

**PRELIMINARY ANALYSIS OF THE RENDELL TAX REFORM PROPOSAL:
IMPACT ON THE PHILADELPHIA TAX BASE, TAX REVENUE, AND THE PRIVATE ECONOMY**

Prepared For:

THE PHILADELPHIA TAX REFORM COMMISSION

Prepared By:

**ECONSULT CORPORATION
6th Floor
3600 Market Street
Philadelphia, PA 19104**

June 5, 2003

Version # 2

INTRODUCTION

The following analysis describes the impact on Philadelphia of Governor Rendell's proposal to raise Pennsylvania's personal income tax and use part of the proceeds to fund reductions in local taxes. The analysis is based on econometric models developed by Econsult prior to its engagement by the Philadelphia Tax Reform Commission. As part of Econsult's work for the Commission, these models will be updated using new data, and their structure will be rigorously reexamined as part of the tasks performed. The findings presented here, therefore, should be viewed as preliminary and subject to revision.

This analysis examines only the tax reform aspects of Governor Rendell's proposal. It does not examine the consequences of other aspects of Governor Rendell's proposed reform which provides more revenue for the Philadelphia public schools, but reduces funding for other programs in the city. Finally, our analysis relies on a number of assumptions which are explicitly enumerated. The qualitative impacts of changes in these assumptions are evaluated in the discussion of the findings.

THE RENDELL PROPOSAL

The state tax reform proposed by the Rendell Administration increases the state personal income tax by 0.95 percentage points. This tax increase is used for four purposes: 1) lowering local property taxes everywhere but Philadelphia—where the wage tax is reduced; 2) increasing state aid to local school districts; 3) filling the deficit in the current budget; and 4) creating a fund for economic development. This analysis focuses on the reduction of local taxes. The proposed tax reform will provide \$170 million for wage tax reduction in the City of Philadelphia. For fiscal year 2004, we estimate that this sum would allow the reduction of the blended wage tax rate from 4.28857 to 3.71809, a reduction of 0.57048 percentage points.¹

METHODOLOGY

The analysis of the effects of new state revenue dedicated to the reduction of the Philadelphia wage tax rate is based on alternative simulations using econometric models developed by Econsult for the Pennsylvania Economy League. This type of simulation analysis is commonly used to compare alternative economic policies and in general to provide a rational analytical framework to evaluate the economic ramifications of a given policy action. The Econsult model provides a consistent framework which can capture the aggregate impacts of the changes in Philadelphia's wage tax rates resulting from Governor Rendell's proposal.

¹ The blended wage tax rate is equal to .64 times the resident wage tax rate plus .36 times the nonresident wage tax rate.

The model simulation approach employed involves the following steps:

- Development of a model of the economic process;
- Preparation of a baseline simulation that assumes the current tax structure will remain as it currently is;
- Translation of Governor Rendell's proposal into an equivalent wage tax reduction;
- Introduction of the alternative wage tax assumption into the system;
- Calculation of the alternative scenario;
- Comparison of the behavior of the Philadelphia economy under the baseline to the economy incorporating the Rendell tax proposal; and
- Evaluation of results.

It must be realized, given the stochastic nature of the economic process that there will always be a degree of uncertainty about the performance of the model. Further, it must be emphasized that this problem cannot be eliminated via increased model complexity nor does model complexity necessarily improve accuracy. Decades of experience suggest that simple, parsimonious models tend to be best for out-of-sample forecasting problems.²

THE ECONSULT MODEL

The econometric model used in this analyses employs estimated relationships between Philadelphia's tax rates and tax bases. The basic structure of the city tax base equations is as follows:

$$\Delta^k b_{w,t} = \alpha_0 + \sum_0^M \alpha_m \Delta^k \tau_{w,t-m} + \sum_0^M \alpha_{M+m} \Delta^k \tau_{p,t-m} + \sum_0^M \alpha_{2M+m} \Delta^k \tau_{g,t-m} + \mu_t^w$$

where: $b_{j,t}$ is the base, expressed as a share of the national base of tax j at time t

² In other words, including more variables in a forecasting model won't necessarily improve its forecasting performance outside the historical period.

$$j = (w, g, p)$$

$\tau_{j,t-m}$ is the tax rate of tax j at time t-m

M is the number of lagged tax rates

Δ^k is the difference operator and k is the order of the difference

α, β, δ are the parameters of the effect of tax rates on tax base share

$\mu_t^w, \mu_t^g, \mu_t^p$ are error terms for the wage, gross receipts and property base share equations.

