REVENUE ESTIMATING METHODOLOGY

CONTENTS

AN OVERVIEW OF THE FORECAST PROCESS

The Division of the Budget (DOB) provides a detailed forecast for all tax and miscellaneous receipts sources in the Executive Budget. (See the Financial Plan.) The purpose of this report is to provide background information on the methods and models used to generate the receipt estimates for the major receipt sources contained in the Budget. DOB's forecast methodology utilizes sophisticated econometric models augmented by the input of a panel of economic experts and a thorough review of economic and revenue data to form multi-year quarterly projections of economic and revenue changes.

THE ECONOMY

The economic environment is the most important factor influencing the receipts estimates. The receipts structure of New York State is dominated by tax sources, such as the personal income and sales taxes, that are sensitive to economic conditions. As a result, the first and most important step in the construction of receipts projections requires an analysis of economic trends at both the State and national levels. The schedule below sketches the frequency and timing of forecasts performed over the course of the year.

ECONOMIC AND REVENUE FORECAST SCHEDULE

A brief overview of how the Budget Division forecasting process unfolds over the course of the calendar year is presented below. From one perspective, the following schedule begins at the end, since the submission of the Executive Budget in January represents the culmination of research and analysis done throughout the preceding year. For the remainder of the year, the Economic and Revenue Unit closely monitors all of the relevant economic and revenue data and regularly updates an extensive array of annual, quarterly, monthly, weekly, and daily databases. For example, estimates of U.S. Gross Domestic Product data are released at the end of each month for the preceding quarter. U.S. employment and unemployment rate data is released on the first Friday of each month for the preceding month, while unemployment benefits claims data is released on a weekly basis. Receipts data published by the Office of the State Comptroller is released by the 15th of each month for the preceding month, while similar data from the New York State Department of Taxation and Finance is monitored on both a monthly and daily basis. The Executive Budget forecast is updated four times during the year in compliance with State Finance Law.

JANUARY	Submission of Executive Budget by the Governor to Legislature by the middle of the month, or by February 1 following a gubernatorial election.
FEBRUARY	Prepare forecast for Executive Budget With 30-Day Amendments.
MARCH	Joint Legislative-Executive Economic and Revenue Consensus Forecasting Conference.
APRIL	Statutory deadline for submission for enactment of State Budget by the Legislature.
JUNE/JULY	Prepare forecast for First Quarter Financial Plan Update (July Update).
SEPTEMBER/ OCTOBER	Prepare forecast for Mid-Year Financial Plan Update: > Meet with DOB Economic Advisory Board for review and comment on mid-year forecast. > Incorporate comments of Board members.
DECEMBER	Prepare Executive Budget forecast and supporting documentation.

OVERVIEW

The process begins with a forecast of the U.S. economy. The heart of the DOB U.S. forecast is the DOB macroeconomic model. The DOB model structure employs recent advances in econometric modeling techniques to project the most likely path of the U.S. economy over the multi-year forecast horizon included in the Executive Budget. The model framework and its development is described in detail in this volume. Model output is combined with our qualitative assessment of economic conditions to complete a preliminary U.S. forecast. In addition, Division of the Budget staff review the projections of other forecasters of the U.S. economy to provide a yardstick against which to judge the DOB forecast.

The U.S. forecast serves as the key input to the New York macroeconomic forecast model. National conditions with respect to employment, income, financial markets, foreign trade, consumer confidence, and stock market prices, can have a major impact on New York's economic performance. However, the New York economy is subject to idiosyncratic fluctuations, which may lead the State economy to perform much differently than the nation as a whole. The evolution of the New York economy is governed in part by a heavy concentration of jobs and income in the financial and business service industries. As a result, economic events that disproportionately affect these industries can have a greater impact on the New York economy than on the rest of the nation. The New York economic model is structured to capture both the obvious linkages to the national economy and the factors which may cause New York to deviate from the nation. The model estimates the future path of major elements of the New York economy, including employment, wages and other components of personal income and makes explicit use of the linkages between employment and income earned in the financial services sector and the rest of the State economy.

To adequately forecast personal income tax receipts — the largest single component of the receipts base, projections are also required of the income components that make up State taxable income. For this purpose, DOB has constructed models for each of the components of New York State adjusted gross income. The results from this series of models serve as input to the income tax simulation model described below, which is the primary tool for calculating New York personal income tax liability.

A final part of the economic forecast process involves using tax collection data to assess the current state of the New York economy. Tax data is often the most current information available for judging economic conditions. For example, personal income tax withholding provides information on wage and employment growth, while sales tax collections serve as an indicator of consumer purchasing activity. Clearly, there are dangers in relying too heavily on tax information to forecast the economy, but this data is vital in assessing the plausibility of the existing economic forecast, especially in the short run.

ECONOMIC ADVISORY BOARD

At this point, a key component of the forecast process takes place: the Budget Director and staff confer with a panel of economists with expertise in macroeconomic forecasting, finance, the regional economy, and public sector economics, to obtain valuable input on current and projected economic conditions, as well as an assessment of the reasonableness of the DOB estimates. The U.S. and New York forecast is reviewed by the DOB economic panel to assess the reasonableness of the projections. In addition, the panel provides input on other key functions that may impact on receipts growth, including financial services compensation and the performance of sectors of the economy difficult to capture in any model.

RECEIPTS FORECAST

Once the economic forecast is complete, the projections are used as inputs into the forecasts of selected revenues. Again, we combine qualitative assessments, our econometric analysis and expert opinions on the New York revenue structure to produce a final receipts forecast.

The DOB receipts estimates for the major tax sources rely on a sophisticated set of econometric models that link economic conditions to revenue generating capacity. The models use the economic forecasts described above as inputs and are calibrated to capture the impact of policy changes. As part of the revenue estimation process, DOB staff analyze industry trends, tax collection experience and other information necessary to better understand and predict receipts activity.

For large tax sources, such as the personal income tax, receipt estimates are approached by constructing underlying taxpayer liability and then projecting liability into future periods based on the economic forecast generated from econometric models specifically developed for each tax. After liability is estimated for future taxable periods, it is converted to cash estimates on a fiscal year basis.

The Division of the Budget employs micro-simulation models to estimate future tax liabilities for the personal income and corporate taxes. This technique starts with detailed taxpayer information taken directly from tax returns (the data is stripped of identifying taxpayer information) and allows for the actual computation of tax under alternative policy and economic scenarios. The DOB simulations allow for a bottom-up estimate of tax liability for future years as the data file of taxpayers is "grown," given DOB estimates of economic growth. An advantage of this approach is it allows direct calculation of tax law changes and the revenue impact of already enacted and proposed tax changes on future liability. As with most of our revenue models, the simulation models require projections of the economic variables which drive tax liability. The simulation of future tax liability is most important for the income tax, which accounts for over half of General Fund tax receipts. The income tax simulation is discussed in greater detail later in this report.

The following flow chart provides an overview of the receipts forecasting process. The entire forecast process from the gathering of information to the running of various economic and receipt models is designed to inform and improve the DOB receipt estimates. As with any large scale forecasting process, the qualitative judgment of experts plays an important role in the estimation process. It is the job of the DOB economic and revenue analysts to investigate the sources of model errors and to assess the impact of changes in the revenue environment that models cannot be expected to capture. The goal of the staff is to produce the most informed judgments about the future course of the economy and our receipts base.

THE ASSESSMENT OF FORECAST RISK

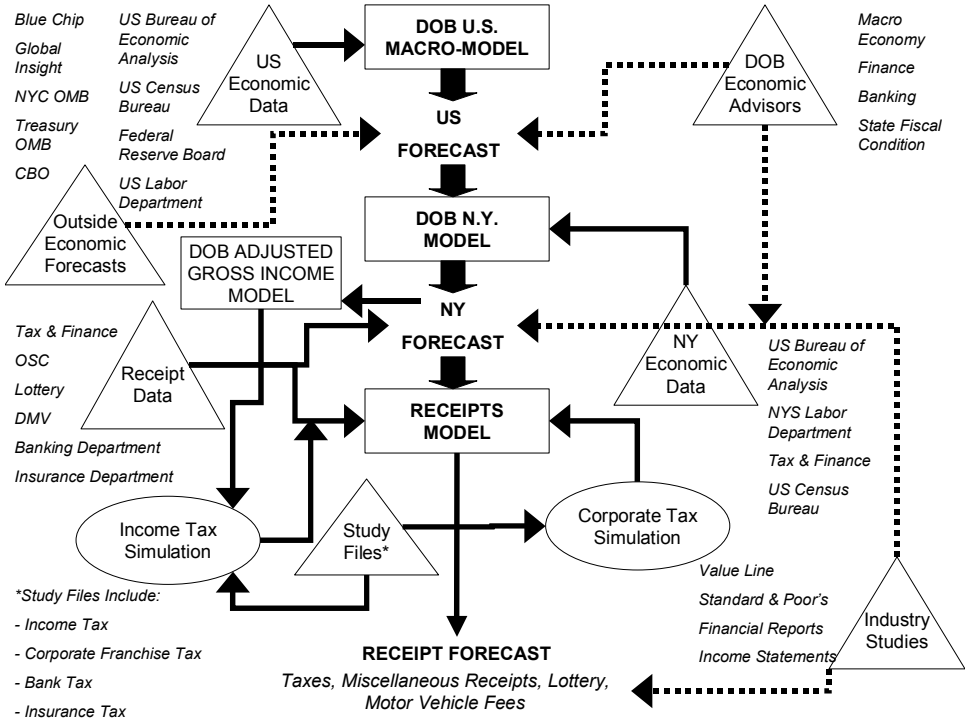
The models the Division of the Budget employs are simplified versions of complex economic relationships. As a result, there is a significant level of uncertainty associated with economic and receipt estimates derived from these models. This is to be expected. The factors influencing economic and revenue growth are varied and can change in unpredictable ways over time. As already mentioned, no model or process for developing revenue projections can fully capture this complexity. Outcomes remain uncertain. As a result, significant caution is warranted in developing and evaluating receipt estimates.

OVERVIEW

Often economic forecasters use sophisticated techniques, such as Monte Carlo analysis, to quantify the risk associated with a forecast by providing confidence bands (ranges) around their "best" or "point" estimates.[1] The range provides the analyst with the likelihood the world will turn out differently than the point estimate produced by a model. For example, the range around a forecast might tell us there is a chance the point forecast will fall within a certain interval around that estimate with 95 percent confidence (probability). Often a 95 percent confidence band (or even a much less exacting band) can be quite wide, suggesting the possibility that the actual result could deviate substantially from the point estimate. Further, an analysis of confidence ranges requires the estimated model be a correct representation of reality from a statistical standpoint. If the model is incorrectly specified, it is impossible to calculate exact probability ranges, thereby leaving the forecaster in the dark as to the adequacy of the point estimate.

The middle of the forecast range is often considered the best point estimate. However, a reliance on mid-range estimates assumes the costs associated with an over or under estimate are identical. Clearly, in many cases, the cost associated with a forecast error is asymmetric. In the revenue-estimating context, the cost of overestimating receipts for a fiscal year may outweigh the cost of underestimating receipts, given that ongoing spending decisions may be based on revenue resources projected to be available.

The Economic and Revenue Forecasting Process



[1] For an example of such an analysis, see Holland, et al. (2001).

U.S. MACROECONOMIC MODEL

The Economic and Revenue Unit within the Division of the Budget (DOB) provides projections on a wide range of economic and demographic variables. These estimates are used in the development of State revenue projections, expenditure trending, debt capacity analysis, and for other budget planning purposes. The Division has developed econometric models for the U.S. and State economies that yield the forecasts needed for these purposes.

RECENT DEVELOPMENTS IN MACROECONOMIC MODELING

Macroeconomic modeling has undergone a number of important changes during the last 25 years, primarily as a result of developments in economic and econometric theory. However, fundamental changes in the structure of the economy since the 1970s have also led to a significant altering of the way the economy is modeled. Four related lines of economic research have had a significant impact on the current state of macroeconomic modeling.

The first major development was Robert Lucas' (1976) critique of the role of expectations in traditional macroeconomic models. If economic models did not incorporate the assumption that agents were forward looking, then it would be unlikely that model forecasts would be consistent with a rational response on the part of agents to a policy change, should there be one. The result was a widespread adoption of rational expectations in macroeconomic forecasting models. The Lucas analysis also initiated the emergence of a new generation of econometric models explicitly based on micro-foundations. Firms and households are assumed to make decisions based on optimization plans that are realized in the long run.

Second, Christopher Sims (1980) raised serious doubts that standard large-scale econometric models were effective in properly identifying the behavioral relations among agents in the economy. This critique led to a more flexible identification of the behavioral relations among economic agents within a vector autoregression (VAR) model framework. Unlike structural models, VAR models do not impose an *a priori* structure on the dynamic relationships among economic variables.

A third development was initiated by the classic study of Nelson and Plosser (1982), which concluded that the hypothesis of nonstationarity cannot be rejected for a wide range of commonly used macroeconomic data series. Heuristically, nonstationarity implies the lack of a constant mean and variance in a time series. Research surrounding the absence of stationarity has led to a re-evaluation of what constitutes a long-run equilibrium relationship, and prompted a revisiting of the problem of spurious regression described by Granger and Newbold (1974). This led to a more rigorous analysis of the time series properties of economic data and the implications of these properties for model specification and statistical inference.

Further, nonstationarity also led to a fourth development, engendered by the work of Engle and Granger (1987), Johansen (1991), and Phillips (1991) on the presence of long-run equilibrium relationships among macroeconomic data series, also known as cointegration. Although cointegrated series can deviate from their long-term trends for substantial periods, there is always a tendency to return to their common equilibrium paths. This behavior led to the development of a framework for dealing with nonstationary data in an econometric setting known as the error-correction model. The error-correction framework has permitted extensive research on how to best exploit the predictive power of cointegrating relationships.

Another area that has spawned a substantial wealth of academic research is the choice of an optimal monetary policy. The dramatic changes in the institutional structure of financial markets over the past 25 years have rendered the aggregate money supply a much less tractable target than interest rates. In addition, new developments in economic theory, including game theory and the rational expectations hypothesis, appear to favor a rule-based monetary policy, as opposed to a purely discretionary approach. A rule-based approach is

believed to maximize the credibility of the central bank, a key input to the effectiveness of the policy itself. However, the desirability of this feature must be weighed against the reliability of the information available when policy decisions are made. Perhaps the most popular example of an interest rate-setting rule is the one proposed by John Taylor (1993) and commonly known as Taylor's rule. Although the debate as to which rule yields the optimal monetary policy is ongoing, recent research by Orphanides (2003) using real-time data indicates that Federal Reserve policy has been consistent with a "Taylor-rule framework" almost since its inception.

BASIC FEATURES

The Division of the Budget's U.S. macroeconomic model (DOB/U.S.) incorporates the theoretical advances described above in an econometric model used for forecasting and policy simulation. The agents represented by the model's behavioral equations optimize their behavior subject to economically meaningful constraints. The model addresses the Lucas critique by specifying an information set that is common to all economic agents, who incorporate this information when forming their expectations. The model's long-run equilibrium is the solution to a dynamic optimization problem carried out by households and firms. The model structure incorporates an error-correction framework that ensures movement back to equilibrium in the long run.

Like the Federal Reserve Board model, the assumptions that govern the long-run behavior of DOB/U.S. are grounded in neoclassical micro-foundations. Consumers exhibit maximizing behavior over consumption and labor-supply decisions and firms maximize profit. The model solution converges to a balanced growth path in the long run. Consumption is determined by expected wealth; expected wealth is, in part, determined by expected future output and interest rates. The value of investment is affected by the cost of capital and expectations about the future path of output and inflation.

However, in addition to the microeconomic foundations which govern long-run behavior, DOB/U.S. incorporates dynamic adjustment mechanisms which reflect the fact that while agents are forward-looking, they do not adjust to changes in economic conditions instantaneously. Sources of "friction" within the economy include adjustment costs, the wage-setting process, and persistent spending habits among consumers. The presence of such frictions delays the adjustment of nonfinancial variables, producing periods of over- or under-utilization of labor and capital. The presence of such imbalances constitutes signals that are important in the setting of wages and prices because price setters must anticipate the actions of other agents. For example, firms set wages and prices in response to a set of expectations concerning productivity growth, available labor, and the consumption choices of households.

In contrast to the "real" sector, the financial sector is assumed to be unaffected by frictions due to the negligible cost of transactions and the presence of well-developed primary and secondary markets for financial assets. This contrast between the real and financial sectors permits monetary policy to have a short-run impact on output. Monetary policy is administered through interest-rate manipulation via a federal funds rate policy target. Current and anticipated changes in this rate influence agents' expectations and the rate of return on various financial assets.

OVERVIEW OF MODEL STRUCTURE

DOB/U.S. comprises five modules of estimating equations, forecasting well over 200 variables. The first module estimates the formation of agent expectations, which become inputs to three of DOB/U.S.'s other modules. Agent expectations play a key role in determining long-term equilibrium values of important economic variables, such as

consumption and investment, which are estimated in the second module. A third module forecasts variables that become exogenous inputs to the core behavioral model, which makes up the fourth block of estimating equations. The core behavioral model is the largest and most complex part of DOB/U.S. and much of the discussion that follows focuses on this component. A fifth module is comprised of satellite models that use core model variables as inputs. The results from this module do not feed back into the core module.

The current estimation period for the model is the first quarter of 1965 through the third quarter of 2003, although some data series do not have historical values for the full period. Descriptions of each of the five modules follow below.

EXPECTATIONS FORMATION

Few important macroeconomic relationships are free from the influence of expectations. When examining behavioral relationships in a full macroeconomic model, the general characteristics and policy implications of that model will depend upon precisely how expectations are formed.

Rational and Adaptive Expectations

Expectations play an important role in DOB/U.S. in the determination of consumer and firm behavior. For example, when deciding expenditure levels, consumers will take a long-term view of their income prospects. Thus, when deciding how much to spend in a given quarter or year, they will not merely consider their income in that period, but rather their lifetime or "permanent income," based on the life cycle/permanent income hypothesis put forward by Friedman (1957), among others. Consumers use all information available to them at the time they make purchases, including estimates of permanent income. Similarly, firms are forward-looking and base their decisions on future expectations of prices, interest rates and output. However, both consumers and firms are assumed to exhibit a degree of behavioral inertia, making adjustments only gradually.

DOB/U.S. assumes that all economic agents form their expectations "rationally," meaning all available information is used, and expectations are correct, on average, over the long-term. More formally, the expectation of a variable Y at time t, Y_t, formed at period $t-1$, is the statistical expectation of Y_t based on all available information at time $t-1$. However, because of the empirical finding that agents adjust their expectations only gradually, expectations in DOB/U.S. are assumed to have an "adaptive" component as well. We therefore include the term, $\alpha\ Y_{t-1}$, where α is hypothesized to be between zero and one. Consistent with rational expectations theory, it is assumed that agents' long-run average forecast error is zero. This "hybrid" specification is inspired by Roberts (2001), Rudd and Whelan (2003), Sims (2003), and others who find that the notions of adaptive and rational expectations should not be viewed as mutually exclusive, particularly in light of the high information costs associated with forecasting. Moreover, given the empirical importance of lags in forecasting inflation, as well as other economic variables, it cannot be said that "price-stickiness" is model-inconsistent.

While rational expectations theory is now well established, its use continues to challenge model builders. DOB/U.S. incorporates expectations at two stages. First, measures of expectations pertaining to three key economic variables are estimated within a vector autoregressive framework (see Table 1). These expectations become part of an information set that is shared by all agents who then use them to form expectations pertaining to agent-specific variables. Details of this process are presented in the next three sections.

Shared Expectations

All agents in DOB/U.S. use a common information set to form expectations. This set consists of three macroeconomic variables: the federal funds rate, inflation, and the percentage output gap. The percentage output gap is defined as actual real Gross Domestic Product (GDP) minus potential real GDP, divided by actual real GDP. The variables are estimated within a VAR framework in first-difference form.

Table 1
Historical VAR Model

$$\Delta r_t = \alpha_0(\pi-\pi_\infty)_{t-1} + \alpha_1 x_{t-1} + \alpha_2(r-r_\infty)_{t-1} + \sum_{i=1}^{4}\alpha_{3i}\Delta\pi_{t-i} + \sum_{i=1}^{4}\alpha_{4i}\Delta r_{t-i} + \sum_{i=1}^{4}\alpha_{5i}\Delta x_{t-i}$$

$$\Delta\pi_t = \beta_0(\pi-\pi_\infty)_{t-1} + \beta_1 x_{t-1} + \beta_2(r-r_\infty)_{t-1} + \sum_{i=1}^{4}\beta_{3i}\Delta\pi_{t-i} + \sum_{i=1}^{4}\beta_{4i}\Delta r_{t-i} + \sum_{i=1}^{4}\beta_{5i}\Delta x_{t-i}$$

$$\Delta x_t = \gamma_0(\pi-\pi_\infty)_{t-1} + \gamma_1 x_{t-1} + \gamma_2(r-r_\infty)_{t-1} + \sum_{i=1}^{4}\gamma_{3i}\Delta\pi_{t-i} + \sum_{i=1}^{4}\gamma_{4i}\Delta r_{t-i} + \sum_{i=1}^{4}\gamma_{5i}\Delta x_{t-i}$$

r	Federal funds rate
π	Percent change in GDP deflator
x	Percentage output gap

Note: The subscript, ∞, is used to indicate the end-point condition. For the percentage output gap, the end-point condition stipulates a long run value of zero.

The long-run values of the three variables are constrained by "endpoint" conditions. The endpoint condition for the federal funds rate is computed from forward rates. For inflation, the terminal constraint is the ten-year inflation rate expectation as measured by survey data developed by the Federal Reserve Bank of Philadelphia. The percentage output gap is assumed to be zero in the long run, reaching its endpoint condition in about five years.

An important feature of the endpoint restrictions for the federal funds rate and inflation is that they are not fixed. Should the public alter its expectations in response to economic developments, such as a shift in monetary policy, these changes are captured and then fed into the rest of the model.

