Real Return Investments as a Tuition Hedge: Availability Issues

THELG Monograph

92-4

Prof. Lewis J. Spellman
Department of Finance
The University of Texas at Austin
Austin, TX 78712
(512) 471-4368

$5.00
University of Houston Law Center/Institute for Higher Education Law and Governance (IHELG)

The University of Houston Institute for Higher Education Law and Governance (IHELG) provides a unique service to colleges and universities worldwide. It has as its primary aim providing information and publications to colleges and universities related to the field of higher education law, and also has a broader mission to be a focal point for discussion and thoughtful analysis of higher education legal issues. IHELG provides information, research, and analysis for those involved in managing the higher education enterprise internationally through publications, conferences, and the maintenance of a database of individuals and institutions. IHELG is especially concerned with creating dialogue and cooperation among academic institutions in the United States, and also has interests in higher education in industrialized nations and those in the developing countries of the Third World.

The UHLIC/IHELG works in a series of concentric circles. At the core of the enterprise is the analytic study of postsecondary institutions—with special emphasis on the legal issues that affect colleges and universities. The next ring of the circle is made up of affiliated scholars whose research is in law and higher education as a field of study. Many scholars from all over the world have either spent time in residence, or have participated in Institute activities. Finally, many others from governmental agencies and legislative staff concerned with higher education participate in the activities of the Center. All IHELG monographs are available to a wide audience, at low cost.

Programs and Resources

IHELG has as its purpose the stimulation of an international consciousness among higher education institutions concerning issues of higher education law and the provision of documentation and analysis relating to higher education development. The following activities form the core of the Institute’s activities:

Higher Education Law Library

Houston Roundtable on Higher Education Law

Houston Roundtable on Higher Education Finance

Publication series

Study opportunities

Conferences

Bibliographical and document service

Networking and commentary

Research projects funded internally or externally
REAL RETURN INVESTMENTS AS A TUITION HEDGE: AVAILABILITY ISSUES

Lewis J. Spellman*

I. Introduction

The quest for the "riskfree lunch" has been extended to college tuition. The Michigan plan (MET), and other prepaid college tuition plans like it, has justifiably caused its advocates to be proud of its adoption. But now faced with the practical implementation of these programs, there are some doubts being expressed (Horvitz [1990]; Lehman [1990]). The question that appears to be the cause of reflection is: should one be proud or fearful if the prepaid college tuition plan sells well in the marketplace? Harder looks are being taken at the possibility that an embarrassing bankruptcy might have been legislated.

If the plan sells well there are two likely reasons. First, the plan might be underpriced with too low a prepaid tuition fee. The underpricing could result from unrealistic assumptions regarding the ability of the fund’s assets to realize inflation beating returns over the long haul. This would eventually lead to a bankruptcy when the tuition plan is unable to make payment on its obligations. A bankruptcy in turn would cause future legislatures to be faced with either a repudiation or a bailout. A bailout would result in intergenerational wealth transfers affecting those not wishing to be burdened with what in effect had become a statewide college scholarship program. This intergenerational wealth transfer paid through general taxation in turn would put a damper on the state’s economic activity.

The second reason the prepaid tuition program might sell in the marketplace is the perceived reduction in financial risk for parents wishing to fund a

*Professor of Finance, The University of Texas, and Chairman, Real Rate Financial, Austin, Texas.
college education. That is, parents have the option of conducting their own investment program with hopes that the returns would be sufficient to generate the necessary future income to pay college tuition. The MET plan or other prepaid college tuition plans (CTPs) on the other hand appear on the face of it to provide the comfort of shifting the risk of not conducting a successful investment program to a state sponsored agency. For unburdening themselves of the risk of not conducting a successful investment program, parents would likely elect the CTP even if it promised a lower expected return.\(^1\)

The participation in the college tuition plan, however, shifts the burden of the financial risk to the state sponsored agency and future legislators and taxpayers (even if there is only an implicit guarantee on the CTP's obligations by the state). This paper focuses on the analysis of the financial risk that the CTPs (and future taxpayers) have accepted and the ability of the CTPs to make good on their promise.