There is a common structure across estimation models: each tax base is normalized as a share of the national base; each equation is estimated in differences; and current and lagged values of own and other tax rates are included in each equation. For example, in the wage tax base model the own tax rate is the wage tax rate and the other tax rates are the gross receipts tax rate and property tax rate. The actual estimations differ in degree of differencing, lengths of lags, and inclusion of tax rates other than own rates. Note that these models do not include measures of other factors that might affect the economic performance of the city. To the extent that these factors, which include school quality, public safety etc., are correlated with *changes* in tax rates, these models may lead to estimates of the relationship between tax rates and tax bases that are biased. We believe, however, that many of these factors, while undeniably important for the economic health of the city, tend to follow long-term, smooth trends, and hence are unlikely to be highly correlated with changes in tax rates. As part of our overall project for the Philadelphia Tax Reform Commission, we will conduct a more in-depth examination of the extent to which taking into account these other factors changes our estimated relationships between tax bases and tax rates.

Using the local share of the nation's tax base is appropriate because Philadelphia is effectively competing nationally, and its share of the nation is a good indicator of its relative growth and success. From an empirical point of view, this means that we are effectively controlling for national trends in growth and inflation. For example, we would not want to ascribe increases in the Philadelphia wage tax base resulting from inflation or general national growth to changes in tax rates. The second key aspect of the models is that the relationships are estimated in either first differences or second differences ($k=1$ or 2) as is appropriate to assure that there are no unit roots in the data.³ Finally, we have allowed the effect of tax changes to appear over time, and therefore included lagged tax changes in our econometric models.

The estimation results indicate that reductions in tax rates expand the base of the particular tax being reduced and that changes in wage and gross receipts tax rates have cross-base

³ A unit root process refers to a highly persistent time series process where the current value equals last period's value plus a weakly dependent disturbance. If a variable has a unit root shocks to it will have permanent effects. For a detailed discussion of the estimation results see Richard P. Voith, *Philadelphia City Tax Structure and the Metropolitan Economy*, Econsult Corporation Report, 2002.

effects. This means that losses in tax revenues resulting from a reduction in tax rates will be partially offset by the growth in the base resulting from tax reductions. This has significant, although not surprising, implications for the Rendell proposal. That is, a wage tax rate reduction equivalent to the \$170 million state transfer will have the effect of increasing the base and in turn increasing tax revenues.

The actual size of the difference is calculated through the use of a simulation model. The simulation model is developed by combining the estimated equations for the tax base shares with a series of identities used to provide projections of the tax bases and revenues given alternative assumptions relating to the growth of the national economy and local tax rates (the “exogenous” variables). For example, the Philadelphia wage tax base is estimated by multiplying the equation results (given assumptions relating to national economic growth and future tax rates) by an estimate of the corresponding national base. Tax revenues are then computed by multiplying the estimated base times the wage tax rate assumption employed. Equations are estimated for the wage tax base, the gross receipts tax base and the property tax base.

ASSUMPTIONS

In conducting this analysis there are a number of assumptions and considerations to keep in mind. First, we assume that the increase in state personal income tax rate has no aggregate effect on the city of Philadelphia. This assumption may appear odd in light of the fact that our statistical models indicate that local wage taxes (which are akin to income taxes) do have negative impacts; however, we believe that the bulk of the negative impacts of the wage tax are due to its level relative to its suburban neighbors. City residents and firms can avoid the wage tax at relatively low costs by moving within the metropolitan area. Avoiding the state personal income tax would entail much higher costs, and therefore the negative impact of the increase in the state income tax should be relatively small.

Second, the increased differential in property taxes between city and suburban economies will have no negative effect on the city economy. This is not really an assumption, but rather a finding of our preliminary statistical analysis—that is, property tax rates do not affect the size of the wage tax base or wage tax revenues. We will be analyzing this issue further in the course of our overall tax structure analysis. It is possible that further refinements of the statistical analysis will modify this finding. Also, lower property taxes in the suburbs resulting from tax reform could adversely affect Philadelphia property values (which do not receive property tax reductions as a result of the Rendell proposal). We have not explicitly factored in this possibility. However, we do not expect this omission to be a significant issue for the following reason—the reduction of property taxes in the suburban counties will also increase their property values. The cost reduction of a suburban location will be less than the full amount of the tax reduction because the tax reduction will be capitalized in the price of the property. This means that the property tax reduction will

provide the suburbs with only a modest cost differential implying that the adverse competitive impacts for the city will be correspondingly smaller.