Potential Output and the Output Gap

Potential Gross Domestic Product is the level of output that the economy can produce when all available resources are being utilized at their most efficient levels. The economy can produce both above and below this level, but when it does so for an extended period, economic agents can expect inflation to either rise or fall, although the precise timing of that movement can depend on many other factors. The output gap is the difference between actual and potential output.

Following the method used by the Congressional Budget Office (CBO), the Division of the Budget divides the economy into five sectors: nonfarm business, farm, government, nonfarm housing, and households and nonprofit institutions.[1] The nonfarm business sector is by far the largest sector of the economy, constituting 84.1 percent of total GDP during 2000. A neoclassical growth model is used to model this sector, incorporating three inputs to the production process: labor (measured by the number of hours worked), the capital stock, and total factor productivity.

The inputs to the production process are adjusted to their "potential" levels by removing from the data series the historical movements that can be associated with the business cycle. To measure the total potential capital stock, the U.S. Bureau of Economic Analysis (BEA) measure of the real capital stock is multiplied by the capacity-utilization rate, after removing the cyclical component of the latter series using a method developed by the CBO.[2] To measure the potential level of the number of hours worked, the cyclical component is also removed using the CBO method.

To estimate the potential level of total factor productivity, the actual values of labor and capital are substituted into a fixed-coefficient Cobb-Douglas production function, where a coefficient of 0.7 is applied to labor and 0.3 is applied to capital.[3] Total factor productivity is the residual left when the output value estimated by the production function is subtracted from the historical value of output. Removing the business cycle component from this residual yields its potential level. Substituting the potential levels of all of the inputs back into the production function, where total factor productivity is given a coefficient of one, yields a measure of potential nonfarm business GDP. For the other sectors of the economy, the cyclical component is removed directly from the series itself in accordance with a variant of the regression method used by CBO to estimate potential hours worked.

Agent-Specific Expectations

The common information set is augmented by a richer information set for certain agents in certain sectors. For instance, consumers base their consumption decisions on their expected lifetime accumulation of wealth and, therefore, the information set for consumers includes equations for lifetime values of stock market and non-stock market wealth as shares of personal income, in addition to the three-variable common information set.

LONG-TERM EQUILIBRIUM DETERMINATION

The economy's long-term equilibrium describes a set of conditions that result from the optimizing behavior of economic agents, after all adjustments have taken place. For example, in the firm sector, the desired price level is determined by the condition that price equals marginal cost. Similarly, producers will choose a desired level of nominal wage growth by summing trend productivity growth and the long-term expected rate of inflation.

[1] See Congressional Budget Office (1995, 2001).

[2] The CBO removes the cyclical component of hours worked by regressing the logarithm of actual hours worked on a group of time-trend dummy variables which allow the relationship between the dependent variable and time to change with each major economic expansion. The fitted values from this regression represent the logarithm of potential hours worked.

[3] The use of a fixed-coefficient production function follows the growth accounting literature in assuming that aggregate production exhibits constant returns to scale and firms are profit maximizers. Under these conditions, the parameters of the production function can be approximated by the empirical shares of labor compensation and capital income in the value of total output. The CBO adopts this approach rather than an econometric approach to estimation of the production function parameters.

In the household sector, optimizing behavior is based on a life-cycle model in which consumers maximize their expected lifetime utility. Risk-averse consumers tend to smooth their pattern of consumption over time, by borrowing, saving, or dissaving. In the short run, consumption adjusts gradually to this optimal consumption path via a dynamic adjustment process, as described in the next section.

An allowance is made for low-income households, who may base their consumption decisions on current-period income rather than permanent income. Such behavior may arise because of credit constraints which prevent certain households from borrowing in order to even out their spending growth over time. Such households are often referred to as "liquidity constrained."

EXOGENOUS VARIABLES

There are many economic variables for which economic theory provides little or no guidance as to either their long-term or short-term behavior. The exogenous variable module estimates future values for over 50 such variables, whose only inputs are variables from the shared information set and autoregressive terms. Although a few exogenous variables become inputs to the behavioral equations within the core behavioral module, most are incorporated into identity equations defined to arrive at U.S. Department of Commerce National Income and Product Account (NIPA) concepts.

THE CORE BEHAVIORAL MODULE

The core behavioral module contains 99 estimating equations, of which 29 are behavioral. The behavioral equations summarize the behavior of representative agents acting with foresight to achieve optimal outcomes in the presence of constraints. In the economy's real sector, the movement toward equilibrium is hampered, in the short run, by adjustment costs. Through the dynamic adjustment process, agents plan to close the gap between the current level of the variable in question and the desired level. The magnitude of an adjustment made by agents during any given period is based on the size of the gap, as well as on past values of the variable and past and expected values of other variables that may affect agents' decisions.

In the financial sector, agents are assumed to adjust instantaneously when new information becomes available. Therefore, the equations for this sector do not contain any dynamic adjustment terms. The core behavioral module is composed of five sectors: households, firms, government, the financial sector, and the foreign sector. Each is described below.

The Household Sector

The main decision variables for households are consumption, housing investment, labor supply and the demand for liquid assets (money). Following the Federal Reserve Board's methodology, DOB/U.S. assumes the existence of two classes of consumers. Some consumers, facing borrowing constraints, make decisions about consumption based on current-period incomes only. Others are life-cycle consumers whose consumption decisions are based on their permanent incomes.

The five equations for the household sector incorporate expectations from either the shared information set VAR model or the agent-specific information set. The agent-specific information set for the household sector contains the expected value of wage and nonwage income, as well as the expected value of household wealth.

DOB/U.S. assumes that some households are forward-looking in that they take into account their expected lifetime income when choosing current-period consumption. These consumers are assumed to maximize the present value of lifetime utility derived from consumption, constrained by their expected lifetime accumulation of wealth. However, also implicit in the model is the recognition that households are heterogeneous, representing various stages of the life-cycle. Therefore, DOB/U.S. estimates optimal, or desired, consumption as a function of expected wealth, disaggregated into its income and asset components, each with its own marginal propensity to consume.

The behavioral equations for the household sector balance the theoretically appealing notion of a long-term equilibrium with the empirically observed phenomenon of habit persistence. The equations for the determination of cyclical consumption, noncyclical consumption, and housing investment appear in Table 2. Brief descriptions of the equations follow:

Consumption

Consumption is divided into cyclical (durable goods) and noncyclical components (services and nondurables), since these two components tend to exhibit significantly different growth rates over the course of a business cycle. Noncyclical consumption is estimated using first differences of the logs of the data, within a polynomial adjustment cost framework. The equation contains an "error-correction" term that captures the tendency toward equilibrium, a lagged dependent variable that captures the partial adjustment effects of habit persistence, forward expectations of both desired noncyclical consumption and the output gap, and real income. The last term captures the behavior of liquidity-constrained households. The specification for cyclical consumption is very similar to the noncyclical consumption specification, except for the exclusion of the latter two expectations terms and the inclusion of potential GDP and an interest rate, which captures the fact that many consumer durables, such as automobiles and large appliances, are purchased on credit.

Housing Investment

Housing investment is estimated using a dynamic adjustment equation. It is assumed that households adjust their rate of housing investment in accordance with a long-term equilibrium relation between desired noncyclical consumption and housing services. Thus, the equation contains desired consumption divided by current housing investment, a lagged endogenous variable to capture habit persistence, forward-looking expectations of desired consumption, the mortgage rate and the price deflator for residential investment.

Labor Supply

Households must make decisions about how much labor they supply to the labor market. Households provide more labor when expected wages go up. However, households tend to supply less labor when expected per capita household net worth rises, holding other factors constant. In DOB/U.S., the behavioral equation which determines the labor force participation rate includes expected wages, expected per capital household net worth, as well as lags of the participation rate itself. The labor supply is then determined by multiplying the labor force participation rate by an estimate of the working-age population (ages 16 through 64).

Table 2
Household Sector

$$\Delta \ln C1_t = \alpha_0 + \sum_{\tau=0}^{5} EZQC_{t+\tau} + \alpha_1 (\ln QC - \ln C1)_{t-1} + \alpha_2 \Delta \ln C1_{t-1} + \alpha_3 (\Delta \ln Y_t - \sum_{\tau=0}^{5} EZQC_{t+\tau}) + \alpha_4 \sum_{\tau=0}^{5} EZGAP_{t+\tau}$$

$$\Delta \ln C2_t = -\beta_0 + \sum_{\tau=0}^{5} EZQC_{t+\tau} + (\ln QC - \ln C2)_{t-1} - \beta_2 \Delta \ln C2_{t-1} + \beta_3 \Delta \ln POTGDP_t - \beta_4 TRATE5_{t-1}$$

$$\Delta INVH_t = -\gamma_0 + \sum_{\tau=0}^{5} EZQC_{t+\tau} + \gamma_1 (QC / INVH)_{t-1} + \gamma_2 INVH_{t-1} - \gamma_3 \Delta PIH_t - \gamma_4 \Delta RM_t$$

C1	Noncyclical consumption
C2	Cyclical consumption
QC	Desired noncyclical consumption
Y	Real personal income
EZQC	Expected future desired noncyclical consumption
EZGAP	Expected future potential GDP gap.
POTGDP	Potential Real GDP
TRATE5	Interest rate on 5-year Treasury notes
INVH	Residential fixed investment
PIH	Price deflator for residential investment
RM	Mortgage rate

The Firm Sector

DOB/U.S. incorporates the assumption that firms set their prices and levels of factor inputs used in production to maximize profits. This sector determines the levels of nonresidential fixed investment, private nonresidential structures, hours worked and labor demand, real wages, and output prices. Like the behavioral equations describing the household sector, several of the firm sector equations also incorporate error-correction terms to capture the tendency toward long-term equilibrium, as well as dynamic adjustment terms to capture firm-level adjustment costs. The behavioral equations for investment in computer-related producer durable equipment, all other producer durable equipment, and nonresidential structures appear in Table 3.

Nonresidential Investment

DOB/U.S. estimates three categories of nonresidential investment: investment in computer-related producer durable equipment, investment in all other equipment, and investment in nonresidential structures.

Nonresidential investment in producer durable equipment has grown every year between 1992 and 2000 at an average annual rate of 12 percent. Most econometric models have failed to capture this persistent and significant growth. Tevlin and Whelan (2000) postulate two reasons why most models have failed to capture this boom in investment. First, the depreciation rate has increased dramatically as computers become obsolete in just a few

years. Secondly, investment has become more sensitive to the cost of capital. In order to address these problems, DOB/U.S. estimates investment in computer equipment separately from the remainder of producer durable equipment.[4]

Equilibrium Investment in Producer Durable Equipment

Desired investment is the level that maintains the optimum capital-output ratio. With a Cobb-Douglas production function, the optimal capital-output ratio will be equal to the ratio of the price of output to the rental rate of capital. Given this optimal ratio, desired investment varies with output growth and the rental rate of capital.

The rental rate of capital is the purchase price of capital multiplied by the sum of the financial cost of capital and the rate of depreciation. Different rates of depreciation are used for computer and noncomputer equipment and for structures. The financial cost of capital (FCC) is a weighted average of the cost of borrowing in equity and debt markets, $FCC = 0.8\,BAA + 0.2\,EQUITYCOST$, where BAA is the yield on Moody's Baa corporate bonds and EQUITYCOST is the after-tax cost of equity.[5]

Table 3
Firm Sector

$$\Delta ICO_t = -\alpha_0 + \sum_{\tau=0}^{5} EZQI_{t+\tau} + \alpha_1 (QI - ICO)_{t-1} + \alpha_2 \Delta ICO_{t-1} + \alpha_3 \Delta POTGDP_{t-2} - \alpha_4 \Delta RRC_{t-1} - \alpha_5 Y2KD_t$$

$$\Delta IEXCO_t = \beta_0 + \sum_{\tau=0}^{5} EZQI_{t+\tau} + \beta_1 (QI - IEXCO)_{t-2} + \beta_2 \Delta IEXCO_{t-2} + \beta_3 \Delta POTGDP_{t-2} + \beta_4 \Delta DOD_{t-2}$$

$$\Delta \ln IS_t = -\gamma_0 - \gamma_1 (\ln IS - \ln GDP)_{t-1} + \gamma_2 \Delta \ln IS_{t-1} + \gamma_3 \Delta \ln GDP_{t-1} + \gamma_4 \Delta \ln DS_{t-1}$$

ICO	Nonres. fixed investment – Computer and related equipment
QI	Desired Nonres. fixed investment – Durable equipment
EZQI	Expected future desired investment
RCC	Rental rate of capital – Computers
DOD	Depreciation rate – Other durable equipment
DS	Depreciation rate – Structures
IEXCO	Nonres. fixed investment – Durable equipment excl. Computers
IS	Nonres. fixed investment – Structures
POTGDP	Potential Real GDP
GDP	Real GDP
Y2KD	Post-Y2K dummy for 2001

Computers and Related Producer Durable Equipment

The equation for investment in computer equipment contains an error-correction term, defined as the difference between desired investment in producer durable equipment and current computer investment, a lagged endogenous variable, forward expectations of desired nonresidential investment, the current and lagged value of potential output growth, and the

[4] The brisk growth of computer equipment as a share of total producer durable equipment may represent in part an error in the data. Chain-weighting tends to overestimate real quantities when prices fall as quickly as those of computers and related equipment.
[5] This series is created by Global Insight.

rental rate of office, computing, and accounting machinery as defined above. The depreciation rate used in the formulation of the rental cost of computers is 31 percent, which is more than twice the rate used for noncomputer equipment.[6]

Producer Durable Equipment Excluding Computers

The specification for investment in producer durable equipment excluding computers is almost identical to the computer investment specification, except for the incorporation of the appropriate depreciation rate for noncomputer producer durable equipment.

Private Nonresidential Structures

Investment in nonresidential structures is assumed to be proportional to output in the long run and is also determined by the cost of capital. The specification includes these terms, as well as a lagged endogenous variable and real U.S. GDP growth.

Labor Demand: Hours Worked and Employment

Nonfarm private sector labor demand determines the actual level of employment and the number of hours worked in the national economy and, therefore, affects the movements of many economic variables, such as output, wages, consumption, and inflation.

The desired level of man-hours worked is constructed by dividing potential real GDP by trend labor productivity. Man-hours are estimated using a dynamic adjustment equation with an error-correction term composed of desired man-hours versus actual man-hours. The expected future output gap is also included.

Firm employment for the nonfarm private sector is modeled in a similar fashion. The desired level of employment is constructed using the assumption that the relationship between actual hours and actual employment is the same as the relationship between the desired level of hours and the desired level of employment. The equation contains desired employment versus actual employment, the expected future output gap, and real GDP.

In both equations, employment growth is determined by trend productivity and, in the long run, potential GDP. Error-correction terms capture the long-run tendency toward equilibrium.

The Wage Rate

The wage rate is defined as total private wage compensation (wages plus other labor income and employer contribution for social security insurance) divided by total hours worked (average annual hours worked per employee times private employment). Inflation is measured by the private nonfarm chain-weighted GDP deflator. Productivity is private nonfarm output divided by total hours and is adjusted to represent trend productivity.

The long-run growth in average wages, or the wage rate, is assumed to depend on productivity increases and the inflation rate, but is also possesses a degree of wage-stickiness. Thus, the desired wage rate at time *t* is its value at time *t-1* plus the sum of the growth rates for productivity and inflation. The actual quarterly wage rate is modeled using a polynomial adjustment-cost framework in which the actual wage rate adjusts over time to the desired level. The output gap affects the speed of adjustment and can push the actual rate above or below the desired rate.

[6] See Fraumeni (1997).

Output Prices

The price level is modeled by using a dynamic adjustment framework in which the price level adjusts over time from its current level to the desired level. The output gap also influences the inflation rate and can push the actual rate above or below the long-run rate, as can shifts in the growth rate of energy prices. Energy prices are determined by oil prices. The price level is represented by the private nonfarm chain-weighted GDP deflator. Unit labor costs are defined as compensation per hour relative to trend productivity.

The Government Sector

Monetary policy affects economic and financial decisions made by agents in the economy. The objective of monetary policy is to stabilize the performance of the economy, as reflected in the behavior of inflation, output, and employment. This is accomplished by raising or lowering short-term interest rates through changes in the central bank's target federal funds rate in a manner that is consistent with Taylor's rule. Taylor's rule is a federal funds rate reaction function that responds to the deviation of inflation from its target level and to the deviation of output growth from its potential level. As such, Taylor's rule approximates the way the Federal Reserve has historically conducted monetary policy, particularly when the classic rule is augmented by expectations over future inflation and output. However, the rule also yields a "normative prescription" for the direction of future policy.[7]

Taylor's rule has several desirable features. First, it is formulated in terms of the federal funds rate, a measure of inflation, and the output gap. Thus, the rule posits a direct relationship between the Federal Reserve's primary policy instrument and the two indicators most important in judging the success of the central bank's stabilization policy. No reference to intermediate targets is necessary, greatly increasing the rule's appeal to policy makers. Second, the rule possesses the simplicity of a linear relationship. Finally, although Taylor's rule represents an empirical relationship, it has also been demonstrated to possess desirable theoretical properties as well. For example, Taylor's rule leads to a determinate rational-expectations equilibrium that is robust to the introduction of a plausible dynamic learning process.

Within DOB/U.S., monetary policy is administered through a modified version of Taylor's classic monetary rule. We assume the Federal Reserve Board (FRB) weighs deviations from its inflation target about twice as heavily as deviations from its output growth target, so the inflation deviation has a weight of 1 while output-growth deviation has a weight of 0.5. In addition, the contemporaneous value of inflation is replaced by an average of actual inflation for the past three quarters and expected inflation for both the current quarter and the quarter ahead. A similar modification is made to the output growth term. Hence, this modified specification operationalizes the requirement that the central bank be able to project the effect of its policy alternatives on the output gap and inflation and that its policy choice be consistent with that projection. The DOB/U.S. specification of Taylor's rule appears in Table 4.

[7] See Woodford (2002), p. 39.

Table 4
Monetary Policy – Taylor's Rule

$$r_T = \bar{\pi} + R + \alpha_1(\bar{\pi} - \pi_T) + \alpha_2(\bar{g} - g_T)$$

where,

$$\bar{\pi} = \frac{\pi_{t-3} + \pi_{t-2} + \pi_{t-1} + \pi_t + \pi_{t+1}}{5}$$

$$\bar{g} = \frac{g_{t-3} + g_{t-2} + g_{t-1} + g_t + g_{t+1}}{5}$$

$$R = r - \pi$$

r	Federal funds market rate	g	GDP growth rate
r_T	Federal funds target rate	$\bar{g}$	Average GDP growth rate
$\bar{\pi}$	Average GDP inflation	g_T	GDP target growth rate
π	GDP inflation	R	Real rate of interest
π_T	Inflation target		

DOB/U.S. also contains equations that estimate the contribution to GDP from the Federal, state and local governments. In addition, DOB/U.S. estimates the impact of changes in fiscal policy on the macroeconomy. Since the primary determinant of consumer spending is households' long-term expectation for disposable income, modeling fiscal policy impacts plays an important role in forecasting household consumption when there is a policy change as there was in 2001 and 2003. For this purpose, DOB/U.S. combines the most recent Joint Committee on Taxation and Congressional Budget Office estimates where available with results from the Current Expenditure Survey data, disaggregated by income level, to estimate how much of the change in disposable income will affect consumption.

The Financial Sector

The financial sector of DOB/U.S. is sub-divided into two blocks of equations: one determining equity prices and the other determining interest rates. Many analysts believe that short-run changes in stock market prices follow a random walk and therefore it is impossible to forecast the day-to-day movements of individual stocks with any accuracy. However, long-run movements in price indices of large groups of stocks appear to move systematically with other economic variables. Much of the variation in the growth of the Standard & Poor's 500 price index can be explained by the contemporaneous and expected growth of pre-tax corporate profits after normalizing by the interest rate on Baa corporate bonds. A lead term is added to capture the influence of profit expectations on investors' decisions to buy and sell equities, and, consequently, on stock prices.

Interest rates are modeled using seven stochastic equations for the federal funds rate, the rates on the three-month, one-year, five-year, and ten-year government securities, the Baa corporate bond rate, and the 30-year conventional mortgage rate. These equations are specified based on the expectations theory of the term structure of interest rates, which posits that the yield on long-term bond equals the expected yield on a series of short-term bonds over the life of the long-term bond, plus term and risk premiums. The theory implies that the rate on 1-year government bonds can be used to explain the rate on five-year bonds, which, in turn, is used to explain the rate on bonds of longer maturities. Although the term and risk premiums are not explicitly captured in the estimated model, their impacts are embodied in the estimated coefficients.

The Foreign Sector

Real U.S. exports are determined by the level of foreign economic activity, as measured by an estimate of global GDP and U.S. export prices relative to foreign prices.

Real imports are divided into nonoil and oil imports. Nonoil imports are a function of real domestic demand and the ratio of import prices to domestic prices. Oil imports are a function of real private nonfarm economic activity as well as oil prices relative to overall prices.

SATELLITE MODELS

Employment

A set of equations was developed for the components of employment. Total nonagricultural employment is disaggregated into 15 industrial sectors based on NAICS. Nine of the sectors are estimated together in a restricted vector autogression (RVAR) model and six sectors are estimated individually.

The RVAR model assumes that the levels of sectoral employment are interrelated in many cases. Only those sectors for which variations could be well explained by the movement of other sectors and the growth of real GDP are estimated within the RVAR model. The six remaining sectors are estimated using first differences and an error-correction formulation along with an exogenous variable, such as real GDP.

Other Prices

The nonfarm private GDP deflator and other deflators from the core model are used to forecast several implicit price deflators for consumption, as well as the overall Consumer Price Index (CPI) and some of its components.

The Producer Price Index (PPI) for refined petroleum products and other implicit price deflators for consumption are used to forecast several components of PPI.

Other Interest Rates and the Wilshire 5000

DOB/U.S. also estimates eight additional interest rates, including commercial paper rates, Treasury bond rates, state and local municipal bond rates, and mortgage rates. These rates are estimated in single-equation models using variables from the core model as inputs. The Wilshire 5000 stock price index is estimated using the S&P 500 stock price index as an explanatory variable.