CTPs like many other initiatives at the federal level has arisen out of a concern for providing goods or services considered to have substantial social welfare such as affordable housing. These concerns have led the federal government to create government sponsored financing and government insurance programs. Because these programs accept fees currently but pay benefits perhaps decades later, a bankruptcy might not be obvious for some time but it is incumbent on all involved to take a hard look at the obligations that have been made and make corrections at an early stage rather than when the obligations are due.

To analyze the MET's financial risk, Horvitz (1990) has used an analogy to a bank. That is, the MET program is analyzed much as a bank or an insurance

\(^1\)The expected return differential between the Met plan and a self-investment program is influenced by the outcome of the efforts to shelter the Met's investment income from federal taxation as well as the ability of the beneficiary to use IRA tax-free accumulations to fund tuitions.
company. The analogy is totally appropriate so let us examine the college tuition program as if it were "CTP Bank." The CTP Bank is a very special bank in that it accepts deposits with a very long maturity but with no current interest owed. That is, all interest is accrued until time of withdrawal. This makes its deposits the equivalent of a zero coupon instrument. Technically speaking, the deposit maturities of the bank's obligations are long-term, possibly up to 30 years in some programs but not totally fixed in maturity as there is a window of time during which the funds could be claimed. For early withdrawals there is a very substantial penalty, typically involving the loss of interest perhaps covering many years of accumulated interest. Further discounting of the deposits occurs if they are "put" back to the CTP Bank if the beneficiary does not attend college or attends a private college or perhaps attends a college outside of the state. These "put" discounts on the claims are an important offset to the obligations faced by the CTP Bank.

While all this would be relatively standard in banking and quite manageable and potentially profitable, however, what sets the CTP Bank apart from banking as we typically know it, is that the amount of the bank's obligations or liability is not set by the bank but is indexed to the prices in a service industry over which the bank has no prior knowledge or control -- and in recent years the prices in that service industry have been increasing considerably more rapidly than the overall price index. This raises the pithy question of whether the bank will be able to honor its obligations in the future because there are no tendencies for long-term, high grade investment portfolios to systematically realize returns that exceed the inflation rate.

The ability to beat the inflation rate systematically is the risk that has been shifted to the CTPs. They in turn must seek to shift that risk to those entities able to do so. This risk shifting can be accomplished by acquiring a portfolio of real rate or inflation adjusting financial assets. The need for
this strategy and the efficacy of acquiring a portfolio of real rate investments to protect the financial viability of the CTPs are the focus of this paper.

II. The Promise

It is easy for a bank to promise, but delivery can be more difficult. The college tuition component of the CPI has been increasing at a rate of 9.1% per annum over the decades of the 1970s and 1980s. During this similar two-decade time frame the overall price index has increased by 6.3% (Kroch [1991]). The implication is that the CTP Bank's obligations would need to have grown about 2.7% faster than the CPI grew. The tendency of college tuition to outpace overall inflation might be referred to as a real tuition growth rate.

Over shorter periods of time such as 1986-1990 the Consumer Price Index for educational service as well as tuition per full-time equivalent student outpaced the overall CPI to result in a real tuition growth rate of 3.1%. Both the rate of inflation and the margin by which tuition outpaced overall inflation were substantial. To the CTP Bank, its beneficiaries and the taxpayers, the warning flags are out. There is a serious question of the CTP Bank's ability to service its liabilities if its liabilities were to grow at these high absolute rates as well as these high rates relative to the rate of increase in the CPI.

The reason the warning flags are out is that the growth rates of tuition and the margin by which tuition outpaces general inflation must similarly be realized by the CTP Bank's investment portfolio in order to fulfil the bank's obligations. That is, the CTP Bank's portfolio should earn returns to exceed 3% in real terms in order to meet the bank's obligations.²

²In order to make allowance for the bank's operating expenses its portfolio must grow at rates more rapid than its liabilities. The "put" discounts on the other hand reduce the required real return of 3%. The put discounts likely offset the expenses of the fund so that the CTP's portfolio needs to approximate the real tuition growth rate.
The problem for the CTP Bank is that financial markets often do not generate earnings even equal to the CPI rate of increase let alone produce real growth rates of 3% over a lengthy period of time such as two decades. While on occasion rapid growth rates in financial performance are possible it is also rare that the timing of returns on financial markets would also be systematically related to the timing required by the CTP Bank to repay its obligations.