Third, we have not addressed the implications of the Rendell Administration's budget priorities. To the extent that there are reductions in state aid to the city, the ability to support its current services will be adversely affected. It should be noted, however, that the tax reform proposal increases state financial resources beyond those required for the local tax reform and increases in school aid, so that reductions in state aid may be more severe in absence of reform.

Fourth, we do not factor in the impacts of the increased school aid to the School District of Philadelphia, which are large. These infusions to the school district will have positive direct impacts on the city's economy and education system, and may obviate the need for increases in taxes to support school spending. These considerations are not explicitly taken into account.

Fifth, we assume that the state revenue for wage tax relief is constant at \$170 million for the foreseeable future.

Sixth, we assume that the national economy will grow at the rate projected by the U.S. Congressional Budget Office in *The Budget and Economic Outlook: Fiscal Years 2004 – 2013*, January 29, 2003. These suggest that the U.S. economy will grow at the average annual rate of 5.4 percent in nominal terms between 1994 and 2008 and at 5.0 percent per annum between 2009 and 2013.

Seventh, the wage tax base is assumed to be equal to the BEA data on wages and salaries for the City of Philadelphia. The gross receipts tax base is determined by dividing the revenues from the Mercantile License and Gross Receipts portion of the Business Privilege Taxes by the tax rates. The property tax base is the assessed value of taxable properties in Philadelphia divided by the ratio of assessment to market value.

Lastly, we assume, with the exception of the wage tax reduction in the Rendell alternative, that the Philadelphia tax rates will remain unchanged over the forecast period. These assumptions are shown in Table 1. The analysis did not include the "Nutter" and "Mariano" tax reductions in order to simplify the measurement of the effect of the tax reform aspects of Governor Rendell's proposal. In other words, the additional tax decrease has to be removed from the difference between the baseline and the alternative scenario. This was accomplished by assuming that tax rates remained constant in the baseline.

BASELINE SCENARIO

The baseline forecast which is summarized in Table 2 shows that the wage tax base is expected to grow over the 2004 to 2010 period at an annual average rate of 0.67 or less than 1

percent. The wage tax base is approximately \$30 billion in 2002 and is expected to grow to about \$31.3 billion. This means that tax revenues will increase over the period but by considerably less than the rate of inflation assuming that the tax rate remains constant.⁴ Further, the models indicate that Philadelphia's share of the nation for its wage tax base will continue its downward trend.

The Philadelphia property tax base is anticipated to remain relatively stable over the forecast horizon increasing at the rate of .07 percent per year on average. This means that the Philadelphia property tax base is expected to grow more slowly than the nation. Further, the growth in property tax revenues will not keep pace with inflation.

The gross receipts tax base is expected to grow more rapidly over the forecast period than either the wage tax base or property tax base. Nevertheless, it is still anticipated to grow at a somewhat slower pace than that expected for the economy as a whole. The rate of increase expected over the 2004 to 2010 period is approximately 3.1 percent. This means that gross receipts tax revenues will increase from \$109 million in 2002 to \$131.3 million in 2010.

RENDELL SCENARIO

The Rendell Scenario was developed by reducing the blended wage tax rate in 2004 to 3.71809 percent, a decrease of 0.57048 percentage points. This reduction is equal to the approximately \$170 million of revenues that will be distributed to the City of Philadelphia from the state tax increase. This amounts to about 17 percent of the wage tax base. The wage tax decrease is anticipated to have significant positive wage tax base effects as well as cross-base effects with respect to property taxes. This suggests, assuming that state tax rates will have little impact on the city, that the City of Philadelphia will be better off under the Rendell proposal.

Table 3 shows the effect of the tax decrease on the wage and property tax bases as well as the effects on wage and property tax revenue. Note that our preliminary models do not imply any impact on the gross receipts tax base or revenue. This may be explained by the fact that there is no direct link between taxable wages and taxable receipts, since the new jobs resulting from wage tax cuts may be in firms that serve a national market, with very few sales in Philadelphia that are taxable under the gross receipts tax. The wage tax base is anticipated to grow from \$30.6 billion to \$34.1 billion between 2004 and 2010 as a result of the supply side effects of the wage tax cut (Column 2). This implies that the Philadelphia economy will be generating roughly 11 percent more in wages and salaries than it would be without the wage tax reduction. The additional growth means that wage tax revenues (including the \$170 million from the state) will exceed the baseline revenues. Wage tax revenues (again including the \$170 million of state revenues) would grow to

⁴ The Congressional Budget Office projections expect that the rate of inflation will be about 2.2 percent in 2004 and 2.5 percent per annum through 2010.