Miscellaneous Variables

Many miscellaneous variables are forecast using variables from all the models discussed above, as well as the New York model. Forecasts of these miscellaneous variables are based on single-equation models.

NEW YORK STATE MACROECONOMIC MODEL

The Division of the Budget's macroeconomic model for New York State attempts to capture the fundamental linkages between the New York and national economies. As with all states, New York's economy depends on economic developments in the U.S. economy, usually expanding when the national economy is growing and contracting when the nation is in recession. However, this relationship is neither simple nor static. The growth rate of the State economy can vary substantially from that of the national economy. For example, during the early 1990s the State was in recession noticeably earlier than the nation and came out of recession significantly later. In contrast, during the early 1980's recession, the State economy fared better than the nation.

In the absence of an official mechanism for dating business cycles at the sub-national level, DOB staff constructed a New York State Index of Coincident Economic Indicators measuring overall economic conditions for New York.[1] The methodology used to construct the index is based on Stock and Watson (1991) and rests on the notion that co-movements in many macroeconomic time series can be captured by a single unobserved variable representing the overall state of the economy. Four State data series — private sector employment, hours worked in the manufacturing sector, the unemployment rate, and sales tax receipts (as a proxy for retail sales) — are combined into a single index using the Kalman filter, a common approach to the estimation of unobserved variables. Based on the DOB Coincident Index, five business cycles have been identified for New York since the early 1970s, as reported in the table below. A recession is judged to have begun if the DOB Coincident Index sustains three to five consecutive declines of significant depth. A similar approach is used to date business cycle troughs.

In order to gauge the future direction of the State economy, the Budget Division produces the New York State Index of Leading Economic Indicators, which yields a forecast for the Coincident Index up to 12 months ahead. The forecasting model includes the following five leading economic variables in a vector autoregressive framework: the U.S. Index of Leading Economic Indicators (excluding stock prices and the interest rate spread), New York housing permits, New York initial unemployment insurance claims, stock prices, and the spread between the ten-year and one-year U.S. Treasury rates.

NEW YORK STATE BUSINESS CYCLES

Peak Date	Trough Date	Recession Length (in months)	Private Sector Job Losses
October 1973	November 1975	25	384,800
February 1980	September 1980	7	54,800
August 1981	February 1983	18	76,600
June 1989	November 1992	41	551,700
December 2000	August 2003	32	333,000

Source: DOB staff estimates.

The DOB macroeconomic model for the State (DOB/N.Y.) quantifies the linkages between the national and State economies within an econometric framework that specifically identifies the unique aspects of economic conditions in New York. DOB/N.Y. is a structural time-series model, with most of the exogenous variables derived from DOB/U.S. In general, the long-run equilibrium relationships between State and national economic variables are captured using cointegration/error correction specifications, while the State's unique dynamics are modeled within a restricted VAR (RVAR) framework.[2]

[1] See Megna and Xu (2003).

[2] Because the number of parameters to be estimated within an unrestricted VAR framework is often very large, the model can be expected to be unstable. To address this concern, those parameters found to be insignificant at the 5 percent level are constrained to equal zero. The resulting RVAR model is both more parsimonious and more stable.

MODEL STRUCTURE

DOB/N.Y. has six major components: a nonfarm payroll employment module, a real nonbonus average wage module, a bonus payment module, a nonwage income module, a price module, and an unemployment rate module.

EMPLOYMENT

New York employment is disaggregated into 15 industrial sectors, parallel to DOB/U.S. DOB/N.Y. is an "open economy" model with most production factors and outputs free to move across the State's borders. The relationship between the national economy and New York employment is captured through two channels. First, for those sectors where rates of State and national employment growth are significantly related, the national growth rate is specified as an exogenous variable in the equation. Second, overall U.S. economic conditions, as measured by the growth of real U.S. GDP, are included directly in the employment equations for some sectors and are allowed to influence employment of other sectors through the VAR relationships.

For 13 industrial sectors, New York's unique employment growth pattern is captured within an RVAR setting where the impact of one sector upon another is explicitly modeled. The choice as to which sectors to include on the right-hand side of a sectoral equation in the RVAR model is based on the results of an initial unrestricted VAR estimation. In the final RVAR specification, only those sectors that are well explained by the movements of other sectors are included in the final VAR model. Table 5 is an example of the sector employment.

Table 5
Manufacturing Employment

$$\Delta \ln E39_t = -\alpha_0 + \alpha_1 \Delta \ln E39_{t-1} + \alpha_2 \Delta \ln E23_{t-2} - \alpha_3 \Delta \ln E46_{t-1} + \alpha_4 \Delta \ln EUS39_t - \alpha_5 DQ1_t + \alpha_6 DQ2_t + \alpha_7 DQ3_t$$

E39	Manufacturing employment
E23	Construction employment
E46	Retail trade employment
EUS39	National manufacturing employment
DQi	Seasonal dummy for quarter *i*

The two remaining industrial sectors are estimated individually. These equations are specified as autoregressive models, with a corresponding national employment term included in each equation as an exogenous variable.

BONUS AND STOCK INCENTIVE PAYMENTS

Total New York State wages are composed of two components: a base wage component which is relatively uniformly distributed over the course of the firm's fiscal year, and a more variable component comprised primarily of bonus payments and income derived from the exercise of employee stock options and other one-time payments.

There are several reasons why the variable component of wages is modeled separately. First, bonuses have grown substantially in the 1990s as a proportion of total wages. The two factors most responsible for this strong growth are the robust performance of securities industry profits during that period and the shift in the corporate wage structure away from fixed pay and toward performance-based bonuses. Second, bonus payments play a significant role in the forecast of State government finances, since they tend to be

concentrated among high-income taxpayers and, therefore, are taxed at the top income tax rate. Further, the timing of bonus payments affects the pattern of wage payments and consequently the State's cash flow. Tax collections from wages usually peak during December, January, and February, corresponding to the timing of bonus payments. Finally, because they are performance-based, bonus payments display a very different growth pattern from nonbonus average wages in that they tend to be much more volatile.

No government agency collects data on variable income as distinct from ordinary wages; therefore, it must be estimated. The Division of the Budget derives its estimate of bonuses from firm-level data as collected under the Unemployment Insurance program. Firms report their wages to the Unemployment Insurance program on a quarterly basis. The firm's average wage per employee is calculated for each quarter. The average over the two quarters with the lowest average wages is assumed to reflect the firm's base pay, that is, wages excluding variable pay. If the average wage for either of the remaining quarters is significantly above the base wage, then that quarter is assumed to contain variable income.[3] The average variable payment is then defined as total average wage minus the base average wage, after allowing for an inflation adjustment to base wages. Total variable pay is then calculated by multiplying the average bonus payment by the total number of firm employees. It is assumed that only private sector employees earn variable pay.

Bonus payments are modeled in two steps. First, a bonus payments model for the finance and insurance sector is estimated. The forecast results of the first step are then used to project bonus payments for other sectors. Finance and insurance sector wages, particularly from bonus payments, represent a significant share of total State wages and appear to have a leading influence on bonuses paid in other sectors. Second, the feedback effects of growth in this sector on other sectors of the economy, especially business services, can be substantial.

We have found that indicators of Wall Street underwriting activities, such as the dollar volume of initial public offerings (IPOs) and debt, can explain most of the variation in financial and insurance sector bonuses. Forecasts of these variables are provided by DOB/U.S. The finance and insurance sector bonus model is then constructed by using these underwriting activities as explanatory variables with an error-correction term. The finance and insurance sector bonus equation appears in Table 6.

Table 6
Bonuses for Finance and Insurance Sector

$$\ln B52_t = -\alpha_0 + \alpha_1 \ln IPO_{t-3} + \alpha_2 \Delta \ln DEBT_t + \alpha_3 t - \alpha_4 D98_t + \alpha_5 DQ1_t + \alpha_6 AR4_t$$

IPO	Initial public offering ($)
DEBT	Debt underwriting ($)
B52	Bonus for finance and insurance sector
t	Time trend
AR4	First-order autocorrelation correction at the 4th lag
DQ1	Seasonal dummy for quarter 1
D98	Dummy variable for Asian financial crisis (1998)

[3] The threshold adopted for this purpose was 25 percent. However, the variable income estimates are fairly robust to even a five percentage-point swing in this criterion.

Our analysis shows that finance and insurance sector bonuses are a good predictor of bonus-payment behavior in other sectors. More technically, bonus payments in the financial services sector are cointegrated with bonuses paid in most other sectors. Therefore, we use a cointegration/error correction framework in the second step to estimate bonuses for all of the other sectors. Table 7 gives an example of the specification for bonuses in manufacturing.

Table 7
Bonuses for Manufacturing

$$\Delta B39_t = \alpha_0 - \alpha_1 \Delta B39_{t-1} - \alpha_2 \Delta B39_{t-2} - \alpha_3 \Delta B39_{t-3} + \alpha_4 \Delta B39_{t-4} + \alpha_5 \Delta B52_{t-1} - \alpha_6 \Delta B52_{t-2} + \alpha_7 \Delta B52_{t-3} - \alpha_8 \Delta B52_{t-4} - \alpha_9 DQ1_t - \alpha_{10} DQ3_t - \alpha_{11} \left(B39_{t-1} - \beta B52_{t-1}\right)$$

B39	Bonus for manufacturing
B52	Bonus for finance and insurance
DQ_i	Seasonal dummy for quarter i

NONBONUS REAL AVERAGE WAGES

Once average nonbonus wages have been identified, they are divided by a price deflator estimated specifically for the New York economy (see "New York State Inflation Measure" below) to create nonbonus real average wages. To forecast nonbonus real average wages, DOB/N.Y. estimates 15 stochastic equations, one for each major industrial sector.

Statistical evidence suggests the existence of a long-run equilibrium relationship between the State sectoral nonbonus real average wage for most sectors and the national real average wage. Thus, the State nonbonus real average wage for most sectors is modeled in a cointegration/error-correction framework. This modeling approach is based on the belief that, since both labor and capital are free to move in a market economy, regional differences in labor costs will tend to disappear, although this process may take quite a long time. This formulation allows for short-run adjustments toward long-run equilibrium. These short-run dynamics account for the State's unique economic conditions. Table 8 gives an example of the formulation for the nonbonus real average wage.

For a few sectors, average real nonbonus wages are not modeled in the cointegration/error correction framework, since there is no statistical evidence that they are cointegrated with the national real average wage. These sectors are modeled within an autoregressive framework, with one or more U.S. variables (current or lagged values) used as explanatory variables to capture the impact of national economic conditions.

Table 8
Nonbonus Real Average Wage

$$\Delta RWA52_t = -\alpha_0 \Delta RWA52_{t-1} - \alpha_1 \Delta RWA52_{t-2} - \alpha_2 \Delta RWA52_{t-3} + \alpha_3 \Delta RWA52_{t-4} + \alpha_4 \Delta USRA_{t-1} - \alpha_5 TRATE3_t - \alpha_6 (RWA52_{t-1} - \beta_0 - \beta_1 USRA_{t-1})$$

RWA52	Real average wage of New York finance and insurance sector
USRA	Real average wage of U.S.
TRATE3	Interest rate on 3-month Treasury notes

NONWAGE INCOME

The six components of nonwage income are estimated individually. These components are the residence adjustment; personal contributions to social insurance programs, primarily Social Security; transfer payments; property income; proprietors' income; and other labor income. Each of the two largest components, transfer payments and property income, accounts for more than 40 percent of total nonwage income.

All New York nonwage income components, except for the residence adjustment, are driven by their national counterparts since they are either governed by Federal regulations or influenced by national conditions. In each of these equations, the change in the New York component of nonwage income is estimated as a function of the change in its U.S. counterpart, along with lags of the independent and dependent variables to account for short-term dynamics. Table 9 gives an example of the formulation for nonwage income.

Some of the nonwage equations use the concept of New York as a share of the national total to help explain the trend in the New York variable relative to the U.S. variable. The property income equation includes New York's employment share; the transfer income equation includes New York's population share; and the equation for contributions for social insurance includes New York's wage share. The residence adjustment is modeled as a function of New York earned income, which is comprised of wages, other labor income, and personal contributions for social insurance.

Table 9
Nonwage Income Components

$$\Delta \ln PROP_t = \alpha_0 + \alpha_1 \Delta \ln P_t + \alpha_2 \Delta \ln P_{t-1} - \alpha_3 \Delta \ln P_{t-2} + \alpha_4 \Delta \ln PROP_{t-1} + \alpha_5 \Delta \ln PROP_{t-2}$$

PROP	Property income of New York State
P	U.S. property income*(New York employment / U.S. employment)

NEW YORK STATE INFLATION RATE

DOB/N.Y. estimates a measure of State inflation by constructing a composite consumer price index for New York State (CPINY). The CPINY is defined as a weighted average of the national CPI and the CPI for the New York City region. The CPINY equation, as shown in Table 10, is specified as a simple autoregressive process with national CPI as an explanatory variable.

Table 10
Composite CPI for New York

$$\Delta \ln CPINY_t = \alpha_0 + \alpha_1 \Delta \ln CPINY_{t-1} + \alpha_2 \Delta \ln CPI_t - \alpha_3 \Delta \ln CPI_{t-4} + \alpha_4 (RUNY - RUUS)_{t-3}$$

CPINY	New York consumer price index
CPI	National consumer price index
RUNY	New York unemployment rate
RUUS	U.S. unemployment rate

NEW YORK STATE UNEMPLOYMENT RATE

The New York unemployment rate equation, shown in Table 11, is specified as a simple autoregressive process with the national unemployment rate (current and lagged) as an explanatory variable.

Table 11
New York Unemployment Rate

$$RUNY_t = \alpha_0 + \alpha_1 RUNY_{t-1} + \alpha_2 RUUS_t - \alpha_3 RUUS_{t-1}$$

RUNY	New York unemployment rate
RUUS	U.S. unemployment rate

NEW YORK STATE ADJUSTED GROSS INCOME

Annual data pertaining to the number of tax returns and the components of New York State adjusted gross income (NYSAGI) are obtained from samples taken from the State taxpayer population by the New York State Department of Taxation and Finance. Single-equation econometric models are used to project the future number of returns, as well as all the components of income except for the largest component, wages. To ensure consistency with DOB's New York economic forecast, the forecast growth rate for State wages and salaries derived from DOB/N.Y. is applied to the wage base obtained from the taxpayer sample.

In almost all cases, the data series on the components of NYSAGI are found to be nonstationary. Therefore, to avoid being misled by spurious regression results, a logarithmic transformation is performed and then first-differenced for all series for which at least 20 observations are available. Shorter series are modeled in levels.

In constructing the sample, the Department of Taxation and Finance tries to capture as accurately as possible the characteristics of the State taxpayer population. However, it is unreasonable to expect that every component of income will be perfectly represented for each and every year. Dummy variables are incorporated into models where anomalies in the data are thought to be the product of sampling error. Detailed descriptions of the models for the number of returns and for the major components of NYSAGI, other than wages, are presented below.

TAX RETURNS

The number of tax returns is expected to vary with the number of households that earn any kind of income during the year. The number of such households, in turn, should be closely associated with the number of individuals who are either self-employed, employed by others, or earn taxable income from a source other than labor. Most taxable income is earned as wages and salaries. Growth in the number of returns due to an increase in the number of people employed is captured by the inclusion of total State payroll employment, which is forecast within DOB/N.Y.

New Yorkers can earn taxable income from sources other than payroll employment, such as self-employment and real and financial assets. Self-employment is expected to be closely related to proprietors' income, a component of the NIPA definition of State personal income that is available from BEA and forecast within DOB/N.Y. Another component of personal income that is forecast within DOB/N.Y. — State property income — includes additional forms of taxable income such as interest, dividend, and rental income. The DOB tax return model incorporates the sum of proprietors' and property income for New York, deflated by the consumer price index for New York as constructed by DOB.

A one-time upward shift in the number of tax returns is observed in 1987, believed to be related to the Tax Reform Act of 1986. Beginning in 1987, the two-earner deduction for married couples was eliminated, reducing the incentive for married couples to file joint tax returns. To capture this effect, a dummy variable for 1987 is added to the model. A dummy variable for 2000 is also included to account for difference in the processing of tax files. The equation specification is shown in Table 12.

Table 12
Tax Returns

$$\Delta \ln RET_t = \alpha_0 + \alpha_1 \Delta \ln NYSEMP_t + \alpha_2 \Delta \ln((PROPNY - YENTNY)/CPI)_t + \alpha_3 D87_t + \alpha_4 D00_t$$

RET	Number of tax returns
NYSEMP	Total State employment
PROPNY	State property income
YENTNY	State proprietors' income
CPI	Consumer Price Index
D87	Dummy variable for 1987 tax law change
D00	Dummy variable for 2000 processing changes

POSITIVE CAPITAL GAINS REALIZATIONS

New York State's positive capital gains realizations forecasting model incorporates those factors that are most likely to influence realization behavior: expected and actual tax law changes, as well as stock market activity. Realization behavior appears to exhibit two types of responses to changes in tax law: a transitory response to an expected change in the law and a steady-state response to an actual change. For example, if the tax rate is expected to rise next year, then taxpayers may realize additional gains this year, in order to take advantage of the lower rate. However, in the long run, the higher tax rate should result in a lower level of current realizations, all things being equal. Based on Miller and Preston (2000), the transitory response variable is specified as the square of the difference between the rate expected to take effect next period and the current period rate, with the sign of the difference preserved. The long-term response variable is the current steady-state tax rate.

The growth in realizations is also expected to be directly related to growth in equity prices. To capture this effect, the average price of all stocks traded is incorporated into the model. The average stock price forecast is based on the forecast for the S&P 500 from DOB/U.S. In order to capture the impact of accumulated capital losses, the model also includes prior year stock market activity. Because of a historically large estimated loss carryover following three years of decline in equity prices, and the lack of historical experience with respect to the duration and magnitude of these declines, adjustments are made to the model forecast for the period from 2003 to 2008, to more effectively account for the anticipated impact of accumulated losses. The equation specification is shown in Table 13.

Table 13
Positive Capital Gains Realizations

$$\Delta \ln CG_t = \alpha_0 - \alpha_1 \Delta TRSTX_t - \alpha_2 \Delta PRMTX_t + \alpha_3 \Delta \ln EQTYP_t + \alpha_4 \Delta \ln EQTYP_{t-1} - \alpha_5 D01_t$$

CG	Positive capital gains realizations
TRSTX	Transitory tax measure
PRMTX	Permanent tax rate
EQTYP	Average price of stocks traded
D01	Dummy variable for 2001

POSITIVE RENT, ROYALTY, PARTNERSHIP, S CORPORATION, AND TRUST INCOME

The largest component of New York's positive partnership, S corporation, rent, royalty, estate and trust gains (PSG) is partnership income, much of which originates within the finance industry. Therefore, growth in PSG is believed to be related closely to overall economic conditions, as represented by real U.S. GDP, as well as to the performance of the stock market, as represented by the S&P 500.

An almost equally large contributor is income from closely held corporations organized under subchapter S of the Internal Revenue Code known as S corporation. Selection of S corporation status allows firms to pass earnings through to a limited number of shareholders and to avoid corporate taxation. Empirical work shows that the differential between personal income tax and corporate income tax rates can significantly affect election of S corporation status. [1] Consequently, DOB's forecast model includes the difference between the corporate franchise tax rate and the maximum marginal personal income tax rate, where the rates are composites of both State and Federal rates.

Changes in tax law are believed to account for some of the volatility in PSG. The enactment of the Tax Reform Act of 1986, which created additional incentives to elect S corporation status, resulted in an unusually high rate of growth in this component of income in the late 1980s. In particular, we observe an unusually high rate of growth in this component in 1988 that was followed by extremely low growth in 1989. Possible explanations are the expectation of a large tax increase after 1988, or an increase in the fee for electing S corporation status in 1989. This effect is captured by a dummy variable that assumes a value of one for 1988 and minus one for 1989. The equation specification is shown in Table 14.

Table 14
Positive Partnership, S Corporation,
Rent, Royalty, Estate and Trust Income

$$\Delta \ln PSG_t = \alpha_0 + \alpha_1 \Delta MTR_t + \alpha_2 \Delta \ln JS_t + \alpha_3 \Delta \ln GDP_t + \alpha_4 D88\_89_t$$

PSG	Partnership, S corporation, Rent, Royalty, Estate and Trust income
MTR	Difference in Maximum Marginal Tax Rate between Corporate and Personal Income Tax
JS	Standard and Poor's 500 stock index
GDP	Real GDP
D88_89	Dummy variable, 1 for 1988 and -1 for 1989

DIVIDEND INCOME

Dividend income is expected to rise with the fortunes of publicly held U.S. firms, which, in turn, are expected to vary with the business cycle. For example, during the State's last recession, dividend income declined for four consecutive years from 1989 to 1992. Because a strong (or weak) economy, as measured by growth in real U.S. gross domestic product, might have a sustained impact on the payout of dividends, the impact of the business cycle on dividend income is modeled as a polynomial lag in real U.S. GDP. Dividend income is also thought to be associated with firms' expectations pertaining to their future profitability,

[1] See for example R. Carroll and D. Joulfaian "Taxes and Corporate Choice of Organizational Form," OTA Paper 73, Office of Tax Analysis, U.S. Treasury Department, Washington, DC, October 1997.

which is expected to be tied to the future strength of the economy. Because interest rates incorporate inflation expectations, which in turn incorporate expectations regarding the future strength of the economy, they represent a proxy for the latter. Interest rates are represented by the rate on the 10-year Treasury note.

Historically, State dividend income has ranged from a decline of 6 percent in 1991 to an increase of 22 percent in 1981, proving much more variable than U.S. dividend income, a component of the NIPA definition of U.S. personal income. This may suggest the importance of factors affecting the way taxpayers report their income, rather than changes in the payment of dividends by firms. The most obvious impact of a change in the tax law occurred in 1988, when reported dividend income grew 21.8 percent, followed by a decline of 2.6 percent the following year. A dummy variable is included to control for what is assumed to be the impact of the Tax Reform Act of 1986 on the reporting of taxable dividend income.

