied garages access ramps and throughways. Vehicles owners leave a set of keys with the attendant in order to reorder cars as needed during the day.

⁵⁸ FY 2010 Internal Financials through March 31, 2010.

each year by multiplying percentage changes in rates by their respective share of total garage revenues (**Exhibits IV-A.3 and IV-A.4**).⁵⁹

- **Elasticity of demand:** As discussed above, the revenue calculations applied the weighted average price increase through 2015, accounting for price elasticity of demand valued at -0.3 for all garage facilities.
- **Annual growth rate:** Due to external macroeconomic conditions, I assumed near-term annual growth rate (years 2011-2015) to be 0%,⁶⁰ with the exception of Grant Street garage, which has an expected growth rate of 5%.⁶¹ For the longer term (2016-2060), I employed a growth rate of 2.0%, primarily reflecting an inflationary adjustment.⁶² I understand that the downtown garages are already close to full capacity, and long-term growth in demand is limited due to lack of space for new office buildings in the downtown area.⁶³

Based on the above, garage revenues for the 2011 through 2060 time period total \$3.112 billion (**Exhibit IV-A.2**).

OPERATING EXPENSES (OPEX)

Projected OPEX for the garage facilities system in FY 2010 is approximately \$7.93 million, excluding taxes and depreciation (**Exhibits IV-A.6, IV-A.7 and IV-A.8**).⁶⁴ I applied a 2.0% growth rate to operating expenses for the 2011 through 2060 time period.

PARKING TAX

In Pittsburgh a parking tax is applied to patrons of any parking facility within the City. The operator acts as an agent for the City and collects the tax from patrons. Therefore the current 37.5% parking tax translates into a 27.273% tax on the revenues of garage facilities. I assumed that this tax rate holds for the duration of the 50-year period.

⁵⁹ Garage Revenues by year and hour.pdf

⁶⁰ FY2010 revenues for the garage system are projected to be approximately the same as FY 2009 revenues (Exhibit III-A.5) and current inflation expectations are low.

⁶¹ Because Grant Street recently opened in 2008, it only had 45% occupancy rates compared with competing garages' utilization of 70% to 100% (Desman Associates' Parking Market Report of Selected Off-Street Parking Facilities, April 2010, p. 36). Grant Street revenues are projected to increase by 20% from FY 2010 to FY 2011 (Pittsburgh Parking Authority FY 2011 Budget). It is reasonable to assume this growth will slow over the next five years as the garage nears capacity.

⁶² 2% long term growth also matches analysis received from Pittsburgh's Budget Office regarding projected annual increase in parking receipts. Parking Tax Revenue Analysis from Mike Strelac.

⁶³ Conversation with Merrill Stabile; Desman Associates' Parking Market Report of Selected Off-Street Parking Facilities, April 2010, p. 46.

⁶⁴ FY2010 Internal Financials through March 31, 2010 with location details.

CAPITAL EXPENDITURES

PPA's FY 2010 budget discloses expected capital expenditures plus "Proposed Capital Needs." I extracted expected and proposed capital expenditures related specifically to the garage facilities and averaged these to estimate FY 2010 capital expenditures (**Exhibit IV-A.11**). I increased capital expenditures by 2% per year beginning in 2011.

In addition to base capital expenditures, I also calculated capital expenditures in relation to the CLA's required \$50 million scheduled rehabilitation of the Fort Duquesne and Sixth Garage, the Smithfield Liberty Garage, and the Ninth and Penn Garage, by 2017, 2025, and 2025, respectively.⁶⁵ I apportioned the \$50 million across the three garages based on their respective number of parking spaces, and then increased the costs by 2% inflation per year. I assumed the capital expenditure associated with a garage rehabilitation would be incurred over a two-year period (**Exhibit IV-A.9 and A.10**).

FREE CASH FLOW

Based on the above, free cash flow for the garage system totals \$1.198 billion for the period 2011 through 2060 (**Exhibit IV-A.1**). Discounting this at an 8% rate results in net present value of **\$199.8 million** as summarized in Table 1 below.