In essence, the ability to deliver on the CTP's promise hinges on a consistent long-term performance of its portfolio. The CTP's portfolio managers must earn real rates of return on investments that generate consistent and positive real yields of approximately 3%. Long-term average performance is not enough. This is the problem facing the CTP Bank and this is the risk it has accepted. The problem of achieving this result is demonstrated in Table 1 in which real returns or inflation adjusting returns for over-lapping 20-year horizons is shown for stocks, long-term corporate and government bonds, and short-term government bills.

This performance is not easily accomplished because the earnings of investments in financial markets rarely are systematically related to inflation rates and rarely exceed inflation rates on a regular basis. If anything, acceleration of inflation typically causes real portfolio returns to decline, possibly for a decade or more. This is true for long-term debt instruments and sometimes true for equities. The job of the CTP portfolio managers then is actually awesome and one that has not been tackled on a large scale for a prolonged period of time.

III. The Rate of Tuition Inflation: A Digression

Whatever its cause, college educational fees have not only increased, but have increased at a rate that exceeds the overall inflation rate for two decades.
### TABLE 1
COMPOUNDED ANNUAL REAL RETURNS FOR TWENTY-YEAR PERIODS 1961-1988

<table>
<thead>
<tr>
<th>TIME PERIOD</th>
<th>COMMON STOCK</th>
<th>LONG-TERM CORPORATE BONDS</th>
<th>LONG-TERM GOVERNMENT BONDS</th>
<th>SHORT-TERM GOVERNMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1961-1980</td>
<td>2.85 %</td>
<td>-2.12 %</td>
<td>-2.87 %</td>
<td>.05 %</td>
</tr>
<tr>
<td>1962-1981</td>
<td>.89</td>
<td>-2.82</td>
<td>-3.23</td>
<td>.25</td>
</tr>
<tr>
<td>1963-1982</td>
<td>2.29</td>
<td>-1.47</td>
<td>-1.97</td>
<td>.50</td>
</tr>
<tr>
<td>1964-1983</td>
<td>2.16</td>
<td>-1.46</td>
<td>-2.10</td>
<td>.68</td>
</tr>
<tr>
<td>1965-1984</td>
<td>1.53</td>
<td>-1.04</td>
<td>-1.68</td>
<td>.86</td>
</tr>
<tr>
<td>1966-1985</td>
<td>2.30</td>
<td>.31</td>
<td>-.39</td>
<td>.95</td>
</tr>
<tr>
<td>1967-1986</td>
<td>3.93</td>
<td>1.39</td>
<td>.70</td>
<td>1.14</td>
</tr>
<tr>
<td>1968-1987</td>
<td>2.96</td>
<td>1.58</td>
<td>1.00</td>
<td>1.13</td>
</tr>
<tr>
<td>1969-1988</td>
<td>3.24</td>
<td>2.00</td>
<td>1.52</td>
<td>1.20</td>
</tr>
</tbody>
</table>

Source: Stocks, Bonds, Bills and Inflation, Ibbotson Associates, 1988
This surely is the subject of another paper and this author has no comparative advantage in that regard but can offer a few observations.

When the price of a good increases relative to other goods and service this sets off forces to readjust prices in the future. This simply is the mechanism inherent in a market economy with freedom of entry by other producers, by labor and the freedom of demanders to satisfy their education needs more economically. This is why long-term price projections based on historical trends are bound to be incorrect because of the self adjusting mechanisms set off in a market economy.