Dummy variables are also included to capture the extraordinary impact of recessions (1975, 1990, 1991, 1992, 2001, half of 2002) beyond what is captured by fluctuations in real U.S. GDP. The equation specification is shown in Table 15.

Table 15
Dividend Income

$$\Delta \ln DIV_t = \alpha_0 + \alpha_1 \Delta TRATE10_t + \alpha_2 \Delta \ln JS_t - \alpha_3 DREC_t + \alpha_4 D88\_89_t$$

DIV	Dividend income
TRATE10	Interest rate on 10-year Treasury notes
JS	Standard and Poor's 500 stock Index
DREC	Recession dummy variable
D88_89	Dummy variable, 1 for 1988 and -1 for 1989
D98	Dummy variable

INTEREST INCOME

For a given amount of assets, an increase in interest rates will increase interest income. DOB's interest income forecasting model is based on this simple concept and accordingly includes the ten-year Treasury rate. In addition, the overall trend in taxable interest income for New York is found to closely track that of U.S. interest income, another component of the NIPA definition of U.S. personal income. However, taxable interest income for New York is much more volatile than the latter measure. For the period from 1976 to 2000, the average growth rate for U.S. interest income was 9.2 percent, with a standard deviation of 7.6 percentage points. In contrast, New York's interest income over the same period averaged 6.5 percent growth, with a standard deviation of over 13.0 percentage points. The additional volatility in the New York series could be related to the behavioral response of State taxpayers to past changes in the tax law related to interest income. A dummy variable is included to capture the extraordinary decline in 1992 beyond what would have been expected due to the changes in interest rates. The equation specification is shown in Table 16.

Table 16
Interest Income

$$\Delta \ln INT_t = -\alpha_0 + \alpha_1 \Delta \ln USINT_t + \alpha_2 \Delta TRATE10_t - \alpha_3 D92_t$$

INT	Interest income
USINT	U.S. interest income (NIPA definition)
TRATE10	Interest rate on 10-year Treasury notes
D92	Dummy variable

BUSINESS INCOME

Business income combines income earned and reported as a result of operating a business or practicing a profession as a sole proprietor, or from operating a farm. Such income is expected to vary with the overall condition of the State and national economies. The inclusion in the model of State proprietors' income, a component of the NIPA definition of New York personal income, which is forecast within DOB/N.Y., insures consistency between DOB's New York forecast and the forecast of this component of NYSAGI. Real U.S. GDP, forecast under DOB/U.S., captures the impact of the national business cycle, which might not be captured by the NIPA definition of State proprietors' income. In addition, a dummy variable is included to capture the downward shift in reported business income growth for the period from 1989 onward, perhaps due to new firms registering as S-corporations rather than sole proprietorships, in order to take advantage of more favorable laws pertaining to liability. The equation specification is shown in Table 17.

Table 17
Business Income

$$\Delta \ln BUS_t = \alpha_0 - \alpha_1 \Delta \ln BUS_{t-1} + \alpha_2 \Delta \ln YENTNY_t + \alpha_3 \Delta \ln GDP_t - \alpha_4 D89_t$$

BUS	Sole proprietor and farm income
YENTNY	State proprietor income (NIPA definition)
GDP	Real U.S. GDP
D89	Dummy variable =1 for 1989 onward; 0 otherwise

PENSION INCOME

Pension income includes payments from retirement plans, life insurance annuity contracts, profit-sharing plans, military retirement pay, and employee savings plans. Pension income is linked to long-term interest rates, suggesting that firms base the level of pension and life-insurance benefits they offer to employees on their expectations of future profitability, which is tied to the future strength of the economy. As indicated above, interest rates represent a proxy for the latter. Pension income has grown steadily over the years, although the growth rate has declined considerably over time despite an aging population. While the average annual growth rate between 1978 and 1989 was 13.4 percent, it fell to 7.3 percent between 1990 and 2001. This coincides with a decline in the 10-year Treasury rate from 10.3 percent in the earlier years to 6.5 percent in the later years.

Table 18
Pension Income

$$\Delta ln\, PEN_t = \alpha_1 \Delta TRATE10_{t-1} - \alpha_2\, AR1 - \alpha_3\, D89_t - \alpha_4\, D92_t + \alpha_5\, D94_t$$

PEN	Pension income
TRATE10	Interest rate on 10-year Treasury notes
AR1	First order autoregressive term
D89	Dummy variable, 1 for 1989, 0 otherwise
D92	Dummy variable, 1 for 1992, 0 otherwise
D94	Dummy variable, 1 for 1994, 0 otherwise

PERSONAL INCOME TAX

BACKGROUND

The New York State (NYS) personal income tax was originally enacted in 1919. The present system of conformity to the Federal definition of adjusted gross income and of itemized deductions, however, did not begin until 1960. Over the years, the State has undergone several major tax law reforms. The current tax structure has been greatly simplified over the last decade, and the tax burden considerably reduced since 1995.

The computation of the personal income tax starts with the addition of income components[1] to arrive at Federal gross income. The Internal Revenue Code permits certain exclusions and adjustments in arriving at Federal adjusted gross income (FED AGI). In addition, NYS requires certain modifications to FED AGI to calculate NYS adjusted gross income (NYS AGI). NYS AGI is reduced by the larger of the NYS standard deduction or itemized deductions. NYS itemized deductions generally conform to Federal itemized deductions, with certain modifications, such as the add-back of State and local income taxes. NYS conforms to Federal law, which limits itemized deductions for taxpayers with FED AGI above a certain amount. NYS applies a further deduction limitation to upper-income taxpayers. NYS taxpayers may also subtract from NYS AGI a $1,000 exemption for each dependent, not including the taxpayer and spouse, to determine taxable income.

Taxpayers apply a graduated tax rate schedule to their taxable income to compute their tax. Those with NYS AGI above $100,000 must calculate a supplemental tax to recapture the benefit of the lower brackets. Finally, taxpayers, if qualified, may subtract certain credits[2] to arrive at their actual liability.

DATA SOURCES

Data on the personal income tax (PIT) come from various sources.

PIT Study Files

PIT study files are created every year by the NYS Department of Taxation and Finance. For any given year, the study file represents a stratified statistical sample of about 100,000 income tax returns with detailed information including:

1. marital and resident status
2. components of income and Federal and NYS adjusted gross incomes
3. standard deduction or components of itemized deductions
4. number and amount of exemptions
5. liability and credits

Since the study files are only a sample of the taxpayer universe, each of the roughly 100,000 records must have a weight assigned to it so that, when fully expanded, the file reflects all PIT returns in NYS (approximately nine million).

There is a two-year lag between the current year and the year of the latest complete PIT study file. For instance, the actual 2001 PIT study file became available in the fall of 2003. Therefore, liability for calendar year 2002 must be estimated from the 2001 data file before liability for 2003 and the outyears can be projected.

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[1] These income components include: wages, salaries and tips; interest and dividend incomes; State and local income tax refunds; alimony received; net business and farm incomes; capital gains and losses; IRA distributions and pensions and annuities; rents and royalties; incomes from partnerships, S corporations and trusts; unemployment compensation; and taxable social security benefits.

[2] Under current law, NYS allows the following major credits: earned income tax credit, household credit, child and dependent care credit, real property tax circuit breaker credit, and agricultural property tax credit, and college tuition credit.

Cash Collection and Processing Reports

Daily, weekly, and monthly collection reports of withholding, estimated payments, and other components of collections are used extensively to keep track of PIT receipts on both a calendar and a fiscal year basis. These reports are generated by the Department of Taxation and Finance.

Each component of receipts follows a different reporting schedule. Withholding information is reported on a daily basis[3] while estimated payments follow a quarterly schedule (April-June-September-January). Final payments come mostly during the March-April-May period, and also in August and October, when returns are due for taxpayers receiving extensions. Refunds on timely filed returns must be issued within 45 days of the due date or within 45 days of the filing date, whichever is later. As a result, most refunds on timely filed returns are paid during the March-April-May period. Regardless of their individual schedules, all components of receipts are tracked monthly for cash flow purposes.

Other Types of Information

Federal data on NYS resident taxpayers are available from the Internal Revenue Service Statistics of Income (SOI) data tapes and reports. For instance, 2001 information on some of the income components for NYS residents was published in the late spring of 2003 in the SOI bulletin. Detailed information on the 2001 SOI public use data file will be available at a later date. The SOI information is particularly useful when the PIT study file is not available. It also serves as a benchmark against which to check the reasonableness of the PIT study file. Finally, the SOI data provides valuable Federal tax information missing from the New York study file.

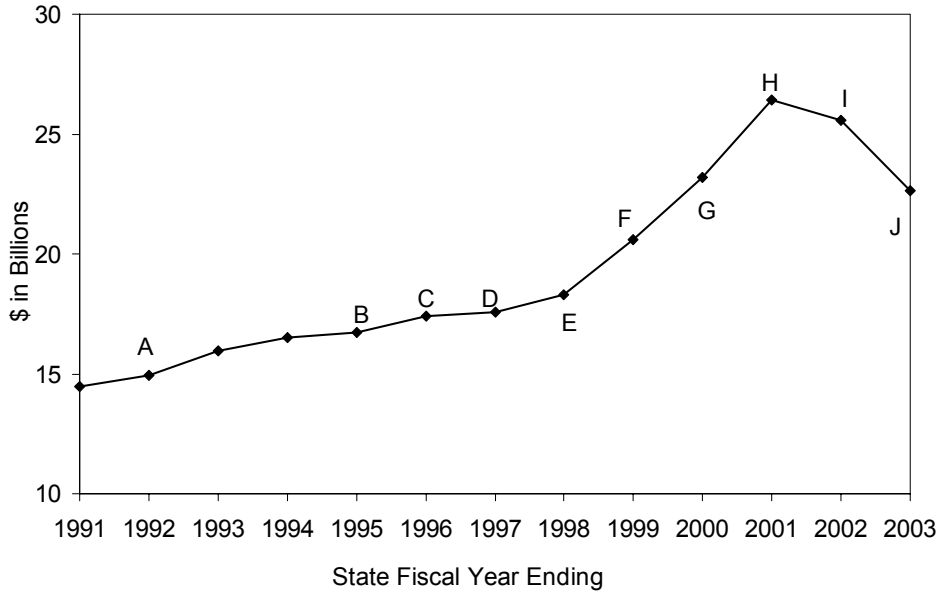
STATUTORY CHANGES

The following figure provides actual PIT tax receipts under current law for fiscal years 1991-92 to 2002-03. In addition, the graph shows the law changes that accrued in that period, indicating when PIT receipts were first affected.

[3] If an employer was required to remit $15,000 or more of withholding tax during the calendar year preceding the previous year, the employer must remit the tax on or before the third business day following the payroll date. If an employer was required to remit less than $15,000, the employer has up to five business days following the date of payroll to send payment for the withholding tax. Employers who are qualified educational organizations or health care providers must remit the tax on or before the fifth business day following the date of payment. Employers who have withheld, but not paid over, a cumulative aggregate amount of less than $700 at the close of a calendar quarter must remit the tax quarterly.

Current Law Personal Income Tax Receipts

SFY 1990-91 to 2002-03



A. 1991-92: Changed rate schedule for taxpayers with taxable wages in excess of $90,000 annually to account for the Federal limitation on itemized deductions and for the State tax table benefit recapture.

B. 1994-95: Reflected the enactment of the State earned income tax credit (EITC) at 7.5 percent of the Federal credit, effective for the 1994 tax year.

C. 1995-96: Reflected these changes for the 1995 tax year: increased standard deduction to $6,600 for single individuals, $10,800 for married couples; lowered the maximum rate to 7.59 percent and reduced the number of tax brackets; and increased EITC to 10 percent of the Federal credit.

D. 1996-97: Reflected these changes for 1996 tax year: increased standard deduction to $7,400 for single individuals, $12,350 for married couples; lowered the maximum rate to 7 percent and broadened the wage brackets to which the rates apply and increased the EITC to 20 percent of the Federal credit, increased the income levels for the Child and Dependent Care credit and made the credit refundable.

E. 1997-98: Reflected creation of the Agricultural Property tax credit for the 1997 tax year. In addition, reflected these changes for the 1997 tax year: increased standard deduction to $7,500 for single individuals, $13,000 for married couples; lowered the maximum rate to 6.85 percent and broadened the wage brackets to which the rate is applied.

F. 1998-99: Reflected these changes for the 1998 tax year: increased the Child and Dependent Care credit to 100 percent of the Federal credit for taxpayers with AGI up to $17,000 and phased down to 20 percent for incomes of $30,000 or more; changed the calculation of the Agricultural Property tax credit; created the Solar Energy credit; and created the College Choice Tuition Savings Program.

G. 1999-2000: For the Child and Dependent Care credit, reflected increases in the income levels for the range for phase down from 100 percent to 20 percent of the Federal credit, setting the range at $35,000 to $50,000 for the 1999 tax year.

H. 2000-01: Reflected these changes for the 2000 tax year: increased the Child and Dependent Care credit to raise the maximum to 110 percent of the Federal credit for incomes up to $25,000, with a phase down from 110 percent to 20 percent for incomes above $25,000; increased the State EITC to 22.5 percent of the Federal credit; and extended the Qualified Emerging Technology credit (QETC) to individuals in partnerships or S corporations.

I. 2001-02: Reflected these changes for the 2001 tax year: increased the State EITC to 25 percent of the Federal credit; provided the first phase of a three-year reduction of the marriage penalty; and provided the first phase of a four-year phase-in of the tuition deduction/credit

J. 2002-03: Reflected these changes for the 2002 tax year: increased the State EITC to 27.5 percent of the Federal credit; provided the second phase of a three-year reduction of the marriage penalty; and provided the second phase of a four-year phase-in of the tuition deduction/credit.

FORECAST METHODOLOGY

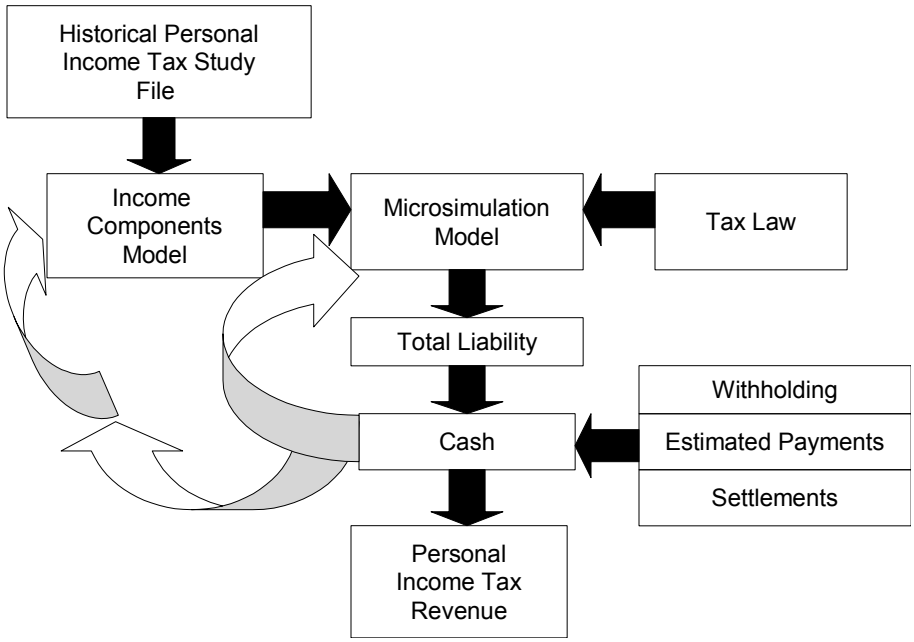
The estimating/forecasting process for the NYS personal income tax is composed of three major components. They are:

1. *The adjusted gross income model* utilizes a set of econometric models to project the individual income components that make up gross income, and forecasts them over a five-year interval.
2. *The PIT micro-simulation model* uses the PIT study file and results from the AGI model to forecast PIT liability over the forecast interval. The simulation model is also used to assess the impact of tax law changes and perform "what-if" analyses.
3. *The liability-to-cash models* consist of mapping calendar-year liability to fiscal-year cash estimates and of monitoring day-to-day actual cash receipts and refunds.

All three components of the estimation and forecasting process are closely interconnected. (See the figure below.)

- Information on individual income components from past PIT studies (up to tax year 2001 in this 2004-05 fiscal year budget cycle) serves as historical data for the AGI model of income components. In turn, forecast results from the AGI model, after necessary adjustments based on the latest available cash information (from tax year 2002), are fed into the PIT micro-simulation model.
- The most recent PIT study file is the starting point for the micro-simulation model. In the forecasting mode, the PIT study file is adjusted to reflect the results from the AGI model. The adjusted data are entered into the PIT micro-simulation model to forecast PIT liability, which, in turn, feeds into the cash estimating process. However, where information on PIT collections is already available (the 2002 tax year in our instance), cash results help determine the income and liability targets for the PIT micro-simulation model.
- The liability forecast from the PIT micro-simulation model is used for projection of cash receipts for future years.

Components of the NYS PIT Forecasting Process



In the current fiscal year, cash information sets constraints on the income components analysis and the micro-simulation model outcome. (See white arrows in the figure above.) Conversely, for outyear projections, where no cash information is available, economic assumptions and micro-simulation estimates of liability drive the cash estimates. (See black arrows in the figure.)

Detail on the AGI forecasting model can be found in the "Economics" chapter of this methodology. The following section describes each of the remaining components of the PIT forecasting process.

The PIT Micro-simulation Model

The PIT micro-simulation model emulates a NYS tax form. More specifically, it takes the individual income and deduction components from each record in the PIT study file and computes for each of those records AGI, the final amounts of deductions and exemptions allowed, taxable income, and taxes before and after credits, as well as the various credits allowed. Finally, it inflates each record by its assigned weight. The grand total of all the weighted records corresponds to the entire taxpaying population in the State. Total simulated results for AGI, deductions, and liability closely match the aggregate corresponding values from the study. The following table shows the annual percentage changes for NYS personal income tax components and liability for the 1996 to 2001 PIT study files.

NYS PERSONAL INCOME TAX COMPONENTS AND LIABILITY
ANNUAL PERCENTAGE CHANGES
1996-2001 CALENDAR YEAR ACTUALS

Income Component	1996	1997	1998	1999	2000	2001
Number of Returns	1.4	1.4	2.4	1.7	5.1	(1.1)
Wages and Salaries	5.0	7.4	8.3	6.2	12.0	2.2
Interest Income	1.1	0.2	3.5	(2.9)	20.9	(7.5)
Dividend Income	8.3	11.9	(3.4)	9.4	18.2	(19.3)
Taxable Pension	4.6	9.0	(0.3)	10.4	6.1	4.7
Refund	4.8	3.7	3.9	8.1	15.7	5.8
Alimony	9.7	8.0	5.5	(7.5)	12.2	2.5
Total Capital Gains	59.3	40.7	23.3	24.1	28.9	(52.7)
Total Rent, Royalty & Partnership	30.2	17.9	6.9	18.3	2.8	2.7
Net Business & Farm Income	11.4	4.8	2.8	5.1	8.1	2.8
Unemployment Income	(11.7)	(12.7)	(2.9)	4.7	3.3	53.6
Social Security Income	11.2	16.3	2.0	5.8	25.7	0.7
Total Other Income	88.2	(46.6)	207.5	(46.4)	178.0	(15.2)
IRA Income	16.7	13.7	39.2	9.2	19.1	(9.3)
Gross Income	8.4	9.9	8.3	8.5	13.2	(4.7)
Total NYS AGI	8.3	10.1	9.1	8.4	13.5	(5.2)
Liability	1.9	3.9	12.0	10.5	16.8	(8.5)

In the forecast mode, the micro-simulation model incorporates information from the AGI model to "age" the latest study file (2001 tax year) and forecasts calendar year liability for the outyears. This aging process includes two major steps. The first step consists of growing the total number of returns and the PIT income components by groups of deciles while at the same time reflecting the overall econometric forecast for each of the income components. In the second step, the weight of each return is adjusted through a convergence algorithm so that all the overall and distributional income targets are achieved simultaneously, while minimizing the adjustment to the weight.

As mentioned earlier, however, in the first year of that interval (the 2002 tax year in this case), much information is available from actual cash receipts and, by late December 2003, from the processing of actual 2002 returns by the Department of Taxation and Finance. This processing information includes the number of tax returns processed, the amount of AGI, and liability reported to date on returns, as well as the distribution of returns by income class and

by resident status. The micro-simulation model must reflect this processing information and "age" the study file for the 2002 liability year so the simulation results will match the available aggregate and distributional targets for that year.

A major strength of the PIT micro-simulation model is that in addition to estimating/forecasting current law, it also allows the policy analyst to perform "what-if" analyses, explore different tax scenarios, and assess the impact of policy changes on various taxpayer groups. For instance, what if the law is changed to increase the standard deduction, the exemption amount, or the top tax rate? What if NYS enriches the current earned income tax credit? What would be the fiscal impact of any of these changes on State revenues? How would various income groups or filing statuses benefit or lose under a proposal? In general, who would gain or lose from a particular tax proposal and by how much?

The Cash-to-Liability Process

The cash-to-liability process involves monitoring all available collection information for the different components of the personal income tax to better estimate current year receipts and to improve our estimates of current year liability. Year-to-year liability growth, along with the actual daily, weekly and monthly collections, is used as a guide for growth in cash collections.