Table 1: Valuation of Parking Garages (\$ millions)

<u>Description</u>	<u>2011 - 2060</u>
Total Revenues	\$ 3,112.20
OPEX	684.14
Taxes	848.78
CAPEX	381.69
Free Cash Flow	\$ 1,197.59
Present Value of FCF @ 8%	\$ 199.83

A simple representation of the sensitivity of the discounted free cash flows to the discount rate and the elasticity of demand is shown in Table 2 below.

⁶⁵ Mayor's press release, "City Releases Final Parking Proposal" dated August 11, 2010, (http://www.city.pittsburgh.pa.us/mayor/html/city_press_releases.html); Concession and Lease Agreement dated August 11, 2010, pp. 58-60.

Table 2: Present Value of Garage FCF (\$ millions)

		Discount Rate		
		7%	8%	10%
Elasticity	-0.1	\$ 294	\$ 251	\$ 191
	-0.3	\$ 234	\$ 200	\$ 152
	-0.5	\$ 179	\$ 153	\$ 117

Values range from a low of \$117 million to a high of \$294 million.

SIMULATION

The \$199.83 million represents a point estimate drawn from a potential range of values based on exact inputs for variables. To estimate a likely range of values for the garage assets, I assigned the following range of values for sensitive variables, the discount rate, elasticity of demand, and growth rate:

Table 3: Simulation Variables for Garage Model

Variable	Low	Medium	High
Elasticity	-0.1	-0.3	-0.5
Discount rate	7%	8%	10%
Growth rate	1%	2%	3%

I selected a triangular distribution for each variable, indicating that the “medium” value was also the most likely value. I also designated perfect correlation between elasticity’s of downtown garages, i.e., they all experience the same elasticity in each simulation but elasticity can vary from one simulation to the next. Elasticity of demand for Forbes and Shadyside garages was assumed to be independent of all other garages.

Based on the above, running 10,000 simulations produced a “bell curve” distribution of expected values, with a 90% confidence interval ranging from \$152.4 million to \$236.4 million (**Exhibit VI-A**). The discount rate and elasticity of downtown garages account for approximately 46.5% and 47.9% of the variation, respectively.

B. FREE CASH FLOW FROM METERS

The meter assets comprise approximately 7,000 on-street meters plus 1,700 spaces in 32 off-street metered lots.⁶⁶ In addition, the City estimates that 922 new on-street meters could be added.⁶⁷ While on-street meters generate only hourly parking fees, off-street metered lots generate hourly parking fees plus monthly lease fees. On-street and off-street meters combined are expected to generate revenues of approximately \$6.5 million in fiscal year 2010.⁶⁸

REVENUES

Calculations of future revenues from parking meters for the period 2011 through 2015 focused on the following:

- Hourly and lease revenues from off-street metered parking lots. **(Exhibits IV-B.2 and IV-B.3)**
- Hourly revenues from current and new on-street metered spaces. I assumed that the 922 new spaces would generate revenues beginning April 1, 2011.⁶⁹ Per the Concession and Services Agreement, the new spaces would generate demand equal to that of other meters in the same geographic area.⁷⁰ **(Exhibits IV-B.4, IV-B.6 and IV-B.7)**
- Hourly revenues from expanded hours of enforcement for on-street metered spaces – enforcement hours will be increased as of January 1, 2011 to include 6 PM to 10 PM each evening.⁷¹ Parking demand during expanded hours was based on utilization figures from Schedule 10 of the Pittsburgh Metered Parking System Concession and Services Agreement **(Exhibit IV-B.5).**

In addition to the above three components of meter revenues, hourly revenues will increase as PPA converts single-space meters to multi-space, “pay-and-display” meters⁷² **(Exhibit III-B.8)**. PPA provided a 10-year conversion plan indicating which meters will be converted over the next ten years. The cost to purchase and install a multi-space meter ranges from \$12,000 to \$18,000; the valuation model uses an

⁶⁶ Schedule 10 of the Pittsburgh Metered Parking System Concession and Services dated August 11, 2010; Schedule 4, Table 1 of the Pittsburgh Facilities System Concession and Lease Agreement dated August 11, 2010.

⁶⁷ Schedule 15 of the Pittsburgh Metered Parking System Concession and Services Agreement dated August 11, 2010.