\$1.44 billion by 2010, which is about 10 percent higher than the baseline (Column 4). The cumulative gain in revenue above the baseline is, at first glance, large—nearly \$849 million. Note that this increase is only about 3.4 percent of the cumulative City budget over the period. In sum, not only would the size of the Philadelphia economy increase, but the City's general revenue fund would grow, which could accommodate additional tax reduction or additional public services.

The wage tax reduction would also result in higher property values. The property tax base will grow from \$30.2 billion to \$33.1 billion, about 9.5 percent. Note that Philadelphia property values significantly lag behind those of many similar metropolitan areas. Even with this increase, Philadelphia's median residential property values would remain considerably lower than the surrounding counties. For example, the median property value in Philadelphia in 2000 was \$59,700 whereas in Bucks County it was \$163,200, Chester \$182,500, Delaware \$128,800, Burlington \$170,800, Camden County \$111,200, Gloucester County \$120,100, and Montgomery County \$160,700. Similarly Philadelphia residential property values were less than other cities: in Boston it was \$190,600, Baltimore \$69,100, Chicago \$132,400, Washington DC \$157,200, Newark \$119,000, Hartford \$93,900, New Haven \$109,200, San Francisco \$396,400, and Oakland \$235,500. If assessments were to keep pace with rising property values in the city, additional property tax revenue would accrue to the city. Property tax revenue would increase by 9.5 percent. In the seventh year, property tax revenues would exceed the baseline by \$69.1 million and the cumulative gain would be \$360 million.

The bottom line is that the Rendell tax reform proposal is likely to increase the size of the Philadelphia economy and increase the city's property values. This growth will increase City revenues so that wage taxes plus the state aid to the city will significantly exceed baseline revenue forecasts. Further, increases in property values would allow the city to generate additional funds for both the City and School District without increasing tax rates.

Table 1. Exogenous Assumptions

Year	Wage Tax Rate⁵	Property Tax Rate⁶	STEB Ratio⁷	Gross Receipts Tax Rate	National Growth Rate
2003	4.28857	8.26400	0.30300	0.00230	3.60000
2004	3.71809	8.26400	0.30300	0.00230	4.20000
2005	3.71809	8.26400	0.30300	0.00230	5.40000
2006	3.71809	8.26400	0.30300	0.00230	5.50000
2007	3.71809	8.26400	0.30300	0.00230	5.40000
2008	3.71809	8.26400	0.30300	0.00230	5.40000
2009	3.71809	8.26400	0.30300	0.00230	5.30000
2010	3.71809	8.26400	0.30300	0.00230	5.30000

⁵ The Wage Tax Rate is a blended rate computed as the weighted average of the resident and nonresident rates using the fraction revenue from each group as the weight.

⁶ The Property Tax Rate is an effective rate estimated as the STEB Ratio times the Philadelphia Property Tax Rate.

⁷ The Pennsylvania State Tax Equalization Board maintains this annual series expressing the fraction of market value that is reflected in the assessment of each county.

Table 2. Baseline Tax Base and Tax Revenue Projections

WAGE TAXES				
	Tax Base	Share of the U.S. tax base	Change in the tax base	Revenue
2002	\$ 30,026,333,616	0.60%	\$ 551,259,205	\$ 1,298,720,000
2003	\$ 29,844,823,315	0.58%	\$ (181,510,302)	\$ 1,279,916,736
2004	\$ 29,797,973,833	0.56%	\$ (46,849,482)	\$ 1,277,907,562
2005	\$ 29,881,132,562	0.54%	\$ 83,158,729	\$ 1,281,473,884
2006	\$ 30,263,266,314	0.52%	\$ 382,133,753	\$ 1,297,861,965
2007	\$ 30,628,568,949	0.50%	\$ 365,302,634	\$ 1,313,528,232
2008	\$ 30,913,179,100	0.47%	\$ 284,610,152	\$ 1,325,733,943
2009	\$ 31,139,214,241	0.45%	\$ 226,035,141	\$ 1,335,427,623
2010	\$ 31,269,822,410	0.43%	\$ 130,608,168	\$ 1,341,028,848

PROPERTY TAXES				
	Tax Base	Share of the U.S. tax base	Change in the tax base	Revenue
2002	\$ 30,498,425,286	0.17%	\$ (267,379,570)	\$ 763,678,129
2003	\$ 30,187,313,717	0.16%	\$ (311,111,569)	\$ 755,887,920
2004	\$ 30,003,854,367	0.15%	\$ (183,459,350)	\$ 751,294,113
2005	\$ 29,940,465,096	0.16%	\$ (63,389,271)	\$ 749,706,851
2006	\$ 30,162,227,295	0.15%	\$ 221,762,198	\$ 755,259,758
2007	\$ 30,349,400,619	0.15%	\$ 187,173,324	\$ 759,946,564
2008	\$ 30,437,044,620	0.14%	\$ 87,644,001	\$ 762,141,162
2009	\$ 30,445,655,320	0.13%	\$ 8,610,701	\$ 762,356,774
2010	\$ 30,337,630,889	0.13%	\$ (108,024,431)	\$ 759,651,850