If the source of tuition inflation is the labor component of college costs this is perhaps understandable because long cycles in accelerated inflation could last a minimum of a half decade as the gestation period to provide incentives, to attract, and to train a faculty member through graduate school is at least five to six years. Over a period of time the relatively higher college wages will attract new trainees who eventually will augment the labor supply and drive down wages. In later years this labor gushes on the market putting downward pressure on college professors' pay scales.\(^3\) Pressures for reduced college tuition inflation from the demand side also exist. If college becomes too expensive there is a moderation of demand causing the price increases to slow down as college-age students find alternative and less costly training.

Another factor influencing college tuition is the long-term prospect for real growth in wages which are the largest component of college costs. If there are productivity gains in the economy this should be reflected in growing real wages and hence pressures for real tuition inflation rates. That is, the basic college wage costs grow at the inflation rate plus the gain in productivity. While one might not think of college professors as capable of achieving productivity gains, if private employment options exist due to a more productive

---

\(^3\)This phenomena is known as a cobweb cycle.
economy, competition for labor will drive college wages along with industry wages for most disciplines. This economic pressure on professorial wages imposes on the CTP Bank the need to achieve returns that exceed the inflation rate. Long cycles in real wage gains are a source of pressure for the tuition plan's portfolio to produce positive real earnings. Though this has not been a source of pressure on the CTP plan in the past decade it might be in the future.

Because of these mechanisms it is foolhardy to project forward the historic college tuition growth rate. It could equal, be less than, or exceed the CPI rate, but what the CTP Bank must be prepared to do is generate positive real returns in its portfolio operations in order for it to be prepared for all eventualities.

IV. The Irony of the Patterns of Real Returns on Financial Markets

The job of the CTP portfolio manager to earn returns equal to the tuition inflation rate in order to insure the survival of the CTP Bank as a viable economic entity is not an easy task as the results of Table 1 indicate. Table 1 illustrates the real returns available to the traditional investment outlets for the CTP funds. A portfolio manager if confronted with the choice of stocks, long-term debt either corporate or government or short-term government debt would likely choose the seemingly less risky long-term debt instruments. However, not only have long-term bonds or short-term bonds not performed to generate consistent 20-year period real returns of 3%, several of the two-decade long periods have generated negative real returns. Only common stocks have come close to realizing over 20-year periods the 3% real inflation tuition rate of the past two decades. This occurred in only 2 of the 9 over-lapping 20-year holding periods.