⁶⁸ Enforcement Meter Services 2010 General Fund Budget.

⁶⁹ Per discussions with Bill Urbanic and Mike Strelac, City Council Budget Office.

⁷⁰ Schedule 10 of the Pittsburgh Metered Parking System Concession and Services Agreement applies equivalent utilization figures for new and existing spaces.

⁷¹ Seven geographic areas comprising 1,046 metered spaces will be excluded from the expanded hours, including East Liberty, Lawrenceville, Mellon Park Area, Carrick, Beechview, Allentown and the West End. Pittsburgh Metered Parking System Concession and Services Agreement, Schedule 9.

⁷² See Desman Associates’ Financial Analysis of Parking Assets of the Public Parking Authority of Pittsburgh for an explanation of why multi-space meters enhance revenues (pp. 39-43).

average cost of \$15,000.⁷³ Based on independent research and Desman Associates' Financial Analysis of the Parking System, I assumed a 25% increase in revenues from the conversion. Per Desman, Pittsburgh experienced a weighted average revenue increase of 44% from conversion to multi-space meters, with a range of 2% to 638%, depending on location.⁷⁴

The revenue calculations described above applied the increased fees specified in the Concession agreements through 2015, accounting for price elasticity of demand of -0.3. For the period 2017 through 2060, I grew revenues at an annual rate of 2%. Revenues for the 2011 through 2060 time period total \$1.392 billion (**Exhibit IV-B.1**).

OPERATING EXPENSES

The meter system has low operating expenses and high operating margins compared to the garage facilities. Projected OPEX for the meter system in FY 2010 is approximately \$1.2 million, excluding taxes (**Exhibit IV-B.9**).⁷⁵ After increasing annual operating expenses to account for servicing 922 new spaces, I then grew the operating expenses at 2% per year. I calculated parking taxes at the current rate of 27.273% of revenues for the duration of the 50-year period.

CAPITAL EXPENDITURES

PPA's FY 2010 budget discloses "Proposed Capital Needs" for FY 2010 through FY 2019. PPA estimates specific capital needs pertaining to multi-space meters as well as meter parts/inventory. I increased the capital requirements for meter parts/inventory to account for 922 new spaces in the meter system, and then computed additional capital expenditures related to conversion of single space to multi-space meters (**Exhibit IV-B.10**).

FREE CASH FLOW

Based on the above, free cash flow for the meter system totals \$1.153 billion for the period 2011 through 2060 (**Exhibit IV-B.1**). Discounting this at an 8% rate results in net present value of **\$201.33 million** as summarized in Table 4 below.

⁷³ Conversation with David Onorato.

⁷⁴ Financial Analysis of Parking Assets of the Public Parking Authority of Pittsburgh, Desman Associates, April 2010, p. 43. Presumably Pittsburgh's early meter conversions were in areas expected to achieve the highest results and future areas may not experience similar increases.

⁷⁵ Enforcement Meter Services 2010 General Fund Budget.

Table 4: Valuation of On-Street and Off-Street Meters (\$ millions)

<u>Description</u>	<u>2011 - 2060</u>
Off-street Revenues	\$ 213.02
On-Street Revenues	1,179.25
Total Revenues	\$ 1,392.27
OPEX	117.85
Taxes	58.10
CAPEX	63.67
Free Cash Flow	\$ 1,152.65
Present Value of FCF @ 8%	\$ 201.33

The sensitivity of the discounted free cash flows to the discount rate and the elasticity of demand is shown in Table 5 below.

Table 5: Present Value of Meter FCF (\$ millions)

		Discount Rate		
		7%	8%	10%
Elasticity	-0.1	\$ 352	\$ 301	\$ 228
	-0.3	\$ 235	\$ 201	\$ 154
	-0.5	\$ 148	\$ 127	\$ 98

Values range from a low of \$98 million to a high of \$352 million.

SIMULATION

As described above for the garages, the \$201.33 million valuation for the meter system represents a point estimate drawn from a potential range of values based on exact inputs for variables. I used the same likely range of values for the three sensitive inputs as described above for the garages, with the exception being a “low” elasticity of demand of -0.2 instead of -0.1. In addition, I assigned values of 20% (low), 25% (medium) and 35% (high) for the expected increase in revenues from converting to multi-space meters.