GROSS RECEIPTS TAXES				
	Tax Base	Share of the U.S. tax base	Change in the tax base	Revenue
2002	\$ 45,404,437,736	0.43%	\$ 496,729,487	\$ 108,970,651
2003	\$ 46,157,877,671	0.43%	\$ 753,439,935	\$ 106,163,119
2004	\$ 47,178,381,677	0.42%	\$ 1,020,504,006	\$ 108,510,278
2005	\$ 48,758,308,581	0.41%	\$ 1,579,926,904	\$ 112,144,110
2006	\$ 50,419,086,032	0.40%	\$ 1,660,777,452	\$ 115,963,898
2007	\$ 52,065,656,963	0.39%	\$ 1,646,570,931	\$ 119,751,011
2008	\$ 53,743,035,500	0.38%	\$ 1,677,378,537	\$ 123,608,982
2009	\$ 55,397,138,595	0.38%	\$ 1,654,103,095	\$ 127,413,419
2010	\$ 57,075,612,431	0.37%	\$ 1,678,473,836	\$ 131,273,909

Table 3. Rendell Proposal Tax Base and Tax Revenue Projections

WAGE TAXES					
	Tax Base	Share of the U.S. tax base	Supply side change in the tax base	Revenue	Revenue (plus PA contribution)
2003	\$ 29,844,823,315	0.58%	\$ -	\$ 1,279,916,736	\$ 1,279,916,736
2004	\$ 30,574,706,879	0.57%	\$ 776,733,046	\$ 1,136,794,552	\$ 1,306,787,182
2005	\$ 31,163,406,118	0.56%	\$ 1,282,273,556	\$ 1,158,682,908	\$ 1,328,675,538
2006	\$ 31,614,782,643	0.54%	\$ 1,351,516,329	\$ 1,175,465,485	\$ 1,345,458,115
2007	\$ 33,070,866,005	0.53%	\$ 2,442,297,056	\$ 1,229,603,948	\$ 1,399,596,578
2008	\$ 33,487,360,198	0.51%	\$ 2,574,181,097	\$ 1,245,089,569	\$ 1,415,082,199
2009	\$ 33,852,401,118	0.49%	\$ 2,713,186,877	\$ 1,258,662,113	\$ 1,428,654,743
2010	\$ 34,126,808,191	0.47%	\$ 2,856,985,781	\$ 1,268,864,809	\$ 1,438,857,439

PROPERTY TAXES				
	Tax Base	Share of the U.S. tax base	Supply side change in the tax base	Revenue
2003	\$ 30,187,313,717	0.16%	\$ -	\$ 755,887,920
2004	\$ 30,003,854,367	0.15%	\$ -	\$ 751,294,113
2005	\$ 32,030,169,781	0.16%	\$ 2,089,704,685	\$ 802,032,889
2006	\$ 32,364,776,032	0.15%	\$ 2,202,548,738	\$ 810,411,403
2007	\$ 32,673,089,537	0.15%	\$ 2,323,688,918	\$ 818,131,548
2008	\$ 32,886,212,739	0.14%	\$ 2,449,168,120	\$ 823,468,136
2009	\$ 33,027,078,519	0.13%	\$ 2,581,423,198	\$ 826,995,404
2010	\$ 33,055,869,517	0.13%	\$ 2,718,238,628	\$ 827,716,328

GROSS RECEIPTS TAXES				
	Tax Base	Share of the U.S. tax base	Supply side change in the tax base	Revenue
2003	\$ 46,157,877,671	0.43%	\$ -	\$ 106,163,119
2004	\$ 47,178,381,677	0.42%	\$ -	\$ 108,510,278
2005	\$ 48,758,308,581	0.41%	\$ -	\$ 112,144,110
2006	\$ 50,419,086,032	0.40%	\$ -	\$ 115,963,898
2007	\$ 52,065,656,963	0.39%	\$ -	\$ 119,751,011
2008	\$ 53,743,035,500	0.38%	\$ -	\$ 123,608,982
2009	\$ 55,397,138,595	0.38%	\$ -	\$ 127,413,419
2010	\$ 57,075,612,431	0.37%	\$ -	\$ 131,273,909