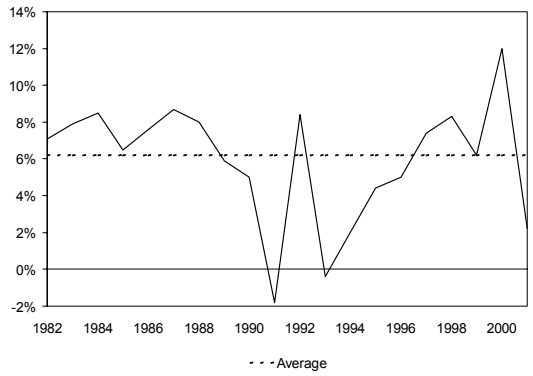
The components of PIT cash liability include withholding (current year and prior year), estimated payments (current year vouchers and extensions), final returns, delinquencies (assessments and prior year returns), and refunds (current, prior, minor offsets, State/City offsets, credit to estimated payments). The "settlement" consists of final returns, extension payments, and refunds. The table below lists the actual components of PIT cash for the 2002-03 State fiscal year and the estimated components for the 2003-04 State fiscal year, while the first figure plots the percent changes for the main components of adjusted gross income for calendar years 1982 through 2001. The next figure shows the major components of PIT cash over the 2002-03 State fiscal year. The following figure displays the 12-month moving average of withholding collections and of total personal income tax collections. The last three figures show the components of cash liability over time, estimated payments and withholding as a percentage of liability over time, and refunds paid as a share of withholding collections.

COMPONENTS OF PIT CASH
2002-03 AND 2003-04 FISCAL YEARS
(millions of dollars)

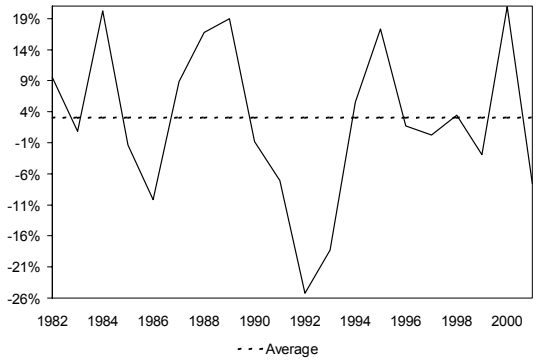
PIT Component	2002-03 Actuals	2003-04 Estimate	Change	Change(Percent)
Withholding	19,959	22,085	2,126	10.7
Estimated Tax	4,855	5,130	275	5.7
-- *Current*	3,831	4,295	464	12.1
-- *Prior* (IT-370)	1,024	835	(189)	(18.5)
Returns	1,334	1,275	(59)	(4.4)
-- *Current*	1,232	1150	(82)	(6.7)
-- *Subsequent*	101	125	24	23.8
Delinquencies	797	595	(202)	(25.3)
-- *Assessed*	677	530	(147)	(21.7)
-- *Returns (prior)*	120	65	(55)	(45.8)
Gross	26,945	29,085	2,140	7.9
Refunds	4,296	4,425	129	3.0
Current	2,780	2,945	165	5.9
-- Refunds	2,678	2,845	167	6.2
-- Offsets	102	100	(2)	(2.0)
Subsequent	960	960	0	0.0
Prior w/offsets	268	250	(18)	(6.7)
State/City	288	270	(18)	(6.3)
Net Total	22,648	24,660	2,012	8.9
Reserves	1,050	(577)	(1,627)	
Reported	23,698	24,083	385	1.6
"STAR"				
Special Fund	(2,664)	(2,835)	(171)	6.4
RBTF	(4,243)	(5,457)	(1,214)	28.6
General Fund	16,791	15,791	(1,000)	(6.0)

New York State Personal Income Tax
Components Annual Percentage Changes
1982 to 2001 Calendar Years

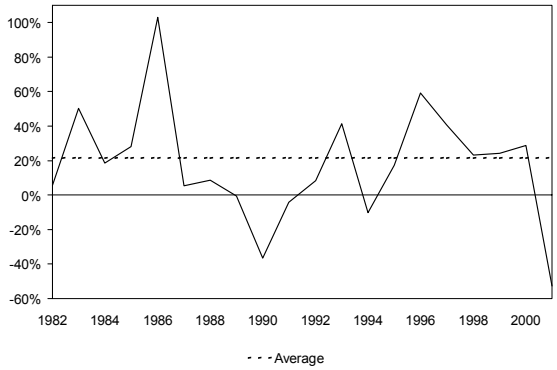
Wages and Salaries



Interest Income

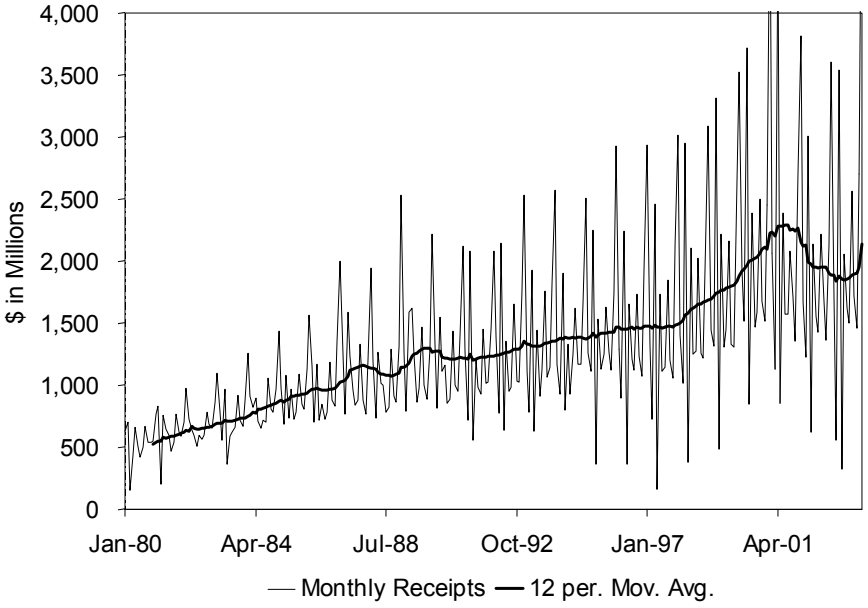


Capital Gains

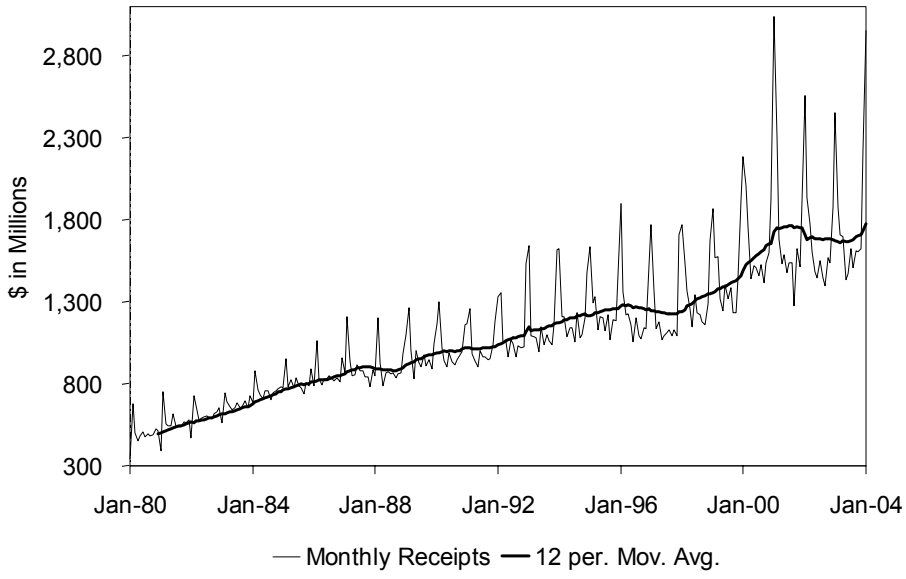


Dividend Income

Personal Income Tax Monthly Receipts

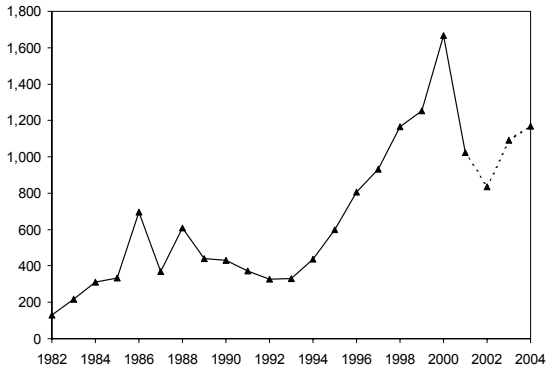


Personal Income Tax Monthly Withholding Receipts

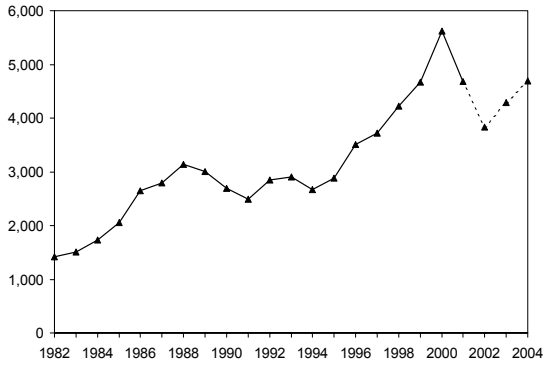


Components of PIT Cash Liability
1982 to 2004 Tax Years
(millions of dollars)

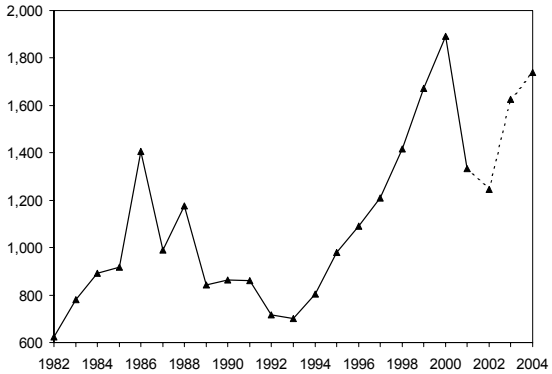
IT 370 Extensions



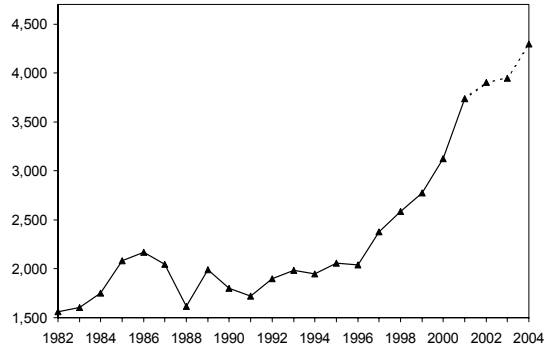
Current Year Estimated Payments



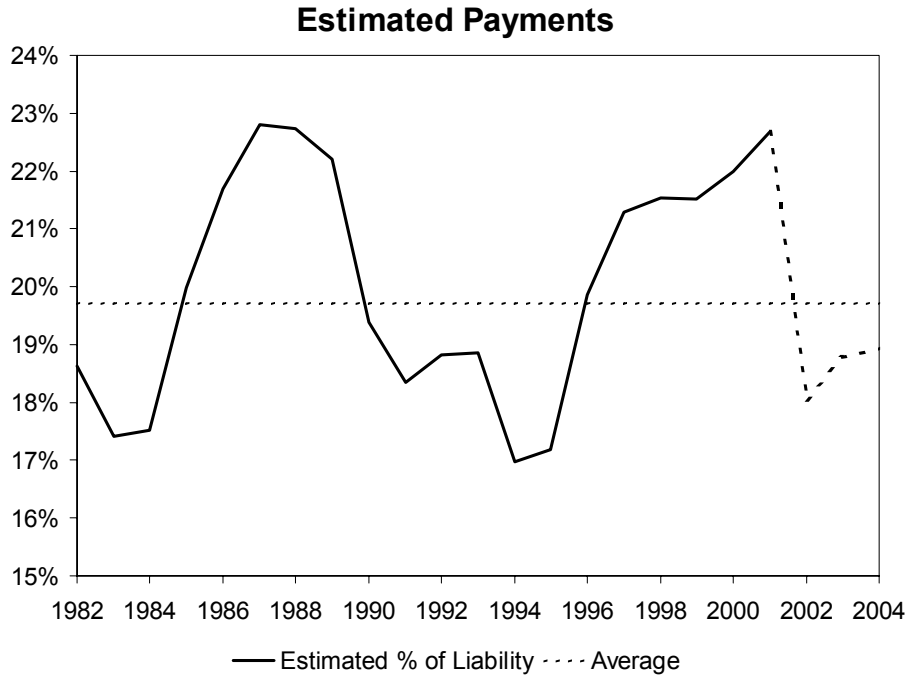
Final Payments

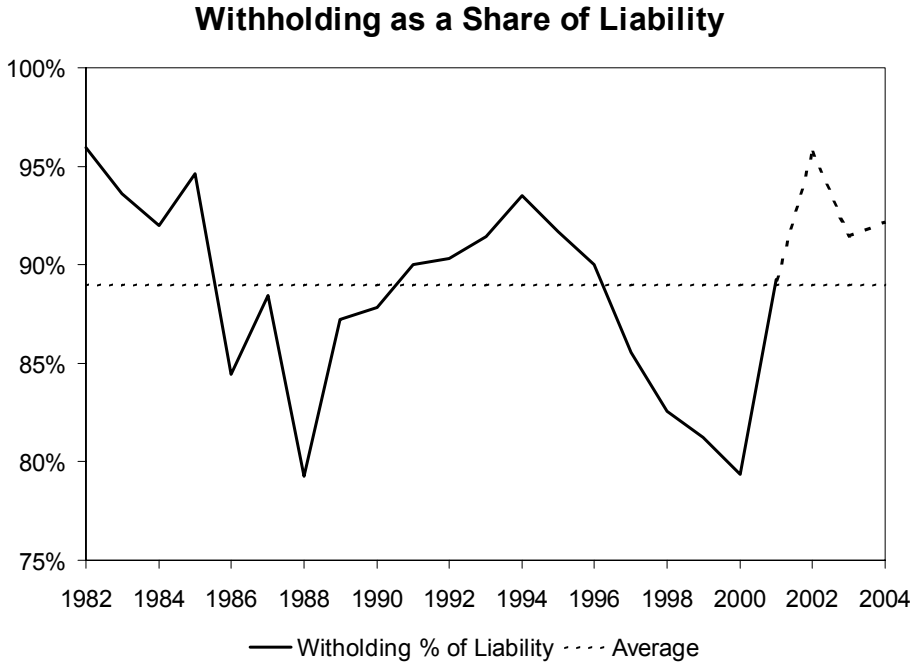


Refunds

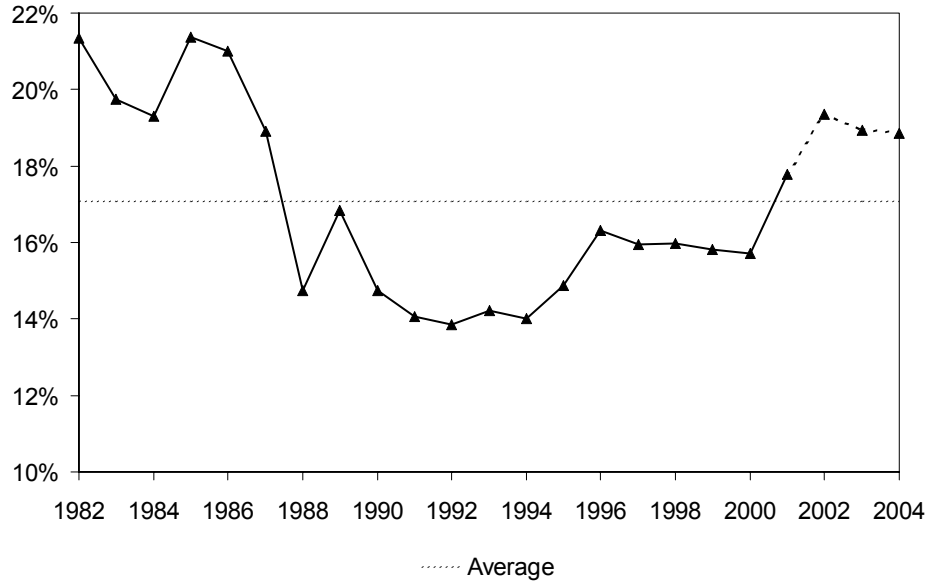


Estimated Payments and Withholding as a Percent of Liability
1982 to 2004 Tax Years

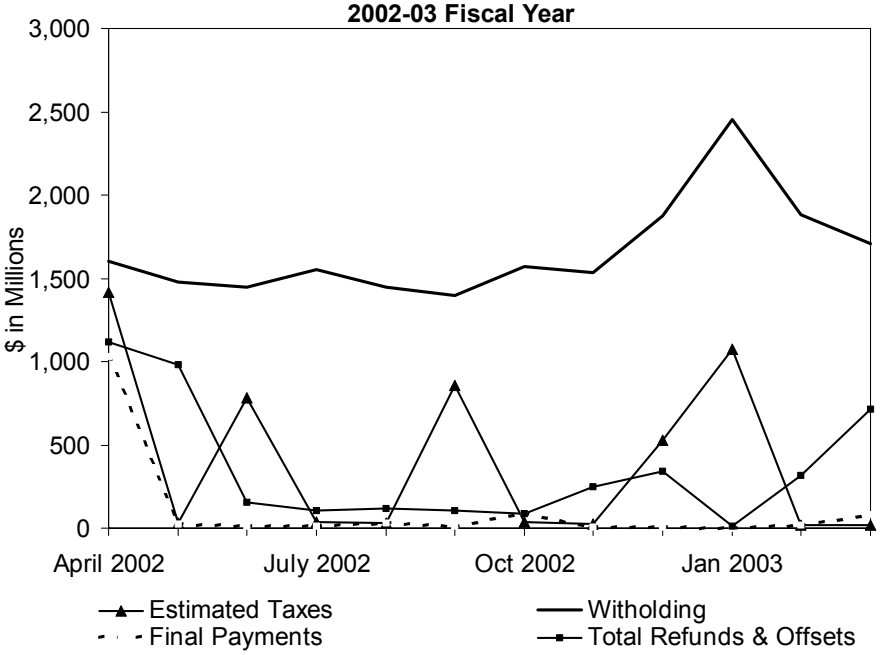




Refunds as a Percentage of Withholding
1982 – 2004 Tax Years



Main Components of Pit Cash Liability
2002-03 Fiscal Year



As stated earlier, information regarding the various components of tax collections is received on a daily, weekly, and monthly basis. Staff monitors tax collections and other information closely throughout the year to assess the performance of the estimates. For example, as a $20 billion component of collections, withholding collections generally are followed on a daily basis throughout the year, while payments with returns and extension requests as well as refunds are monitored most intensively in April and May of each year.

An all-encompassing report on cash collection components of the personal income tax is received from the Department of Taxation and Finance mid-month for the prior month. This report is used to determine the official cash flow for the month. Armed with this information, staff compares the original estimate for the month, and for the entire fiscal year, with all available actual cash information on each of the components. At the end of each quarter, this information is used, along with historical information and any pertinent legislative changes, to make necessary adjustments to the cash liability estimate.

Another critical aspect of the cash-to-liability process is forecasting the different components of receipts on a fiscal-year basis using results from the PIT simulation as a benchmark. Various methodologies are applied for different components of receipts.

The largest component of income tax collections, withholding tax, is estimated based on quarterly forecasts of NYS wages. Withholding is estimated using two alternative methodologies. One method applies a withholding-to-wage growth elasticity to the forecasted growth rates for wages on a quarterly basis to estimate withholding growth rates for each quarter in the forecast period. The elasticity used for each quarter is based on historical elasticity trends and expected future elasticity changes.

The second method employs an econometric model to forecast withholding based on independent variables, including wages and shift variables reflecting law changes. More specifically, withholding is a function of quarterly wages, seasonal effects, and dummy variables for tax law changes. The wage impact is expected to vary by quarter. This effect is captured by multiplying wages with quarterly dummies. The form of the estimating equation is outlined below. The error term exhibits autocorrelation at seasonal frequencies. An autocorrelation correction is applied to the error term and the structural parameters are reestimated. The results are summarized in the following table.

The model is estimated in levels using quarterly data starting in 1975 and running through the fourth quarter of 2003. The summary table shows that the model fit is good and there is no evidence of serial correlation after correction. The elasticity estimates derived from the model are consistent with *a priori* expectations — we expect withholding to increase (decrease) at a faster rate than wages as people move through the graduated tax brackets. Given that the model is estimated in levels, the elasticities are calculated as arc elasticities computed using a year of data. The elasticities for each quarter fall in the range of 1.17 to 1.21. The tax dummies are of the right sign and for the most recent law changes (dating back to 1987) quite significant.

DERIVED ELASTICITIES — SUMMARY STATISTICS

Wage by Quarter	Derived Elasticity 2002	Coefficient Estimate	t-statistic
Quarter 1	1.17	.072	42.47
Quarter 2	1.21	.065	29.90
Quarter 3	1.21	.065	28.88
Quarter 4	1.19	.062	32.98
Summary Statistic			
R2	.9976		
Durbin-Watson	2.0758		

WITHHOLDING

$$\mathbf{W_t} = \beta_0 + \beta_1 \text{DWAGE1}_t + \beta_2 \text{DWAGE2}_t + \beta_3 \text{DWAGE3}_t + \beta_4 \text{DWAGE4}_t + \alpha_1 \text{TAX1}_t + \alpha_2 \text{TAX2}_t + \alpha_3 \text{TAX3}_t + \alpha_4 \text{TAX4}_t + \alpha_5 \text{TAX5}_t + \alpha_6 \text{TAX6}_t + \alpha_7 \text{TAX7}_t + \alpha_8 \text{TAX8}_t + \alpha_9 \text{TAX9}_t + \alpha_{10} \text{TAX10}_t + \alpha_{11} \text{TAX11}_t + \alpha_{12} \text{TAX12}_t + \alpha_{13} \text{TAX13}_t + \delta_1 S1_t + \delta_2 S2_t + \delta_3 S3_t$$

W Withholding

DWAGEi… Equals wages if period t is the i^{th} quarter of the calendar year; 0 otherwise

S_i Seasonal dummies i = 1...3

Note: The dummy variables TAX1 through TAX13 equal 1 in the following time periods, 0 otherwise:

TAX1: second quarter of 1980 and thereafter, reduction in top tax rate.