Based on the above, running 10,000 simulations produced a “bell curve” distribution of expected values, with a 90% confidence interval ranging from \$133.8 million to \$234.3 million (**Exhibit VI-B**). The discount rate and elasticity account for approximately 26.8% and 67% of the variation, respectively.

VIII. APPLICATION OF RESULTS

The decision to lease or keep the parking assets is not a simple comparison of the valuation results above to the bids that will be received, i.e., if the bids are higher than the valuation results, the lease option dominates and vice versa. Rather, interpretation and application of the valuation results to the three scenarios also requires assessment of other pros/cons and opportunity costs, some of which may be qualitative in nature versus quantitative. Although many of these issues lay beyond the scope of this report, I briefly outline and discuss various factors relevant to the decision below.

A. RETAIN THE PARKING ASSETS AND ALLOW FOR STATE TAKE-OVER OF THE PENSION

In the event PPA retains the parking assets and implements Concession pricing, PPA can expect to generate the \$400 million described above. However, without a large infusion of funds into the pension, the state will take over the pension at the end of 2010. Based on a 7.5% rather than 8% rate of return on the assets, I understand that state take-over would increase the City’s mandatory minimum obligation (“MMO”) to the pension from \$45 million in 2011⁷⁶ to approximately \$72 million,⁷⁷ an increase of \$27 million. This \$27 million does not represent a true incremental cost, as it narrows the gap between annual pension contributions and expenses; Pittsburgh will bear this cost regardless of whether the state takes over the pension or not. Reducing pension contributions to \$45 million next year when expected payments are approximately \$80 million simply shifts the problem to subsequent years. True incremental costs associated with a state take-over include \$2 million per year in administrative costs, reduction in contributions required from current employees, modifications to the Deferred Retirement Option Plan, as well as the possibility for increases in benefits which the City would be required to fund.

Although the state take-over appears to bear significant costs, it also brings the following benefits:

- Avoids the need for, and cost of, a new bond issuance;
- Preserves the City’s option to raise future capital backed by parking assets;

⁷⁶ Per the Mayor’s latest announcement, if \$217 million is paid into the pension by the end of 2010, then next year the City will only contribute \$45 million to the pension.

⁷⁷ Based on the State accounting for pension assets and liabilities using a 7.5% rate of return versus Pittsburgh’s application of an 8% rate of return.

- Grants PPA continued control of the relationship between enforcement and parking revenues; and
- Enables Pittsburgh to retain control over assets that will generate estimated annual future revenues in excess of the \$27 million annual cost by approximately 2026 or earlier, depending on elasticity of demand (**Exhibits VII-A and VII-B**).

Notwithstanding the above, the \$27 million increase in funds is a meaningful amount of additional funds for Pittsburgh to raise in 2011 and the uncertainty regarding future costly changes to the pension fund remains a legitimate concern. However, for the past years, the City has been funding at a rate of \$60 million per year, so the delta over past years is only \$12 million. An important question to consider when evaluating this option is whether the State is more or less likely to constrain benefits in relation to the City.

B. RETAIN THE PARKING ASSETS AND ISSUE A BOND

As an alternative to state take-over, PPA may issue a \$180 million 20-year bond to infuse funds into the pension to achieve 50% funded status by December 31, 2010. Under this scenario, the parking assets will generate the values modeled above, less the present value of the current and new debt service requirements, as outlined in Table 6 below.

Table 6: Value of Parking Assets Net of Debt Service

Present Value of Parking Assets (50 years)	\$ 401.2 million
Present Value of Current Debt	76.7 million
Present Value of New Debt	180.0 million
Net Value of Parking Assets (excluding transaction costs)	\$ 144.5 million

I understand the \$180 million bond would be a General Obligation Bond; however it would be preferable to demonstrate new parking revenues sufficient to service the new debt. **Exhibit VII-A** calculates \$447 million in new revenues for the 2011 to 2030 time period, which, in aggregate, exceeds the \$306 million required for new debt service however new revenues in the earlier years are less than the required debt service. **Exhibit VII-B** contains a similar calculation of new revenues assuming -0.1 elasticity for downtown garages.