While the equity returns have been reasonable on average they are less impressive when viewed in terms of their year by year stability. Table 2 shows
<table>
<thead>
<tr>
<th>YEAR</th>
<th>COMMON STOCKS</th>
<th>ASSETS</th>
<th>LIABILITIES*</th>
<th>CHANGE IN CTP NET WORTH**</th>
<th>INFLATION RATE (CPI-U)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>SHORT TERM GOVT BONDS</td>
<td>LONG TERM GOVT BONDS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1966</td>
<td>-10.06%</td>
<td>4.76%</td>
<td>3.65%</td>
<td>6.85%</td>
<td>-3.2%</td>
</tr>
<tr>
<td>1967</td>
<td>24.98</td>
<td>4.21%</td>
<td>-9.19%</td>
<td>6.54%</td>
<td>-15.73%</td>
</tr>
<tr>
<td>1968</td>
<td>11.06</td>
<td>5.21%</td>
<td>-0.26%</td>
<td>8.22%</td>
<td>-8.48%</td>
</tr>
<tr>
<td>1969</td>
<td>-8.50</td>
<td>6.58%</td>
<td>-5.08%</td>
<td>9.61%</td>
<td>-14.69%</td>
</tr>
<tr>
<td>1970</td>
<td>4.01</td>
<td>6.53%</td>
<td>12.10%</td>
<td>8.99%</td>
<td>3.11%</td>
</tr>
<tr>
<td>1971</td>
<td>14.31</td>
<td>4.39%</td>
<td>13.23%</td>
<td>6.86%</td>
<td>6.37%</td>
</tr>
<tr>
<td>1972</td>
<td>18.98</td>
<td>3.84%</td>
<td>5.68%</td>
<td>6.91%</td>
<td>-1.23%</td>
</tr>
<tr>
<td>1973</td>
<td>-14.66</td>
<td>6.93%</td>
<td>-1.11%</td>
<td>12.30%</td>
<td>-13.41%</td>
</tr>
<tr>
<td>1974</td>
<td>-26.47</td>
<td>8.00%</td>
<td>4.35%</td>
<td>15.70%</td>
<td>-11.35%</td>
</tr>
<tr>
<td>1975</td>
<td>37.20</td>
<td>5.80%</td>
<td>9.19%</td>
<td>10.51%</td>
<td>-1.32%</td>
</tr>
<tr>
<td>1976</td>
<td>23.84</td>
<td>5.08%</td>
<td>16.75%</td>
<td>8.31%</td>
<td>8.44%</td>
</tr>
<tr>
<td>1977</td>
<td>-7.18</td>
<td>5.12%</td>
<td>-0.67%</td>
<td>10.27%</td>
<td>-10.94%</td>
</tr>
<tr>
<td>1978</td>
<td>6.56</td>
<td>7.18%</td>
<td>-1.16%</td>
<td>12.53%</td>
<td>-13.69%</td>
</tr>
<tr>
<td>1979</td>
<td>18.44</td>
<td>10.38%</td>
<td>-1.22%</td>
<td>16.81%</td>
<td>-18.03%</td>
</tr>
<tr>
<td>1980</td>
<td>32.42</td>
<td>11.24%</td>
<td>-3.95%</td>
<td>15.90%</td>
<td>-19.85%</td>
</tr>
<tr>
<td>1981</td>
<td>-4.91</td>
<td>14.71%</td>
<td>1.85%</td>
<td>12.44%</td>
<td>-10.59%</td>
</tr>
<tr>
<td>1982</td>
<td>21.41</td>
<td>10.54%</td>
<td>40.35%</td>
<td>7.37%</td>
<td>32.98%</td>
</tr>
<tr>
<td>1983</td>
<td>25.51</td>
<td>8.80%</td>
<td>0.68%</td>
<td>7.30%</td>
<td>-6.62%</td>
</tr>
<tr>
<td>1984</td>
<td>6.27</td>
<td>9.85%</td>
<td>15.43%</td>
<td>7.45%</td>
<td>7.98%</td>
</tr>
<tr>
<td>1985</td>
<td>32.16</td>
<td>7.72%</td>
<td>30.97%</td>
<td>7.27%</td>
<td>23.70%</td>
</tr>
<tr>
<td>1986</td>
<td>18.47</td>
<td>6.16%</td>
<td>24.44%</td>
<td>4.63%</td>
<td>19.81%</td>
</tr>
</tbody>
</table>

*Presuming a 3.5% real tuition growth rate.
**Growth rate of Long Term Govt Bonds less Growth Rate of Liabilities.
the instability year by year in the total returns of these alternative investments even before correcting for inflation. The total returns take account of not only the current returns of interest payments and dividends but also the capital gains and losses of the portfolio (as if everything were sold at the end of the year). This is a reality check called mark-to-market accounting.

Note should be made that the returns year to year often are decidedly negative. This volatility is found in the stock returns and in the long-term debt returns whether corporate or government. The reason for these annual losses in the debt instruments is that higher inflation rates reduce the purchasing power of long-term fixed income debt instruments causing the bond market to react with lower prices for the outstanding debt issues. This would be true even if the CTP Bank purchased insurance-based contracts such as GICs which are long-term debt instruments.

Hence, though stocks perhaps perform over the long haul they do not do so year by year and it is not likely the CTP manager would be able to withstand the criticism that would be heaped on him in the years in which equities declined in value. The more likely and seemingly defensible investment are the long-term high grade corporate and government issues. These, however, have shown to be subject to negative long-term real returns as well as high volatility. To make matters worse the volatility in the returns of long-term debt are systematically negative just at a time when the CTP Bank's liabilities accelerate. That is, if the CTP Bank were to have an approximate 3.5% tuition inflation rate applied to its liabilities but were invested in the seemingly reasonable category of long-term government bonds, an acceleration of inflation would substantially increase the liabilities of the CTP Bank in that year but its assets would decline remarkably in the market.