TAX2: quarter of 1981 and thereafter, reduction in top tax rate.

TAX3: fourth quarter of 1981 and thereafter, increased personal exemption and standard deduction.

TAX4: third quarter of 1985 and thereafter, reduction in top tax rate, increased personal exemption and standard deduction.

TAX5: second quarter of 1987 and thereafter, reduction in top tax rate and broadened wage brackets, increased personal exemption and standard deduction.

TAX6: fourth quarter of 1987 and thereafter, reduction in top tax rate and adopted individual bracket structure for all, increased personal exemption and standard deduction.

TAX7: fourth quarter of 1988 and thereafter, reduction in the top tax rate, increased standard deduction.

TAX8: fourth quarter of 1989 and thereafter, adopted new rate schedule with top rate of 7.875, increased standard deduction.

TAX9: fourth quarter of 1991 and thereafter, change in rate schedule for State tax table benefit recapture.

TAX10: third quarter of 1995 and thereafter, reduction in the top tax rate and the number of wage brackets, increased standard deduction.

TAX11: second quarter of 1996 and thereafter, reduction in the top tax rate and broadened wage brackets, increased standard deduction.

TAX12: second quarter of 1997 and thereafter, reduction in the top rate and broadened wage brackets, increased standard deduction.

TAX13: third quarter of 2003 through fourth quarter of 2003.

Currently, the two alternative estimation procedures produce very similar results for the forecast period.

Non-withholding cash components are estimated using two alternative methods. The first method uses historical patterns of growth rates and examines the share of non-withholding liability to total liability normally provided by each component. This analysis is referred to as the ratio method. It is combined with our estimates of liability growth to derive growth rates for the non-withholding cash components. These rates are then applied to the most recent actual cash information to forecast the outyears.

Structural cash component model

The second method uses an econometric approach or "cash model" to estimate the non-withholding components of income tax collections. The models follow the approach of Harvey (1989)[4] and can be described as a structural time series model. The general form of each equation can be written as follows:

$$\text{Cash Component}_t = \mu_t + \beta_t + \delta_t * \text{Liability}_t + \text{Error}_t$$

The model is estimated using the Kalman filter approach described in summary in Proietti (2002)[5]. This model allows the trend to change in a smooth manner over time to reflect changes in the tax environment apart from changes that impact liability. Each cash component includes income tax liability or adjusted income tax liability (liability minus withholding plus refunds) as an independent variable. This has the advantage of capturing the impact of law changes on the cash components. In addition, by including liability, the models tie back to our outyear projections of liability based on the AGI components model. The model is estimated in log form covering the period from 1980-2001, using annual observations. The discrepancy and credit to estimated variables are essentially random processes in the cash table and, thus, in the estimation they are estimated without a liability term. For forecasting purposes, the equations are solved recursively. Refunds and vouchers are solved first so that adjusted liability can be calculated. The results for the major cash components of income tax receipts are summarized in the following tables.

ESTIMATED ELASTICITIES
(t - statistics in parenthesis)

Dependent Variable (Cash Component)	Independent Variables		
	PIT Liability	Adjusted PIT Liability	Withholding
Estimated Vouchers	1.36 (6.59)	–	–
Estimated Extensions	–	1.51 (8.48)	–
Final Payments	–	0.94 (9.87)	–
Refunds	-0.85 (-2.88)	–	1.51 (5.41)

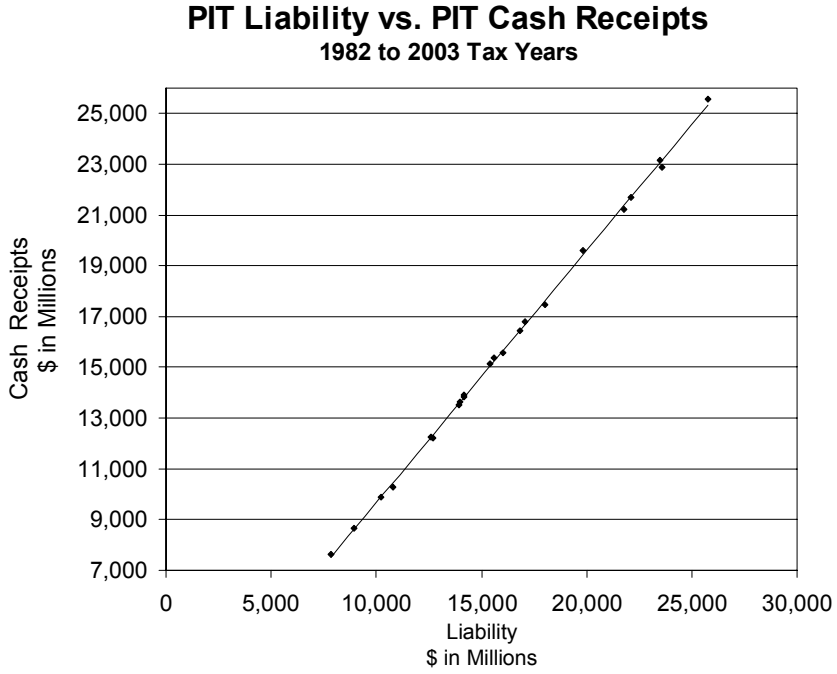
The elasticity for vouchers is larger than one, suggesting that this component is quite sensitive to changes in underlying liability. Both extensions and final payments are very significantly related to adjusted liability. The extension elasticity is above one as taxpayers with increasing liability from non-withheld sources seem likely to make large adjustments in their extension payments when adjusted liability changes. The final payment elasticity is about one, which is what we would expect — changes in adjusted liability are matched by

[4] Harvey, A.C. (1989), Forecasting, Structural Time Series and the Kalman Filter; Cambridge University Press.
[5] Proietti , Tommaso, (2002), Forecasting with Structural Time Series Models, in A Companion to Economic Forecasting, Blackwell.

proportional changes in payments. In the refunds model, withholding is an additional explanatory variable. The logic is that refunds and withholding tend to move together. As wages increase, a taxpayer's withholding increases and it is expected that, absent tax law changes and other behavioral changes, the value of refunds increases as well — the refund to withholding ratio should stay fairly constant over time correcting for law changes. The negative coefficient on the liability variable indicates that, holding withholding constant, an increase in tax liability will decrease refunds. The table of summary statistics reports measures of model fit and the Durbin-Watson test for serial correlation. The RD2 value is a measure of goodness of fit comparing predicted changes in the dependent variable to a random walk model. Overall, the models fit the data well and show no indication of significant autocorrelation.

SUMMARY STATISTICS

Dependent Variable (Cash Component)	R2	RD2	Durbin-Watson
Estimated Vouchers	.96	.72	1.3
Estimated Extensions	.93	.77	2.1
Final Payments	.90	.80	2.1
Refunds	.93	.53	1.7



While the ratio method was used to construct our estimates, the structural model is used as a check on the reasonableness of these results. Overall, both methods provide very similar estimates of cash collections by fiscal year. This reflects the fact that the sum of cash collections correlates very closely with overall liability. A significant source of estimation error arises from the difficulty in assigning the liability to the correct cash component in the appropriate fiscal year. In addition, forecast error results from the imprecision in our forecast of future tax liability.

RISKS TO LIABILITY FORECAST

The PIT liability forecast is subject to considerable risks. The national economy is still emerging from recession and therefore vulnerable to any significant shocks. Accelerating productivity has enabled firms to expand production without increasing payrolls. Consumer spending may also wane as the prior years' stimulus from tax cuts, home equity extraction, and interest rate cuts are spent. Additionally, the stock market and financial services industry may do much better or worse than envisioned.

The predominance of volatile income components (such as capital gains realizations, bonuses and stock incentive payouts) in AGI and the concentration of such income in the hands of a relatively small number of high-income taxpayers also pose enormous risks to the personal income tax forecast.

SALES AND USE TAX

BACKGROUND

Tax Base and Rate

New York State has imposed a general sales and use tax since 1965. It is currently the State's second largest tax revenue source at over $9 billion annually. The tax rate has been 4 percent since 1971 although a temporary surcharge to 4.25 percent was imposed from June 1, 2003, to May 31, 2005. Counties and cities within the State are authorized to impose an additional 3 percent sales and use tax, although many have temporary authorizations to impose at higher rates. The highest maximum combined State and local rate, including the 0.25 percent Metropolitan Commuter Transportation District tax, is 8.75 percent.

The tax applies to sales and uses within the State of tangible personal property (unless specifically exempt), certain utility service billings, restaurant meals, hotel and motel occupancy, and specified services and admission charges. Certain exemptions such as food, prescription drugs, residential energy, and college textbooks have been enacted to lessen the regressiveness of the tax. Other items including machinery and equipment used in production and property purchased for resale, are excluded from tax to avoid tax pyramiding.

Administration

Persons selling taxable property or services are required to register with the Department of Taxation and Finance as sales tax vendors. Vendors generally are required to remit the tax that they have collected quarterly. However, vendors who record more than $300,000 of taxable sales in any of the immediately preceding four quarters must remit the tax monthly, by the twentieth of the month following the month of collection. Vendors collecting less than $3,000 yearly may elect to file annually, in March. Finally, monthly filers collecting more than $500,000 in tax annually are required to remit the tax by electronic funds transfer (EFT). This means that collections for the first 22 days of the month must be remitted electronically within three business days after the twenty second.

DATA SOURCES

The primary sources of data used in the estimation and forecasting methodology for the sales tax are as follows:

- *RS-43*, Department of Taxation and Finance Monthly Report of Receipts. This report contains gross and net receipts data.
- *Various reports, Department of Taxation and Finance.* Other reports supplementing the RS-43 provide information on data such as audit collections, prior period adjustments and daily receipts.
- *Various U.S. and New York government agencies, including the U.S. Bureau of Economic Analysis of the Commerce Department.* These agencies provide economic data used in the econometric equations.

STATUTORY CHANGES

The Division of the Budget has developed a series of State fiscal year sales and use tax receipts that has been adjusted for Tax Law, administrative and other changes to allow for year-to-year comparisons of the taxable sales base.

Major legislative and administrative events causing divergent growth in actual sales tax receipts from the constant law series include:

- large taxable base expansion in 1991-92;
- one-time spin-up due to the implementation of EFT in 1992;
- exceptional audit collections in 1994-95;
- implementation of vendor credit program in 1995-96;
- week-long exemptions for clothing and footwear biannually from 1997-98 to 1999-2000;
- exemption for promotional materials in 1997-98;
- exemption for college textbooks in 1998-99;
- expansion of the vendor s credit in 1999-2000;
- permanent exemption for clothing and footwear priced under $110 beginning March 1, 2000;
- lower tax rate on charges for separately purchased transmission and distribution of electricity and gas in 2000-01;
- rate surcharge from 4 percent to 4.25 percent effective June 1, 2003 to May 31, 2005; and
- replacement of permanent clothing exemption with two temporary weeks at a threshold of $110 per item between June 1, 2003, and May 31, 2004.

FORECAST METHODOLOGY

Cash collections are reduced by credits and increased by collections from audits and other administrative processes, which, due to payment schedules, are unrelated to economic liability in the month remitted. To adjust the sales tax series to more closely correspond to the economic activity that generated the receipts, collections from the first ten days of the quarter are placed in the previous quarter, non-voluntary collections (audit collections, tax compliance) are removed from the series, the March prepayment (now repealed — applied to March 1976 through March 1990 only) is placed in April, and an adjustment is made for allocation errors made in prior periods.

Econometric Techniques

To generate a sales tax forecast, the Division of the Budget first estimates three single-equation econometric models, each representing a somewhat different approach to estimating the relationship between quarterly economic data and underlying sales tax collections. The year-over-year growth rates from each of the three equations are equally weighted to obtain a single growth rate forecast of the taxable sales base.

Consumption Equation

Two taxable consumption variables are used to explain the nominal level of collections in the regression equation.

Dependent Variable

- Adjusted Quarterly Collections. (See above.)

Consumption of Taxable Goods in New York

- Ratio of New York employment to U.S. employment multiplied by U.S. consumption of durable and non-durable goods that are taxable in New York.

Consumption of Taxable Services in New York

- Ratio of New York employment to U.S. employment multiplied by U.S. consumption of services that are taxable in New York.

Clothing Exemption Dummy

- Effective March 1, 2000, items of clothing and shoes costing less then $110 are exempt from the sales and use tax. The dummy variable is 0.33 for the first quarter of 2000, and 1.0 thereafter.

The National Income and Product Accounts data are used to distinguish between taxable and non-taxable goods and services. The ratio of New York employment to U.S. employment is included to share the national variables to produce an estimate of New York State's taxable consumption. Seasonal dummy variables are also used, since the sales tax base exhibits seasonal behavior with the school and Christmas shopping seasons being the busiest seasons.

The estimated equation takes the following form. The seasonal dummies are denoted by an "S."

CONSUMPTION EQUATION

$$\text{Adjusted Quarterly Collections}_t = \underset{(0.32)}{-28{,}391} + \underset{(3.71)}{9.8} * \text{Consumption of Taxable Goods}_t + \underset{(3.08)}{25.192} * \text{Consumption of Taxable Services}_t - \underset{(-6.67)}{50{,}034} * \text{S Quarter 1}_t - \underset{(-3.14)}{27{,}128} * \text{S Quarter 2}_t + \underset{(4.80)}{36{,}497} * \text{S Quarter 3}_t - \underset{(-5.14)}{173{,}739} * (\text{Clothing Dummy}_t)$$

R-Bar Squared	0.993
Durbin-Watson Statistic	2.2
Standard Error of the Regression	$27.5 million
Number of Observations	87

PERCENT CHANGE IN EXOGENOUS VARIABLES — STATE FISCAL YEARS 1993-94 TO 2003-04

	93-94	94-95	95-96	96-97	97-98	98-99	99-00	00-01	01-02	02-03	03-04 Estimated
Taxable consumption of goods in NY as shared by employment ratio	4.3	3.8	2.4	4.0	3.4	5.8	8.4	6.7	2.5	3.5	5.9
Taxable consumption of services in NY as shared by employment ratio	4.9	5.9	5.0	6.3	7.2	6.7	6.4	5.5	1.5	2.7	2.9

Dynamic Adjustment Income and Employment Equation

Equation 2 uses disposable income, employment and a term that allows for gradual dynamic adjustment in the relationship between income, employment and sales tax collections. Two exogenous variables, an error correction term (see Davidson, Hendry, et al.) and a dummy for the permanent clothing exemption are used to explain the nominal level of collections in the regression equation. All variables (excluding the dummy) are expressed in terms of the difference from the same quarter in the prior year to eliminate the need for seasonal dummies. Finally, a term representing lagged values of the dependent variable is employed to eliminate serial correlation.

USER TAXES AND FEES

Dependent Variable

- The logarithm of adjusted quarterly collections minus the logarithm of prior year (same quarter) collections.

Employment

- The logarithm of current-quarter New York employment numbers minus the logarithm of prior year (same quarter) New York employment.

Error Correction Term

- The estimated long-run equilibrium relationship between adjusted collections and employment and disposable income. The theory is that consumers make corrections in the current quarter for any over or under spending four quarters ago and move towards the long-run equilibrium result.

Lagged Dependent Variable

- The logarithm of adjusted New York sales tax collections lagged one quarter minus the logarithm of New York sales tax collections lagged five quarters.

Clothing Exemption Dummy

- Effective March 1, 2000, items of clothing and shoes costing less than $110 are exempt from the sales and use tax. The dummy variable is 0.33 for the first quarter of 2000, and 1.0 thereafter.

The form of the estimated equation is as follows with all variables (except the dummy) expressed in logs.

DYNAMIC ADJUSTMENT INCOME AND EMPLOYMENT

$$\text{Adjusted Quarterly Coll.}_t - \text{Adjusted Quarterly Coll}_{t-4} = \underset{(0.77)}{0.005} + \underset{(6.74)}{1.353} * (\text{Employment}_t - \text{Employment}_{t-4})$$

$$- \underset{(-5.64)}{0.36} * (\text{Adjusted Quarterly Coll.}_{t-4} - \underset{(-48.7)}{1.138} * \text{Employment}_{t-4} - \underset{(-20.65)}{0.683} * \text{Disposable Income}_{t-4}) +$$

$$\underset{(1.31)}{0.124} * (\text{Adjusted Quarterly Coll.}_{t-1} - \text{Adjusted Quarterly Coll.}_{t-5}) - \underset{(-3.5)}{0.02501} (\text{Clothing Dummy}_t)$$

R-Bar Squared	0.6763
Durbin-Watson Statistic	2.133
Standard Error of the Regression	$35.5 million
Number of Observations	87

PERCENT CHANGE IN EXOGENOUS VARIABLES STATE FISCAL YEARS 1992-93 TO 2002-03

	93-94	94-95	95-96	96-97	97-98	98-99	99-00	00-01	01-02	02-03	03-04 Estimated
NY Disposable Income	2.1	4.0	4.4	414	4.0	5.7	3.3	8.1	2.1	5.0	5.1
NY Employment	0.4	1.1	0.2	1.0	1.7	2.5	2.3	1.9	(1.6)	(1.2)	(0.2)

Auto Sales and Retail Trade Employment Equation

The final equation uses two measures of employment and the value of new automobiles and trucks to explain sales tax collections.

Dependent Variable
- The logarithm of current-quarter adjusted sales tax collections.

Nominal Value of Registered Autos and Light Trucks
- The logarithm of New York new auto and light truck registrations multiplied by the national average price of a new car. Non-seasonally adjusted.

Non-Trade Private Employment
- The logarithm of New York private non-trade employment multiplied by a measure of New York consumer price inflation. This is used as a proxy for business purchases. Trade employment is excluded to minimize multicollinearity. The consumer price index is included to create a nominal concept.

Retail Trade Employment
- Expressed in the same manner as non-trade private employment above. This variable attempts to capture all other retail activity excluded by the other exogenous variables.

Dummy Variable
- The "Value of Newly Registered Autos and Trucks" variable increases significantly after the first quarter of 1993, due to the inclusion of light trucks in the data series after that date. A dummy variable is required to account for this change. The dummy variable is zero prior to and including the first quarter of 1993, and one thereafter.

All variables except the price deflator are non-seasonally adjusted. The form of the estimated equation is as follows.

AUTO SALES AND RETAIL TRADE EMPLOYMENT

(3) Adjusted Quarterly Coll.$_t$ = 5.19 + 0.083 * Value of Newly Registered Autos and Trucks$_t$
(17.6) (5.03)

+ 0.245 * Non-Trade Private Employment$_t$ + 0.788 * Retail Trade Employment$_t$
(1.98) (6.64)

- 0.027 * Dummy$_t$
(-2.21)

R-Bar Squared	0.9905
Durbin-Watson Statistic	1.807
Standard Error of the Regression*	$36.9 million
Number of Observations	87

* Normalized.

PERCENT CHANGE IN EXOGENOUS VARIABLES — STATE FISCAL YEARS 1992-93 TO 2002-03

	93-94	94-95	95-96	96-97	97-98	98-99	99-00	00-01	01-02	02-03	03-04 Estimated
Nominal Value of Registered Autos and Light Trucks*	35.6	16.3	(0.6)	12.1	3.5	14.2	12.6	(5.2)	8.2	5.0	10.5
Non-trade Private Employment	3.4	3.9	3.5	4.4	4.2	4.2	2.5	2.2	(1.9)	(1.7)	(0.2)
Retail Trade Employment	2.8	4.2	4.1	3.8	2.9	3.1	2.9	1.9	(2.2)	(0.6)	0.2

* Beginning in the second calendar quarter of 1993, this variable includes light truck registrations. This partially accounts for the large growth rate noted for this variable in 1993-94.

Elasticities

Elasticities have been calculated for the exogenous variables in equation 1. Elasticity is a measure which reports the percentage change in a variable given a 1 percent change in another variable. For example, a 1 percent change in the real price of a commodity may result in a 0.5 percent change in the consumption of that commodity. So the price elasticity of demand (consumption) would be 0.5. The elasticities reported here were calculated by taking the average of endogenous and exogenous variables over the last five years. Then the average percent change in the endogenous variable resulting from a one percent change in exogenous variable was calculated. The stated elasticities for equation 2 are cointegrating coefficients, which represent long-run equilibrium relationships. Equation 3 is estimated in natural log terms. Therefore, the coefficients on the variables may be interpreted as elasticities.

ELASTICITY OF EXOGENOUS VARIABLES IN REGRESSION EQUATIONS

	Elasticity
Equation 1	
Taxable consumption of goods in New York	.90
Taxable consumption of services in New York	.19
Equation 2	
New York employment	1.14
New York Disposable Income	0.68
Equation 3	
Nominal value of registered autos and light trucks in New York	.08
New York non-trade private employment	.25
New York retail trade employment	.79

Adjustments

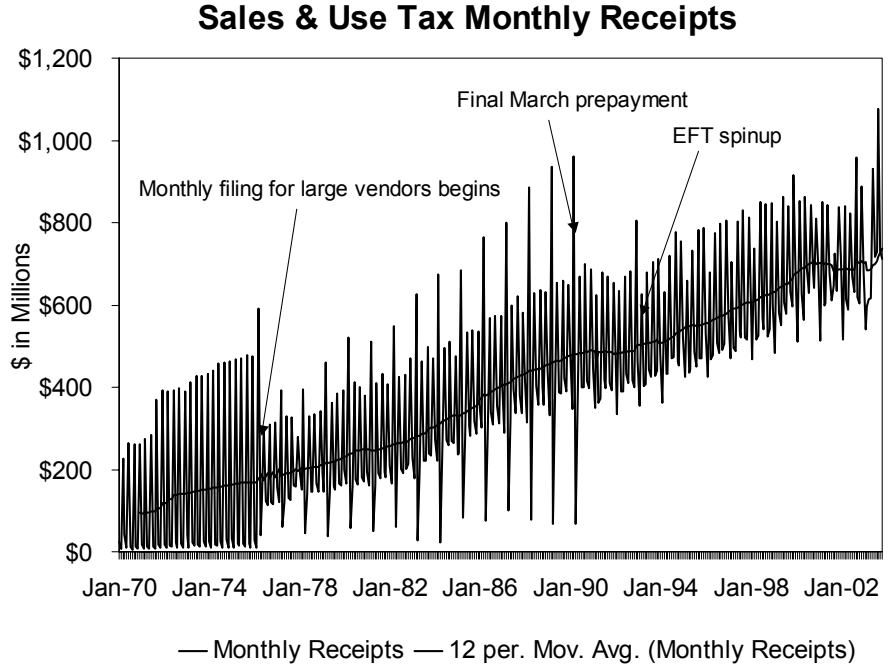
Once the Budget forecast of the relevant economic variables is used to produce an estimate of growth in base receipts, this growth rate is applied to a prior-year sales tax receipt base that has been adjusted for Tax Law and other changes to yield a raw current-year forecast. Then this is converted into a cash forecast by accounting for factors including Tax Law and administrative changes, audits, court decisions and prior-period adjustments.