Because of concerns about debt service exceeding new revenues in the earlier years, I conducted simulations of the potential range of undiscounted new parking revenues for each of the first five years.

Using the 90% confidence interval, I computed the maximum and minimum values for the first five years, as shown in the table below (**Exhibit VII-C**).

Table 7: New Parking Revenues Compared to Debt Service, 2011-2015

FY	New Revenues			Debt Service
	Minimum	Mean	Maximum	
2011	\$ 4,080,281	\$ 5,462,463	\$ 6,743,545	\$ 15,282,863
2012	6,115,722	8,612,547	10,940,833	15,282,600
2013	8,979,172	12,878,883	16,591,463	15,279,900
2014	11,314,926	16,483,909	21,493,358	15,281,528
2015	13,866,591	20,463,458	26,939,507	15,281,493
Total	\$ 44,356,693	\$ 63,901,260	\$ 82,708,707	\$ 76,408,383

Under the minimum results, parking revenues fail to exceed new debt service in any of the first five years. The mean and maximum results exceed new debt service in years 2014 and 2013, respectively.⁷⁸

C. LEASE THE PARKING ASSETS

In the event of a long-term lease, PPA will receive the highest bid, less transaction costs, higher annual enforcement costs, and defeasance costs. PPA receives its money upfront, and the Concessionaire assumes risk of revenues falling short of expectations.

Although a lease seems simple, there are numerous collateral issues to consider, including the following:

- PPA may have the opportunity to raise the parking tax to 40%, which could generate an additional \$49 million in present value (**Exhibit VIII**);
- The City will no longer receive the \$1.35 million payment “in lieu of real estate taxes” that PPA currently pays (approximately \$16.5 million in present value⁷⁹);
- The bid represents the upper bound of cash inflow - PPA may have to make future payments back to the bidder to account for excess closure days, ticket enforcement in the first year, various compensation events, etc;
- Future renegotiations are not seamless; there can be substantial costs associated with an underlying need to restructure property rights.
- PPA must honor non-compete zones for garages and meters;
- As the current debt matures, PPA no longer has the option to issue future debt backed by the parking assets until after the lease terminates; and

⁷⁸ Exhibit VII-D calculates the cash flows available to service new debt.

⁷⁹ \$1.35 million * [1-(1.08⁻⁵⁰)]/0.08 = \$16.5 million.

- PPA will have a dramatically reduced role and it is unclear how the organization will be restructured or the costs associated with restructuring. One such cost pertains to PPA personnel. I understand that the Concessionaire may employ some PPA personnel, however, even assuming a “best-case” situation, the Concessionaire would only employ half of the approximately 150 personnel⁸⁰ and the City would be responsible for absorbing the remaining employees.

In addition to the above, there are large potential costs inherent in properly structuring a long-term lease, particularly in the present setting in which it is important to impose restrictions over time on permissible pricing. The meaning of price levels, even if indexed to the CPI, may be difficult to properly define in a long-term contract. One might ask, why restrict pricing at all? In most contexts, a seller would not restrict the pricing that the buyer could charge. But for many reasons this is not most contexts. First, the government is representing the citizens, and while there would be benefits to a sale with intended parking prices, there could be considerable costs to the citizenry that would outweigh the marginal improvement in selling price. Second, exorbitant parking pricing could have devastating impacts on economic activity in the city. Finally, the assets are being sold as a package, potentially providing considerable monopoly power to the buyer. Contractual restrictions on pricing are a way to manage that monopoly. Because of these reasons, among others, contractual restrictions on pricing make sense, however, how do we determine sensible pricing levels for 30, 40 or 50 years down the road as the nature of work evolves? To point to a few specific phenomena, consider the transformation of the work experience from developments in telecommuting, outsourcing, Internet and cell phones. Can we understand or have the wisdom to predict how to calibrate these prices over time?