The CTP Bank's net worth then would be the difference between the appreciation or depreciation of its assets less the growth of its liabilities.
The tendencies for the CTP Bank's worth to vary inversely with inflation is shown in Table 2 and Figures 1 and 2 under the supposition that the CTP held a portfolio of only long-term government debt. In Figure 1 year by year from 1966 through 1986 the growth of the CTP's assets (if they were all held in long-term government bonds) is shown as a shaded bar whereas the growth of its liabilities based on a real tuition inflation rate of 3.5% is shown by the plain bar. The net effect of the growth of assets less liabilities is condensed in Figure 2 which shows the change that would have occurred in the CTP's worth per deposit dollar had it been in operation from 1966 to 1986 and if it invested in seemingly prudent long-term government bonds. What Figure 2 indicates is that in 14 of the 21 years examined the CTP's net worth would have declined.

Thus, the CTP Bank with its unique structure of inflation sensitive liabilities and contra-inflation sensitive assets (if invested in long-term debt) would cause the bank's worth to be subject to extreme windfalls -- both positive and negative as shown in Figure 2. Of course, when the cumulative negative changes exceed the cumulative positive changes, the CTP Bank is insolvent.

V. Developing Real Return Financial Instruments to Hedge the CTP's Risk

Because the CTP Bank portfolio must produce at least along with the inflation rate as its liabilities surely do, the inflation risk more likely would be covered if the bank were to obtain a hedge -- long-term financial returns that promise to exceed the inflation rate. This is the problem facing the CTP. Such instruments have been developed and offered in limited amounts. Having spent years in the development of these instruments and their practical implementation some comments are in order regarding both the difficulties as well as the possibilities of this undertaking.
Figure 1

Growth Rate of Assets and Liabilities:
1966-1986

- [Asset: Long term gov't bonds]
- [Liabilities: CPI-U + 3.5%]
Figure 2

Change in Net Worth Per Deposit Dollar:
1966-1986

* Based on CTP holding a portfolio of long-term government debt.
The CTP portfolio manager must locate high credit quality issuers of long term debt that would obligate themselves to issue inflation corrected returns. Inflation corrected financial instruments are often called real rate or return instruments. There are outstanding some real rate or inflation indexed product but in limited amounts though I know of no current attempts to originate or market such instruments. Those outstanding are CDs indexed to inflation earning between 3 to 4% above the inflation rate, some real return bonds, and some real return mortgages.

The logical entities inclined to issue real rate or inflation adjusting financial instruments that could be purchased by the CTP Bank would be producers whose revenues are highly sensitive to the price level so that inflation tends to automatically increase the firm's revenues, and/or entities whose assets appreciate in a rather systematic way with inflation.

Those firms that first come to mind are producing relatively scarce natural resources. In fact, the prototype of all natural resources that has been thought of as the most reliable long-term inflation-beating store of value is gold. However, being as "good as gold" has not been very good at all over the past 15 years with recent gold prices as seen in Figure 3 at about half of the levels reached in the late 1970s. Gold as a principal asset behind the CTP Bank's liabilities would have clearly resulted in a bankrupt CTP Bank.

The lesson of gold should not be seen in isolation. Magee and Robins (1978) in an analysis of historical inelastically supplied natural resources that experienced booms in prices picked out natural rubber after the wide adoption of rubber tires on automobiles between 1900 and 1910, industrial diamonds during the 1930s, and tin at the turn of the century as extreme examples of raw material scarcity that were most likely to result in very long-term appreciation in value.
What is common to each of these examples is the price boom for these items that surely exceeded overall inflation even for decades set up a mechanism for the private market to ultimately respond with substitutes when the price of the "irreplaceable" became too dear. When substitute natural resources would not do, modern chemistry was called to the challenge and produced synthetics for the rubber tire, the industrial diamond, and a process that vastly reduced inputs of tin.