It should be noted that the base growth forecasts produced by taking the average of the three estimates of the taxable sales base generated by the equations do not necessarily match the concept of growth in the continuing sales tax base in periods for which actual sales tax collections data are available. The models take no account of the value of tax cuts or other administrative changes that impact sales tax collections. Adjusting actual data, where available, for such impacts yields the continuing sales tax base concept that makes year-to-year comparisons more accurate.

Cash Receipts

PERCENTAGE DISTRIBUTION OF CASH RECEIPTS

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
1995-96	24.1	25.7	25.8	24.5
1996-97	24.4	25.3	25.5	24.8
1997-98	24.5	25.8	25.3	24.4
1998-99	24.8	25.6	25.0	24.6
1999-2000	24.3	24.7	26.1	25.0
2000-01	24.4	25.7	25.4	24.5
2001-02	24.7	23.5	26.7	25.1
2002-03	23.9	26.6	24.8	24.7
2003-04 (est.)	22.4	26.5	26.8	24.3



Risks to the Forecast

Errors in the forecasts of the exogenous variables provide a degree of risk to the sales and use tax forecast. Forecast error in prior years can largely be attributed to the forecasts of the exogenous variables. Variation in the estimate may also occur as a result of administrative changes or unanticipated legislative action.

CIGARETTE AND TOBACCO TAXES

BACKGROUND

Tax Base and Rate

Legislation passed with the Health Care Reform Act of 2000 increased the tax on the sale or use of cigarettes within the State by 55 cents to $1.11 per pack on March 1, 2000. Legislation enacted in 2002 raised the tax rate to $1.50 per pack beginning on April 3, 2002. The tax on tobacco products increased from 20 percent to 37 percent of their wholesale price on July 2, 2002. Prior to June 1, 1993, the cigarette tax was 39 cents per pack and the tobacco products tax was 15 percent of their wholesale price.

The Federal government imposes a cigarette excise tax on manufacturers and first importers of cigarettes. The Federal tax rate, currently 39 cents per pack, was increased from 24 to 34 cents per pack on January 1, 2000, and increased again to 39 cents per pack on January 1, 2002. New York City also levies a separate cigarette excise tax, which increased from 8 cents to $1.50 per pack on July 2, 2002. The Federal government also imposes an excise tax on manufacturers and importers of tobacco products at various rates, depending on the type of product.

Sales on qualified Native American reservations to Native Americans are exempt from tax along with sales to State and national governmental entities, the Armed Forces, the United Nations and diplomatic personnel.

Administration

State registered stamping agents, most of who are wholesalers, purchase tax stamps from the State and affix the stamps to cigarette packages to be sold by New York State registered retailers. Purchasers of non-State stamped cigarettes, such as cigarettes sold out-of-State or on Indian reservations, must remit the cigarette excise tax directly to the Department of Taxation and Finance. Purchases of two cartons or less incur no use tax liability; however, purchases exceeding two cartons incur use tax liability on all cartons purchased.

DATA SOURCES

The primary sources of data used in the estimation and forecasting of the cigarette and tobacco tax are as follows:

- *RS-43, Department of Taxation and Finance Monthly Report of Receipts.* This report contains gross and net receipts data for each component of the cigarette and tobacco products tax.
- *New York State Department of Taxation and Finance Monthly and Fiscal Year Comparison of Cigarette Tax Collections.* This report includes the number of stamps sold, assessments and agents' commission.
- *The Tax Burden on Tobacco.* This annual data publication, previously published by the now-defunct Tobacco Institute, is produced by the economic consulting firm Orzechowski and Walker. It is the source of the consumption and cigarette price data used in the cigarette consumption forecasting equation.
- *Various U.S. and New York government agencies*, provide the Consumer Price Index and population data used in the cigarette consumption equation.
- *United States Department of Agriculture Economic Research Service, Tobacco Situation and Outlook Report.* Published semi-annually. Used for national cigarette and tobacco products information.

STATUTORY CHANGES

Tax rate changes have had the most significant impact on cigarette tax revenues. As shown in the accompanying graph, revenues spiked in the months following tax rate increases in 1972, 1983, 1989, 1990 and 1993, 2000, and 2002 before slowing in the subsequent months. Total tax-paid cigarette consumption in New York has declined significantly since the mid-1980's. This is largely due to steady price increases, awareness of the adverse health consequences of smoking, smoking restrictions, anti-smoking programs, tax-free purchases on Indian reservations, tax rates in surrounding states, and bootlegging. However, the decline in consumption has also been impacted by events including State, New York City and Federal cigarette tax increases, substantial enforcement efforts and the Tobacco Settlement.

Major recent events impacting overall taxable consumption include:

- Increase in the New York City cigarette excise tax from 8 cents per pack to $1.50 per pack effective July 2, 2002.
- Increase in the State cigarette tax from $1.11 per pack to $1.50 per pack, effective April 3, 2002.
- Increase in the State cigarette tax from 56 cents per pack to $1.11 per pack, effective March 1, 2000.
- Additional 18 cents per pack price increase and full-year impact of the 45 cents per pack price increase in 1999-2000, due primarily to the cost of the Tobacco Settlement on the industry.
- Ten cent Federal excise tax increase, resulting in a 13 cent wholesale price increase in the last quarter of State fiscal year 1999-2000.
- Doubling of New Jersey's cigarette excise tax and part-year impact of a 45 cent price increase resulting from the Tobacco Settlement in 1998-99.
- State enforcement program enacted in 1997-98.

Receipts, since the latter half of 1998-99, have been significantly impacted by cigarette price increases imposed by the manufacturers following the finalization of the Tobacco Master Settlement Agreement in November 1998. Since the Tobacco Settlement was signed in November 1998, the producer price index (which does not include taxes) for cigarettes has increased 69 percent as tobacco companies have attempted to recoup both normal increases in operating costs and the cost of the settlement through price increases.

FORECAST METHODOLOGY

Econometric Model

TAXABLE CIGARETTE CONSUMPTION

$$\text{Per Capita Consumption}_t = \underset{(23.3)}{7.56} - \underset{(-8.2)}{0.024} * \text{Time Trend}_t - \underset{(-5.75)}{.41} * \text{Real Price of Cigarettes} + u_t$$

$$u_t = \underset{(-7.41)}{-.819} * u_{t-1}$$

R-Bar Squared	0.9928
Durbin-Watson Statistic	1.46
Standard Error of the Regression*	3.4 packs
Number of Observations	32

* Normalized.

The Division of the Budget has developed an econometric model to assist in forecasting State taxable cigarette consumption. A time trend and the real price of cigarettes are the exogenous variables used to explain consumption per capita of taxed cigarettes in New York. The price variable is the average annual price, including tax, of cigarettes in New York. This is indexed to 1982-84 and divided by the Consumer Price Index to measure the price of cigarettes relative to the overall prevailing price level. An exogenous variable measuring the price of cigarettes in New York relative to surrounding states was attempted, but the results were not as satisfactory as the model noted above. Specifically, the added variable was insignificant when used with the stand-alone price, and the fit was inferior when it was used alone. As an alternative to autocorrelation correction, a lagged dependent variable was added, but the results were inferior to the method noted above

The estimated price elasticity of the per capita consumption of cigarettes is -0.41 percent. This estimate is within the range of -0.3 percent to -0.5 percent typically noted in the economics literature[1]. The trend decline in cigarette consumption, holding prices constant is estimated at 2.4 percent per year. In other words, holding the real price of cigarettes constant, consumption per capita has declined on average 2.4 percent per year.

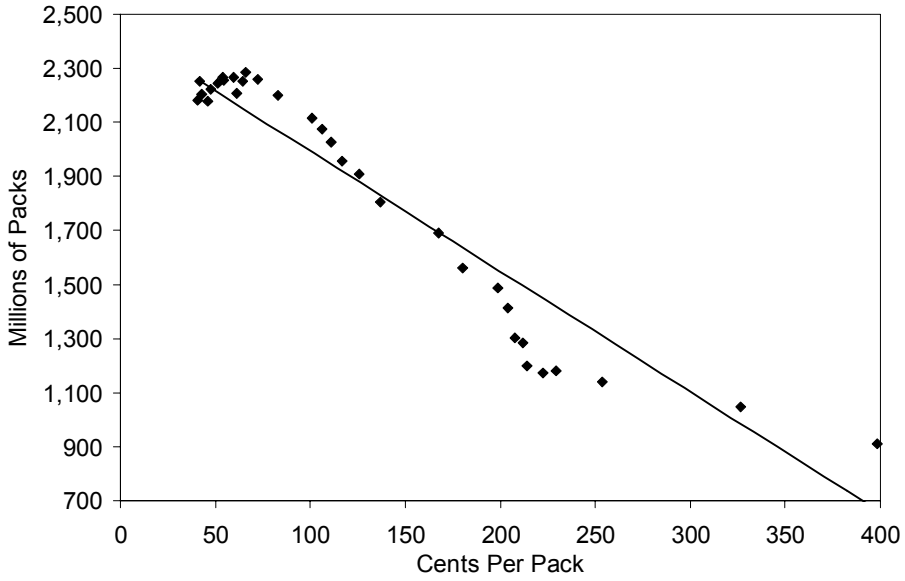
To produce an updated cigarette tax forecast, the results of the equation are supplemented with the estimated impact of discrete events on cigarette tax revenues, such as large price increases by manufacturers, Federal and State cigarette excise tax increases and enforcement efforts. Prices increased 5.5 percent in 2001-02 and 14.4 percent in 2002-03.

To illustrate, consider tax receipts for State fiscal year 2000-01. In addition to the expectation of continuing declines in consumption from manufacturer's price increases and the growing aversion to smoking for health reasons, receipts in 2000-01 were impacted by the near doubling of the State excise tax on March 1, 2000. Such a large effective price increase will have a negative impact on cigarette consumption beyond the price effect noted above. As the price of cigarettes was high in New York relative to each of the surrounding states, there was a significant incentive for bootlegging cigarettes into the State. Legal

[1] See, for example, W. Evans, J. Ringel, and D. Stech, *Tobacco Taxes and Public Policy to Discourage Smoking*, Tax Policy & the Economy, 1999, Issue 13.

avoidance of the tax also undoubtedly proliferated in the form of out-of-State purchases and tax-free sales on Indian reservations. Finally, legislation has been enacted to prohibit all purchases of cigarettes via mail-order or via the Internet. This law became effective March 1, 2003. It does not apply to the U.S. Postal Service. Receipts in 2000-01 were also impacted by the ten cent Federal excise tax increase that began January 1, 2000. However, this had a less severe impact on New York cigarette tax receipts as this tax increase was nationwide, and therefore did not exacerbate price differentials between New York and surrounding states or Indian reservations that may be exploited by illegal activities or legal avoidance.

N.Y. Tax-Paid Cigarette Consumption and Price

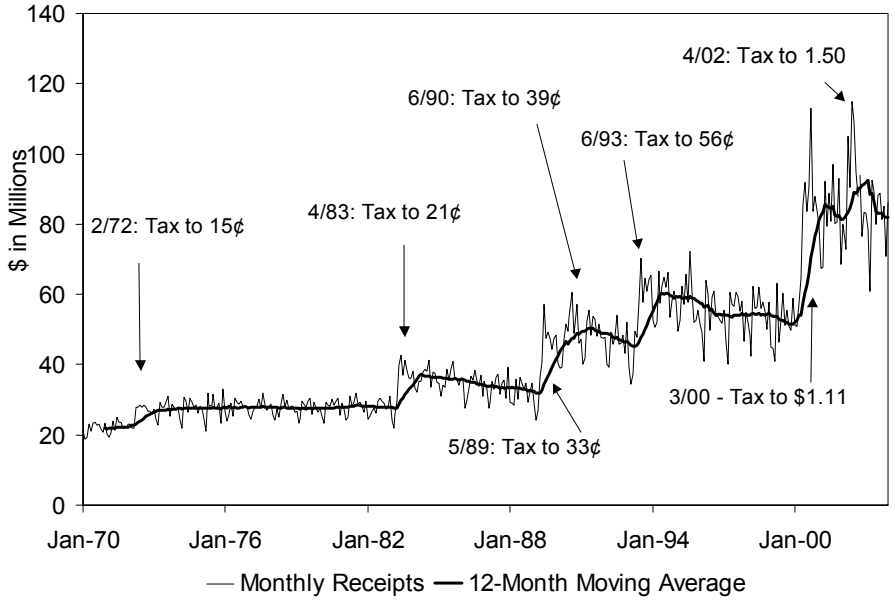


Data represents 1970-2002

CIGARETTE TAX RATES AND TAXABLE CONSUMPTION
CHANGES IN NEW YORK AND BORDERING STATES
YEAR ENDING JUNE 30
(average cents per pack)

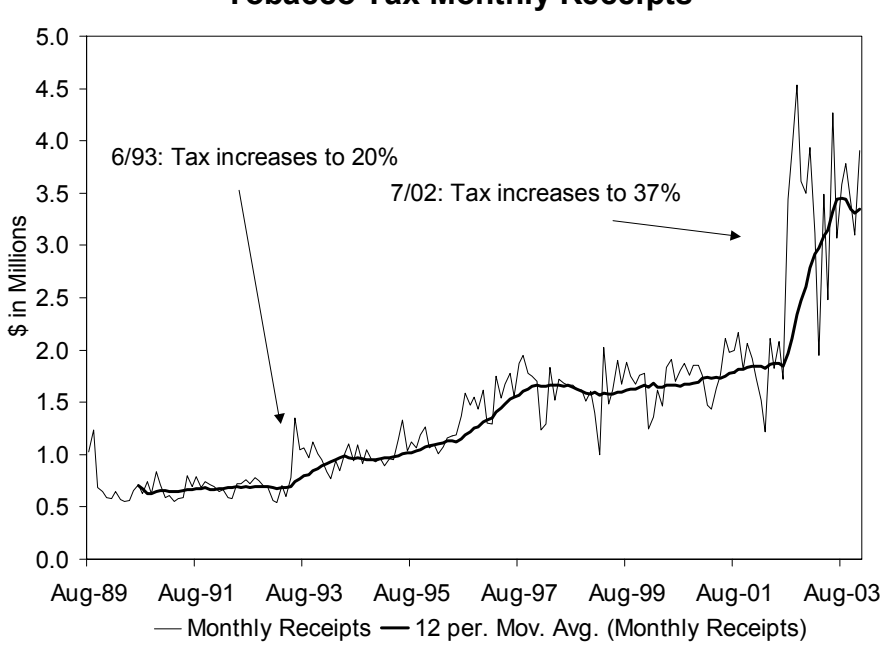
	2002	2001	2000	1999	1998
Connecticut	50	50	50	50	50
(percent change)	(0.2)	(0.2)	(2.3)	(2.9)	(0.5)
Massachusetts	76	76	76	76	76
(percent change)	(2.8)	(2.8)	(2.3)	(4.6)	(4.7)
New Jersey	80	80	80	80	60
(percent change)	(1.1)	(1.1)	(4.0)	(11.8)	(5.7)
New York	1.11	1.11	74	56	56
(percent change)	(13.2)	(13.2)	(8.1)	(3.3)	0.6
Pennsylvania	31	31	31	31	31
(percent change)	(0.7)	(2.1)	(1.4)	(0.8)	(0.5)
Vermont	44	44	44	44	44
(percent change)	4.7	(1.1)	(3.0)	(0.7)	(3.7)

Cigarette Tax Monthly Receipts



Tobacco Products Tax Forecast Development

Tobacco products tax receipts are a much smaller component of the cigarette and tobacco tax. In 2002-03, tobacco tax receipts of $37.6 million accounted for only 3.4 percent of total cigarette and tobacco tax collections. This tax includes products such as cigars, pipe tobacco and chewing tobacco. The Division of the Budget uses trend analysis as well as data published by the United States Department of Agriculture[2] to construct a tobacco products tax forecast. The following graph shows tobacco monthly and the 12-month moving average collections from August 1989 to December 2003.



PERCENTAGE DISTRIBUTION OF CASH RECEIPTS

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
1995-96	27.3	28.0	23.7	21.0
1996-97	26.7	26.8	24.5	22.0
1997-98	26.7	26.9	24.5	21.9
1998-99	27.1	27.2	25.3	20.4
1999-2000	25.0	25.9	24.7	24.5
2000-01	24.2	28.7	25.6	21.5
2001-02	26.3	26.1	24.6	23.0
2002-03	28.4	27.2	23.7	20.7
2003-04 (est.)	26.8	26.6	25.0	21.6

Risks to the Forecast

Several factors impart a substantial amount of uncertainty to the cigarette tax forecast. First, according to Securities and Exchange Commission (SEC) filings by Philip Morris, Inc., as of August 2002 there were hundreds of pending tobacco-related legal claims, including individual personal injury lawsuits, class action lawsuits and health care cost recovery lawsuits. In July 2000, a Florida jury in the Engle case awarded $145 billion in punitive

[2] United States Department of Agriculture Economic Research Service, *Tobacco Situation and Outlook Report*, Washington D.C. (This publication is available on the Internet at http://www.econ.ag.gov/briefing/tobacco/index.htm)

damages. Furthermore, there is action being pursued by the United States Justice Department against the cigarette manufacturers in an attempt to recover billions of dollars of health care costs. If ultimately successful, such litigation would likely cause another round of large wholesale price increases by the cigarette manufacturers. Such unanticipated price increases would decrease State and national taxable consumption.

Additional uncertainty originates from the effectiveness of new anti-smoking campaigns. As part of the Tobacco Master Settlement, participating cigarette manufacturers agreed to place limitations on advertising, sporting event sponsorship and "branded" merchandise, as well as contribute $1.5 billion over ten years to support anti-smoking programs. Also, the Health Care Reform Act of 2000 designates moneys to fund anti-smoking campaigns in New York State. Furthermore, legislation signed by the Governor in August 2000 will require all cigarettes sold in New York to meet certain fire safety standards effective July 2004. If these requirements result in price increases or if smokers find the new product inferior, taxable consumption in New York could decline further.

MOTOR FUEL TAX

BACKGROUND

Tax Base and Rate

An 8 cent per gallon tax is imposed on the sale of gasoline and diesel motor fuel in the State. Prior to January 1, 1996, the diesel motor fuel tax was 10 cents per gallon. Non-highway uses of motor fuel, such as in construction machinery, agriculture, commercial marine activity, or vehicles operated on rails or tracks, are granted refunds of the tax. Thus, the tax is levied primarily on persons who operate motor vehicles on the public highways of the State or operate recreational boats on the State's waterways.

Beginning in State fiscal year 2001-02, all motor fuel tax revenue was earmarked for deposit in the Dedicated Highway and Bridge Trust Fund, the Dedicated Mass Transportation Trust Fund, and the Emergency Highway Funds. In 2003-04, all motor fuel tax receipts are earmarked to the Dedicated Highway and Bridge Trust Fund and the Dedicated Mass Transportation Trust Fund.

Administration

The gasoline component of the motor fuel tax is collected and remitted upon first import for sale, use, storage or distribution in New York State. The diesel motor fuel tax is collected on the first non-exempt sale in the State.

The tax is generally remitted monthly, although vendors whose average monthly tax is less than $200 may remit quarterly. Vendors with annual tax liability of more than $5 million for both the motor fuel tax and the petroleum business tax during the preceding year must remit the tax via electronic funds transfer (EFT) by the third business day following the 22nd of each month.

DATA SOURCES

The primary sources of data used in the estimation and forecasting for the motor fuel tax are as follows:

- *RS-43, Department of Taxation and Finance Monthly Report of Receipts.* This report contains gross and net receipts data for gasoline and diesel motor fuel tax receipts.
- *United States Energy Information Administration.* Various publications, including the Short Term Energy Outlook, Petroleum Marketing Monthly and Annual Energy and Motor Gasoline Watch, contain useful information. Available on the Internet at http://www.eia.doe.gov.
- *Various U.S. and New York government agencies, including the U.S. Bureau of Economic Analysis of the Commerce Department.* These agencies provide economic data used to develop gasoline and diesel consumption forecasts.

STATUTORY CHANGES

The only significant law change in recent years has been the reduction in the diesel motor fuel tax from 10 cents per gallon to 8 cents per gallon, effective January 1, 1996.

FORECAST METHODOLOGY

Econometric Techniques

Generating the motor fuel revenue forecast is a two-step process. First, a forecast of demand (gallons) is produced at an annual (fiscal year) frequency and the appropriate tax rate is applied. Second, various adjustments are made to arrive at the forecast of cash collections, since a direct relationship does not exist between demand and cash collections. Both of these steps are discussed below.

Gallonage

Both of the following equations are explicitly shown in the petroleum business tax (PBT) methodology.

Gasoline

- The Energy Information Administration (EIA) has reported estimated relationships between changes in real gross domestic product (GDP), national fuel prices and national gasoline demand. They estimate that a 1 percent increase in GDP will raise gasoline demand by 0.1 percent, and a 10 percent increase in fuel prices will decrease demand by 0.3 percent. To derive a State level forecast, real New York disposable personal income growth is substituted for GDP. The following table contains percentage changes of real New York disposable personal income and gasoline price.