Even in the short run, given the magnitude of the price hikes envisioned, this strategy may work out quite poorly and prove too disruptive to the local economy. In fact, the City may conclude that it would have been preferable to raise the money in a less distortionary way, such as through general sales or property taxes, for example. If the City retains substantial control of the parking pricing, it could make adjustments to stimulate or respond to economic activity when appropriate (e.g., in the state take-over or bond scenarios). It is one thing for the City to agree to higher, but reversible, parking prices, and another thing to also lock those in for the long run.

A related point is that the spillover between parking revenues and the impact of pricing on business activity may evolve considerably over time—especially reflecting the further development of shopping areas just outside the city (e.g., Waterfront and Waterworks Malls), as well as deeper changes in how

⁸⁰ Conversation with David Onorato.

we shop associated with technology and the Internet. Alternatively, perhaps there will be a major development in mass transit that affects how we live thirty years from now. Even absent such developments, it is certainly clear that different neighborhoods in particular cities have evolved in very different ways over the years so it is quite problematic to be locking in diverse relative pricing patterns based solely on conditions today. Assuming we set optimal parking prices over the next months, or even the next five years, I submit that little is known about how to calibrate these prices far in the future.

D. OTHER CONSIDERATIONS

In addition to understanding the dollar values associated with each possible scenarios, several theoretical issues underlie the decision, such as the costs of bond defeasance and the relationship between enforcement activity and receipt of meter revenues. A brief discussion of these issues follows.

DEFESANCE

Leasing the Assets would require defeasance of the existing PPA bonds to legally extinguish them. In interpreting the costs of the defeasance it is important to recognize that the relevant costs are not the total value of the outstanding bonds that need to be defeased, but rather the "frictional" costs associated with the defeasance. In this respect, it is helpful to understand how a defeasance works. Specifically, in a defeasance the bonds are not currently callable, but need to be effectively extinguished because the proposed transaction would otherwise violate a restrictive covenant. The bond instruments allow extinguishment through a formal legal process called a defeasance. Specifically, Treasury instruments with the corresponding cash flows would be placed in a trust to ensure the payoff of the bonds. To the extent that regularly marketed Treasuries offer excess cash flows, special instruments calls SLGs can be purchased from the Treasury to provide the needed cash flows. However, because of their risk-free and profoundly liquid character (i.e., they provide modest cash flows), Treasuries are very expensive to purchase relative to the cash flows on the municipal bonds. In addition, the Treasury charges premia for the customized SLGs. Finally, an additional cost is that the PPA debt was tax-exempt and the replacement financing by the city would be taxable due to its purpose. Obviously, giving up the opportunity to have outstanding more than \$100,000,000 of tax-exempt debt would be costly to Pittsburgh. The defeasance also is a type of financial restructuring, which can lead to significant fees from financial intermediaries.

Another way to evaluate the cost of the defeasance is to observe that the defeased ("pre-refunded") bonds typically increase in price substantially in the secondary market at the time of the

defeasance because of the elimination of credit risk (at the issuer's expense). This occurs along with fees being paid to financial intermediaries and benefits being derived by the Treasury through the issuance of SLGs (or just even the artificial increase in the demand for marketed Treasuries). Effectively, all of these costs are at the expense of the issuer - it's essentially a zero-sum game between the issuer (PPA), investors and third parties (such as the Treasury and intermediaries receiving fees).⁸¹

ENFORCEMENT

Some important aspects of parking meter pricing are the effort devoted to parking enforcement and the ratio of parking meter fees compared to parking fines. Obviously, the level of parking fines and the perceived likelihood of enforcement will influence the parking decisions of individuals, especially their decisions about how much to pay the meter. The greater the fines and the greater the likelihood of a fine (enforcement), the greater the willingness of the driver to pay the parking meter. When Pittsburgh receives the revenues from parking as well as enforcement, the City can balance the interdependencies between meter revenues, fines and enforcement activity. For example, higher parking prices leads to fewer parking fees paid and greater evasion--hence greater enforcement would be optimal, which would raise enforcement revenue (and costs). To limit evasion, it would also be optimal to increase the fines in response to higher meter prices (to a degree the City's current policy does provide for larger fines when the meters are more expensive). If the municipality were to adjust the meter fees and fines in proportion, then to a first-order the optimal enforcement effort would not differ because the extent of evasion would not change.⁸² This discussion illustrates the presence of significant interdependencies between the pricing of parking meters and enforcement activity and pricing. Indeed, I would anticipate that these relationships could change over time and with changes in economic conditions.