If scarce natural resources can't be counted on to produce revenues that will exceed inflation, what about finished products such as the manufacture of automobiles? While it is possible for the price of a product and its revenues to track inflation or exceed inflation for a period of time appearing to make inflation indexed liabilities possible, the individual firm is still subject to competition so that a manufacturer with a declining market share would come to regret the day that it had financed its long-term debt with inflation sensitive obligations after inflation accelerated. Furthermore, the CTP's portfolio manager would similarly regret purchasing these bonds as the manufacturer's credit rating and the bond prices would slip well before the bonds were defaulted.

Another possibility for reliable issuance of long-term inflation adjusting debt is utilities. Utilities employ large quantities of physical capital requiring long-term debt financing. Utilities might feel comfortable that over the next decades they would be able to maintain their share of consumer and industrial spending because here is an industry in which competition is more controlled. Accepting the inflation risk seems to be reasonable except for the unknown of future utility rates set by politically sensitive boards and commissions. Where utilities can count on the commissions granting an inflation adjustment to their revenues, utilities become a prime candidate for the issuance of inflation adjusting financial instruments. In fact, a $300 million real rate private offering by a major utility was brought to market as a private offering.
Another set of possible issuers, in fact issuers with great potential to service inflation sensitive obligations, is the real estate industry. This is true for both the financing of residential and commercial real estate. In either case, a particular variant of inflation adjusting financing is necessary to make the inflation adjustment or the acceptance of the inflation risk palatable to the real estate borrower. The variant of the inflation adjusting financing that is manageable for the borrower, so as not to incur the shock of a sudden rise in inflation and the necessity to service a suddenly higher debt is the Price Level Adjusted Mortgage (PLAM). The PLAM allows the borrower to accept the inflation risk by first providing a lower initial payment but then adjusts the payments so that the payment stream over time tracks with the level of prices in the overall economy.

If there is an inflation surge of, say, 15% most of the additional inflation interest due is tacked on the balance of the mortgage and the mortgagor amortizes the additional balance over the life of the mortgage which results in the smooth payment level that tracks with the price level. The mortgage is retired over its term and the borrower in return for a small initial debt service agrees in accepting the inflation risk to adjust the level of his regular payment to the level of prices in the economy. That is, with the 15% inflation rate the payment level (not the rate) increases by 15% in the next time period.

How might we expect that the residential borrower can accept this inflation risk? If one's wages are escalated by overall inflation the share of income expended on the mortgage remains constant. In aggregate it is certainly true that it is not possible to have an inflation without wages escalating in a like amount or else there would be slack demand. Furthermore, the collateral for the loan, the residential structure should also be inflation adjusting so as not to lower the quality of the credit. One last comment on the tractability of residential PLAMs as an institutional investment suitable to hedge the CTP's inflation problem -- size is important and servicing of the mortgages can and
will be provided through the securitization of PLAM mortgages transforming the individual PLAMS into mortgage backed inflation adjusting bonds. This has been contemplated and has been close to implementation.

The PLAM works exceedingly well with some commercial real estate as well. When the revenues from the real estate have the capability to be inflation adjusted then the service of the PLAM mortgage is feasible. This is most likely to occur for example with shopping center or regional malls in which it is typical for the mall's rents to be a percentage of gross sales. In a regional mall with a large variety of products, generalized inflation tends to be reflected in the many items sold and hence in the rents making it feasible and in fact desirable for the owner to use this method of finance.

VI. Practical Barriers to Implementation: A Digression

Though it is logical for the MET and other state tuition plans to acquire long-term, high quality inflation adjusting financial instruments and though it might be in the financial interests of certain debt issuing entities such as commercial real estate operators, or utilities to finance a part of their operations with real rate financial instruments, the issuance of real return instruments is hardly a foregone conclusion. Indeed, there were articles written in the early 1980s trying to explain why inflation adjusting finance was a good idea that somehow had to be dismissed due to some mysterious market barriers (Weiner [1983]). But when inflation adjusting finance finally reached the market it was proclaimed to be "a milestone in the history of this country's financial markets" (Bodie [1990]).

Having played a role in bringing to the market many of these first real rate issues, my thoughts are that it is certainly possible to initiate real rate financing. Its implementation is but merely difficult -- though certainly not insurmountable as claimed. The difficulties are on several levels. First, there
is the identification of an issuer of long-term debt that has the basic economics to be able to indeed service long-term inflation adjusted liabilities. They exist.