As in the above case, when the same entity receives both the parking meter revenues and enforcement proceeds (and pays those expenses), the tradeoffs for pricing are rather different than when the parking revenues go to a different party--though the parking customers will evaluate their decisions similarly. Some of the benefit of larger fines and/or greater enforcement is that these would lead to greater payment of meter fees. In an environment in which the parking assets have been sold or leased long-term, the City would not derive much benefit from the adjustment to greater enforcement

⁸¹ This zero-sum perspective for understanding whether the municipality benefits from a defeasance was first applied in a related context by Robert Dammon and I ("An Analysis of the Advance Refunding of Municipal Debt," Carnegie Mellon University, April 1993).

⁸² There likely would be secondary effects in this situation since the higher prices would be accompanied by a decline in the demand for parking service, so the marginal product from enforcement activity would decline and it would be optimal to scale back enforcement.

or higher fines. Indeed, after selling or leasing the parking assets the City's incentive would be to reduce parking enforcement expenditures because the City would not receive the marginal benefits from higher meter payments. To address this issue, the Concession agreements specify minimum enforcement levels and activity, including a substantial increase in parking enforcement (ten new enforcement employees). It is certainly sensible in my view for the underlying contracts to reflect that. Nevertheless, there is a real contractual problem and inefficiency in specifying minimum tradeoffs fifty years ahead. One striking provision is that the City could reduce the ratio of fine to hourly meter charge to about eight to one without sanction. It is easy to imagine that this will influence unfavorably the pricing in the contract due to a bidder expecting such a reduction!

IX. CONCLUDING COMMENTS

The discussion in Section III about the underlying context establishes that while the characteristics of the pension underfunding problem in Pittsburgh may be specific (both the level of underfunding and the state contribution mandate), the broader problem of underfunding is now relatively pervasive in state and local government finance. In many jurisdictions the sale and privatization of assets or the borrowing of funds is being viewed as a “solution” to the underfunding problem. It is important to frame and reflect upon the issues from this broader perspective. This suggests that one should ask why either leasing the assets or borrowing funds would constitute a “solution” to the economic problem of underfunding.

A. BORROWING

ECONOMICS OF BORROWING

Would borrowing funds help solve the economic problem faced by a jurisdiction with an underfunded pension plan? It would if the money did not need to be repaid (which is analogous to just putting extra resources into a plan). However, borrowed funds need to be repaid. Therefore, the interest rate cost of borrowing, inclusive of transaction costs, must be less than the returns being earned in the pension plan for the jurisdiction to be better off by borrowing and contributing the funds to the pension. It is typically the case, however, that the borrowing rate, inclusive of transaction costs, exceeds the lending rate. Accordingly, jurisdictions would realistically be made worse off by this type of funding structure.

I recognize that the natural rejoinder to this assertion is to argue that the pension would be able to earn more on the borrowed funds than the cost of borrowing. But this is certainly not true, at least in a

risk-adjusted sense. There is no sense in which it is reasonable to assume that the pension is able to earn more with the borrowed funds than the government's cost of borrowing *after adjustment for risk*.

THE MEANING OF RISK

Many laymen have a difficult time grappling with the meaning of risk, but the last several years offer a valuable context for understanding the essence of risk. Risk in financial markets, especially the types of risk that the market rewards through payment of risk premiums, is not simply idiosyncratic variability on individual assets. Instead, risk premiums and heightened expected returns are associated with the realization of overall risks in our financial markets and the economy as a whole. The last few years are illustrative—when the value of risky investments declined, the value of governmental pension assets declined, and the broader economy and government revenue weakened as well. This is exactly the scenario in which a government is least able to absorb the adverse shock of a reduced pension value.⁸³ In other forms, similar issues face non-profit organizations with significant endowment funds—when endowment investing does poorly in the aftermath of market declines is exactly when the non-profit organizations have the greatest needs, e.g., universities face greater demands for financial aid when the economy is doing poorly.

CONCLUSION ON BORROWING

Borrowing money in the capital market to fund the pension commitment does transform (somewhat soft governmental) pension pledges into hard obligations of taxpayers. Such market obligations are even harder to renegotiate than pension commitments with governmental unions. The resulting transformation places the taxpayers more directly “on the hook” for the pre-existing pension benefits. This way of looking at the problem suggests that if the taxpayer representatives are to voluntarily offer significant additional funding into the municipal pension plan, they may wish to insist on appropriate concessions from the beneficiaries. Given the dramatic extent of underfunding of many governmental plans (not just Pittsburgh's), it is obvious that beneficiaries should already be aware of the riskiness of their claim. The broader discussion of the issues in the current financial context both for domestic pension plans and even with respect to pension obligations in other countries, such as Greece, also highlight the obvious risks that beneficiaries face.

⁸³ It is important to note that both the aggressive investing of government pension assets and the underfunding of these plans is pervasive around the country. This undoubtedly reflects, at least in part, the desire of political leaders to approve greater nominal pension benefits than could otherwise be easily justified.

In conclusion, borrowing does not really resolve the pension underfunding problem, it simply makes the taxpayer directly responsible for the amount borrowed, i.e., reduces the risks borne by the beneficiaries and increases the taxpayer's obligation. Moreover, it is generally not cost-effective on a risk-adjusted basis.

B. ASSET SALE OR LEASE

Another solution to help fund pension liabilities is selling or leasing government assets (given reasonable interest rates, a long-term lease can be close to a sale). This is the idea that underlies the potential leasing of the Pittsburgh parking assets, which would involve a one-time infusion that would cover roughly one-third of the current funding shortfall. Much of the analysis above regarding borrowing carries through in parallel to this analysis.

The traditional way that a lease would be structured would be as an annual lease payment (perhaps even indexed), but that would neither result in an immediate infusion into the pension plan nor meet the state's condition to avoid plan take-over. Accordingly, the City has proposed a lease structure that entails a one-time infusion. This is essentially a way to borrow against the Assets—pointing to the parallel to the above discussion about borrowing. Absent the artificial constraint imposed by the state, the necessity of an up-front payment, per se, is odd—after all, receipt of the up-front payment comes at the expense of a substantial diminution of the City's ability to contribute to the plan over time due to reduced parking revenue and a reduced resource base. This leaves open the question about whether leasing the Assets is a bad thing in isolation.

While leasing the Assets would provide a short-term relief from the State's mandate, there would be considerable costs associated with exercising this option, potentially much greater than the costs of borrowing (see Section VIII.C). Additionally, there is a concern about whether the lease price would constitute a "fire sale." Frankly, it's hard to judge whether or not this last concern is valid, but it will be important to compare the values that emerge from the bidding to those that I estimate in this report, and it is important to ensure that the bidding structure is one that will compete away excess return opportunities for the concessionaires. While "seven bidders" seems like a healthy amount of competition, it's certainly difficult to judge ex ante—especially given that the seller (the City) appears to be strongly motivated. Moreover, unless the concessionaire has the ability to generate significantly more cash flow from the Assets than the City can generate, it is unlikely that the City will realize its full value of the Assets through a long-term lease.

C. CONCLUSION

While both the asset lease and the bond issuance provide funds for the pension plan by monetizing an increase in parking rates over time, neither scenario resolves the long-run issues:

- Underfunding will continue and indeed in most governmental pension plans the amount of underfunding is understated;
- An infusion of funds into the pension plan will likely lead to more risk-taking and leverage that the City can ill afford;
- The City could easily face a state takeover in the future, if pension funding again drops below 50%; and
- An infusion of resources does not resolve the dollar mismatch between the assets and liabilities in the pension plan.

In summary, the State of Pennsylvania's insistence that the City's pension receive a massive cash infusion by the end of 2010 forces the City to choose between three undesirable and unhelpful options. The question that the City's leaders are left to answer is "Which option is the lesser of the evils?" While this report provides an economic framework and some financial guidance to help them answer this question, many of the economic variables are simply unknown, and each of the three options confronting the City has unique qualitative factors, as outlined above, that must be carefully considered.

Respectfully submitted, September 24, 2010



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