Second, the issuer must put forth a good deal of extra effort for the first real rate or inflation adjusting debt deal and there needs to be an assurance that the cost of the funds at least on the initial deals are low in order to cover both the added cost of study as well as the additional organizational risk for a new and innovative financing.

Thirdly, the resistance to innovation within an organization can be formidable. This is true up and down the organization and many players have the opportunity to attempt to scuttle any new idea or new way of doing things no matter how compelling or worthwhile the undertaking. This can be true for not only the finance staff but also the legal, the accounting, the computer systems and other domains of the firm that need to be slightly adjusted as a result of this new type of financing. In addition, there is often the interference from the firm's investment banking relationships who if left out of the fees from the financing will act to scuttle the effort.

All these obstacles can be overcome if the uncertainty of the cost of the financing and the uncertainty associated with the ability to place the financing is resolved. That is, the firm will not care to undertake these implementation hurdles if there is a question of whether the real rate bonds can actually be sold in the market. Firms have reputational capital in the market and if the issue fails it hurts the firm in the future as its reputation has slipped, whereas a successful financing of a new issue is a feather in its reputational cap leading to possibly lower financing costs in the future. One must realize that the firm can always continue doing what it has been doing and it is less compelling for the firm to accept the inflation risk than for the CTP wishing to unburden itself of that risk.
VII. Summary and Conclusions

The MET plan and CTP plans like it have accepted considerable inflation risk and prudence calls for hedging that risk by acquiring portfolios of real return or inflation adjusting assets. Diversified portfolios of equities might accomplish this on average -- but the prepaid tuition plan requires performance, year-by-year.

The financial returns to systematically cover the inflation risk are not provided by conventional debt instruments whether high quality corporate or government debt issues whose total returns vary inversely with inflation in the market. In real return terms, high quality fixed income debt with maturities matched to the CTP's obligations carry annual real losses in years when the inflation rate is accelerating. This is not an uncommon event. Between 1966 and 1987 in 14 of the 21 years real total returns for long-term government debt were negative.

Portfolios of either type of long-term fixed debt do not protect the CTP Bank from the risk it has undertaken thus leaving the prepaid college tuition program in a financially unviable long-term position. A surge of inflation down the road both escalates the CTP's liabilities and renders its long-term fixed debt assets considerably less valuable in the market. Even if one is tempted to say, let's ignore market pricing (which is easy to do with insurance products which are not traded in the market) when the contracts expire there will not be sufficient funds to honor the inflation adjusted obligation.

The logical answer to the predicament is to obtain a diversified portfolio of long-term inflation adjusting debt instruments to hedge the inflation risk. In this way the MET's assets and liabilities are indexed to the same index. Of course, the inflation adjusting returns, or real returns, still might not be sufficient to cover extraordinary rates of tuition inflation if they exceed the
overall inflation rate for extended periods of time. While a continuation of the 4% real increases in tuition experienced in the 1980s does not seem sustainable given the ability of academic labor markets to adjust over a period of time, however the vulnerability is always present. Long-term real return instruments that were available in the market in the 1980s at between 3 and 4% real returns would likely cover the CTP Bank's exposure both year to year as well as over the long term especially when the "put" discounts are considered.

While not being aware of any efforts to originate real return instruments, 1992 would be an exceptionally good time to induce issuers to obligate themselves to inflation adjusted finance because inflation is currently not seen as an overwhelming or visceral threat. Corporate finance staffs in particular could likely be induced to accept the inflation risk at the current time. This is precisely the financial environment for the CTP to begin to induce potential issuers to accept the long-term inflation burden. It was exceedingly more difficult in the early 1980s when both high and variable inflation were present.

What the CTP is all about is inflation risk shifting. The parents wish to unburden themselves and shift the inflation risk to the CTP. By purchasing real return instruments, the CTP unburdens the program and the taxpayers by shifting the inflation risk to those entities that are equipped to handle it. The practical implementation is difficult but possible but only if the CTPs are committed to such a program.
REFERENCES