PERCENT CHANGE IN EXOGENOUS VARIABLES

	Real NY Disposable Income	Gasoline Price
1995-96	2.1	0.6
1996-97	1.9	7.8
1997-98	2.4	(5.0)
1998-99	4.2	(12.4)
1999-2000	0.9	21.7
2000-01	4.1	18.6
2001-02	(0.1)	(9.3)
2002-03	3.0	5.7
2003-04 (est.)	3.1	8.2

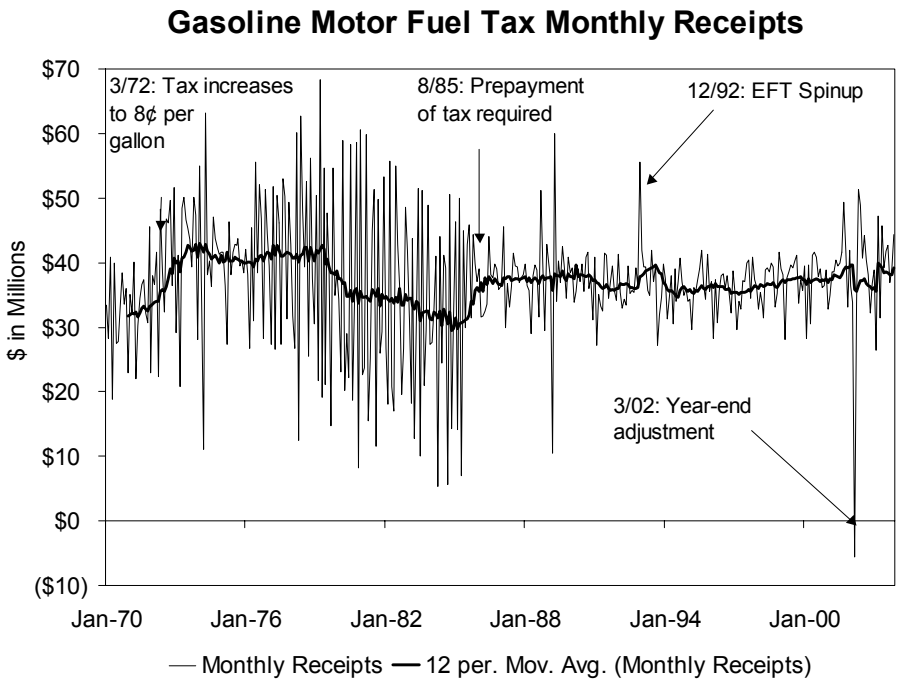
Diesel

- Consumption of diesel fuel is forecasted with a simple econometric model relating consumption to a broad measure of New York economic activity (real New York disposable personal income). The model was most recently estimated with 115 observations of quarterly data (1975:1 to 2003:3). A dummy variable is used to isolate the impact of changes in tax remittance in State fiscal year 1988-89. A quarterly dummy variable is also used to reflect quarterly consumption patterns.

Adjustments

After generating a demand forecast and applying the appropriate tax rates, adjustments are made for refunds, audits, credits, pay schedule lags, accounting delays, historical and year-to-date collection patterns, tax law changes, tax evasion and Federal and State enforcement measures.

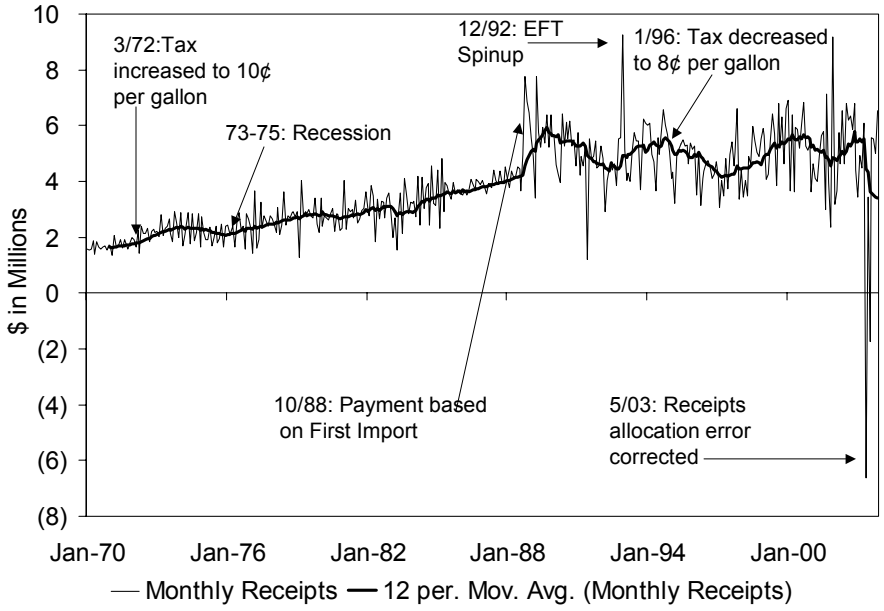
Cash Receipts



The Gasoline Motor Fuel Tax Monthly Receipts graph shows that gasoline motor fuel tax receipts display wide variation in monthly cash receipts, but the 12-month moving average has remained fairly stable since the mid-1980's, generally falling in the range of $35 million to $40 million per month.

The Diesel Motor Fuel Tax Monthly Receipts graph shows that diesel receipts have also remained fairly stable, usually falling between $4 million and $6 million per month since 1988.

Diesel Motor Fuel Tax Monthly Receipts



PERCENTAGE DISTRIBUTION OF CASH RECEIPTS

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
1995-96	24.8	26.7	25.2	23.3
1996-97	24.6	26.7	25.3	23.4
1997-98	24.2	26.4	26.3	23.1
1998-99	24.4	26.7	25.1	23.7
1999-2000	25.7	26.3	24.0	24.0
2000-01	25.2	26.6	24.9	23.3
2001-02	27.2	30.0	27.0	15.8
2002-03	27.5	26.6	22.8	23.1
2003-04 (est.)	23.3	25.6	26.6	24.5

Risks to the Forecast

Due to the difficulty in predicting fuel prices, gasoline inventories, tax evasion and weather conditions, the revenue estimate has certain inherent risks. Global economic and political conditions as well as market forces can affect fuel prices. For example, the West Texas intermediate crude oil price increased from $11 per barrel in December 1998 to over $34 per barrel by June 2000. The war in Iraq adds a degree of uncertainty to the future price of oil.

MOTOR VEHICLE FEES

BACKGROUND

Motor vehicle fees are imposed by the Vehicle and Traffic Law. An early version, enacted in 1929, was itself derived from other laws pertaining to traffic, such as the General Highway Traffic Law. The latest codification, which with subsequent amendments remains current, was enacted in 1959 and became effective in October 1960.

Tax Base and Rate

Motor vehicle fees are derived from a variety of sources, but consist mainly of vehicle registration and driver licensing fees.

Most vehicle registration fees are based on vehicle weight; buses are charged according to seating capacity and semi-trailers are charged a flat fee. Registration for vehicles weighing less than 18,000 pounds is biennial.

Drivers' licenses are originally issued for five years and renewals for eight-year periods. Basic renewal rates, per annum, are $5 for an operator's license, $10 for a chauffeurs' license, and $15 for a commercial driver's license.

Numerous other fees, related to the processes of registration or licensing, are another component of motor vehicle fees. Such fees pertain to inspection and emission stickers, repair shop certificates, insurance civil penalties, etc.

Administration

Registration and licensing take place at the central and district offices of the Department of Motor Vehicles and by mail and at county clerks' offices in most counties.

DATA SOURCES

The primary source of data is Preliminary Motor Vehicle Transactions, Department of Motor Vehicles. This report contains monthly data on item volume and dollar receipts. The table below illustrates quarterly cash flow for Motor Vehicle Fees on an all fund basis.

STATUTORY CHANGES

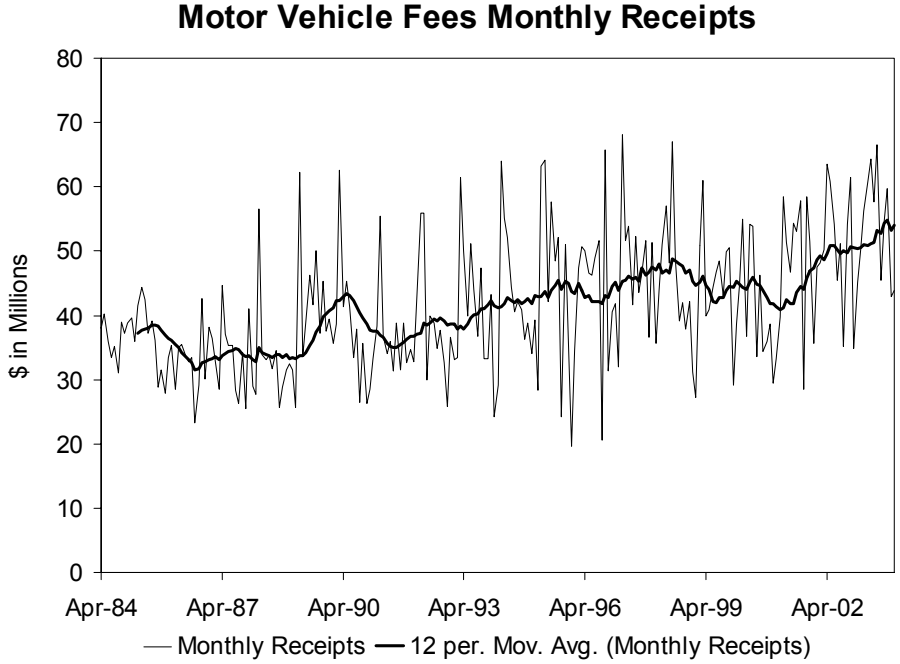
The main statutory or administrative changes that have a bearing on actual cash receipts include:

- Extension of license renewal period from four to five years (1996-97);
- Change in method and rate for paying county clerks (1996-97);
- Extension of validity of original licenses from four to five years (1997-98);
- Increase in the photo image fee (1997-98);
- Reduction of 25 percent in graduated rates on passenger cars (1998-99);
- Extension of license renewal period from five to eight years (2000-01); and
- Re-issuance of license plates (2000-01 through 2002-03).

FORECAST METHODOLOGY

Because the preponderant part of motor vehicle fees comes from registrations (70 percent) and licenses (20 percent), most attention is paid to the following variables:

- The number of passenger and commercial vehicles and the average weight of each type;
- The number of new and renewal licenses; and
- The cyclical pattern of registration, licensing, and renewal.



The cash forecast is developed by applying to the existing base estimated changes based on forecasts of the variables discussed above. Furthermore, the statutory or administrative changes pertaining to any variable (see Statutory Changes) are taken into account. The result is a cash forecast for the period in question.

PERCENTAGE DISTRIBUTION OF CASH RECEIPTS

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
1995-96	31.1	23.7	20.1	25.1
1996-97	26.3	22.3	25.3	26.1
1997-98	26.3	25.4	25.0	23.3
1998-99	31.2	23.5	20.1	25.2
1999-2000	23.6	26.0	24.4	26.0
2000-01	29.3	23.1	21.1	26.5
2001-02	26.1	23.9	25.0	25.0
2002-03	29.1	21.5	24.6	24.8
2003-04 (est.)	28.1	25.7	22.6	23.6

ALCOHOLIC BEVERAGE TAXES AND ALCOHOLIC BEVERAGE CONTROL LICENSE FEES

BACKGROUND

Tax Base and Rate

Since 1933, after the repeal of National Prohibition, New York State has imposed excise taxes at various rates on liquor, beer, wine and specialty beverages. Licensed distributors and non-commercial importers of such beverages remit these taxes in the month following the month of delivery.

New York State distillers, brewers, wholesalers, retailers, and others who sell alcoholic beverages are required by law to be licensed by the State Liquor Authority.

Legislation enacted in 1990 increased the tax rate on all liquor with more than 2 percent alcohol by 21 percent. On July 1, 1994, the tax rates on natural sparkling and artificially carbonated sparkling wines were reduced from 25 cents per liter and 15 cents per liter, respectively, to 5 cents per liter, to equal the State excise tax rate on still wine. On January 1, 1996, the State excise tax rate on beer with at least 0.5 percent alcohol was reduced from 21 cents to 16 cents per gallon. On January 1, 1999, the State beer excise tax was further reduced to 13.5 cents per gallon. On April 1, 2001, the beer tax was cut an additional 1 cent per gallon. Effective September 1, 2003, the beer tax was further reduced to 11 cents per gallon.

State tax rates for 2003-04 are as follows (dollars per unit of measure):

Liquor over 24 percent alcohol	1.70 per liter
All other liquor with more than 2 percent alcohol	0.67 per liter
Liquor with not more than 2 percent alcohol	0.01 per liter
Natural sparkling wine	0.05 per liter
Artificially carbonated sparkling wine	0.05 per liter
Still wine	0.05 per liter
Beer with 0.5 percent or more alcohol	0.11 per gallon
Cider with more than 3.2 percent alcohol	0.01 per liter

Alcoholic beverage control license (ABCL) fees vary, depending upon the type and location of the establishment or premises operated as well as the class of beverage for which the license is issued.

DATA SOURCES

The primary sources of data used in the estimation and forecasting methodology for the alcoholic beverage tax are as follows:

- *RS-43, Department of Taxation and Finance Monthly Report of Receipts.* This report contains gross and net receipts data for alcoholic beverage taxes.
- *Alcoholic Beverage Tax Monthly Statistical Report, Department of Taxation and Finance.* This report contains alcoholic beverage monthly consumption data.
- *Alcoholic Beverage Control License Fees Monthly Report, Office of the State Comptroller.* This report contains gross and net receipts data for alcoholic beverage control license fee monthly collections.

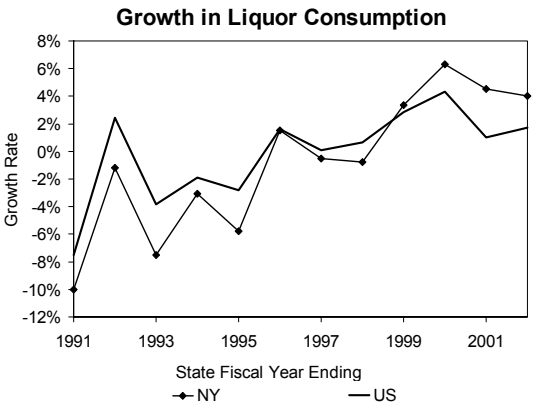
STATUTORY CHANGES

Historically, tax evasion has been a serious problem. Legislation enacted in 1993 added registration, invoice and manifest requirements, as well as seizure and forfeiture enforcement provisions. Additionally, the legislation provided higher fines based on the volumes of liquor bootlegged. These alcoholic beverage enforcement provisions have provided some protection to the State's liquor industry and tax base, moderating year-over-year declines in State alcoholic beverage tax receipts.

Legislation enacted in 1996, which required remittance of ABT liability through electronic funds transfer (EFT) by the State's largest vendors was repealed on April 8, 1997. The initial EFT provisions accelerated approximately $6.3 million into State fiscal year 1996-97, and the repeal of the provisions produced a similar one-time reduction in revenue in State fiscal year 1997-98.

FORECAST METHODOLOGY

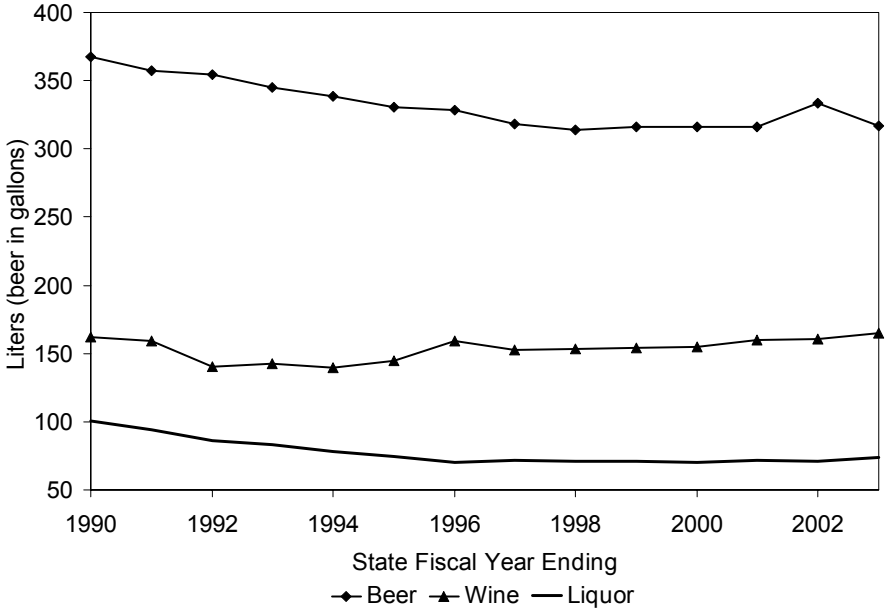
New York specific liquor consumption generally follows national trends. The chart below compares U.S. (using data from the Distilled Spirits Council of the U.S., Inc.) and New York consumption data. Consumption changes have a major effect on changes in excise tax receipts.



The forecast for this tax source is primarily based on an analysis of historical alcoholic beverage consumption trends. Data from the last several years indicate the secular decline in overall consumption has reversed itself. This can be attributed to the strong economy (until 2001), tax reductions and enforcement efforts. Three time series models have been developed for the per capita consumption of beer, liquor and wine. These time series methods put more weight on recent observations reflecting shifts in recent trends. The actual annual per capita consumption data covers the period from fiscal year 1970-71 through fiscal year 2002-03. The level smoothing weight and the trend smoothing weight in the model are selected to maximize the Akaike Information Criterion — a measure of error variation corrected for the number of parameters estimated. A summary of the statistical results of these models are reported as follows:

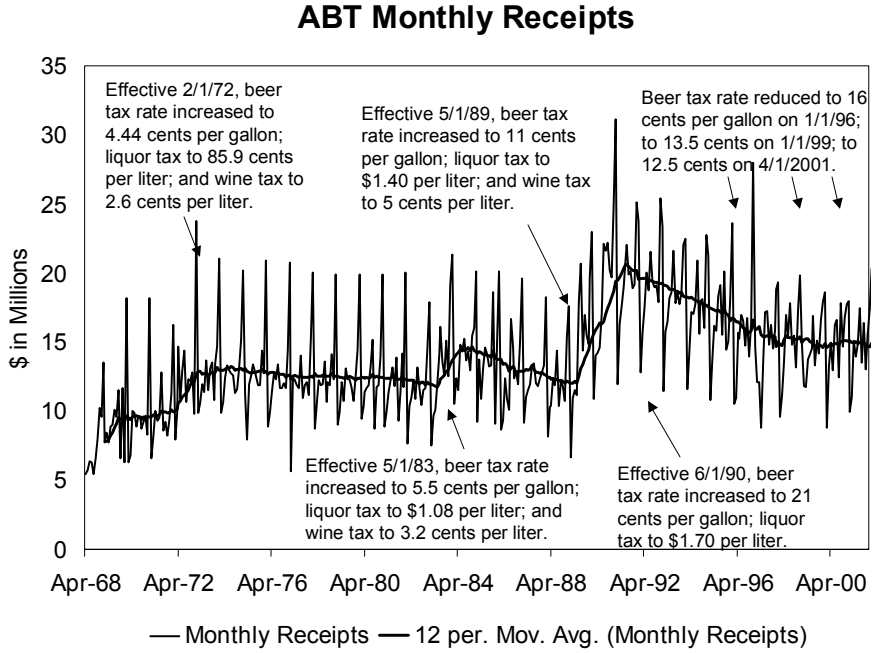
Statistics	Beer: Damped Trend Exponential Smoothing	Liquor: Damped Trend Exponential Smoothing	Wine: Damped Trend Exponential Smoothing
Level Smoothing Weight	0.8740	0.5438	0.8773
Trend Smoothing Weight	0.3136	0.7800	0.9990
Adjusted R-Square	0.9510	0.9930	0.9100

Consumption of Alcoholic Beverages



Final estimates are constructed using the time series model forecasts with the following adjustments:

- *Price Elasticity:* Price changes in different alcoholic beverages have different impacts on consumption. Currently, we are using the following price elasticities derived from the noted sources: beer, -0.3; liquor, -0.7; and wine, -0.7. (M. Grossman, J. L. Sinderlar, J. Mullahy and R. Anderson, Policy Watch: Alcohol and Cigarette Taxes, *Journal of Economic Perspectives*, V.7, Fall 1993; B. H. Baltagi and R. K. Goel, Quasi-Experimental Price Elasticity of Liquor Demand in the United States: 1960-83, *American Agricultural Economics Association*, May 1990.)
- *Cash Flow Results:* Tax collection experience and cash flow results are used to evaluate the estimate. Receipts year-to-date may indicate that the actual collections are slightly higher or lower than expected. From time-to-time, ABT receipts are understated or overstated due to misallocation to New York City. For instance, 1998-99 receipts were overstated by $1.8 million. Thus, we adjust that year before making the forecast.
- *Tax Policy Changes:* In the ABT collection history, legislative changes have been the main cause of significant revenue fluctuations. The beer tax rate was reduced from 16 cents per gallon to 13.5 cents per gallon, beginning January 1, 1999, to 12.5 cents per gallon, beginning April 1, 2001, and to 11 cents per gallon, beginning September 1, 2003. These reductions are estimated to have reduced revenue by $7.8 million, $3.1 million, and $2.4 million in 2003-04, respectively.
- *Enforcement:* The State continues to suffer tax evasion through the bootlegging of liquor from other states. As mentioned above, legislation enacted in 1997 extended the 1993 enforcement provisions from October 31, 1997, to October 31, 2002. Legislation enacted in 2002 extended these enforcement provisions from October 31, 2002, to October 31, 2007. ABT receipts in 2002-03 are estimated to have increased by $3 million due to enforcement efforts.



PERCENTAGE DISTRIBUTION OF CASH RECEIPTS

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
1995-96	25.4	27.7	24.1	22.8
1996-97	24.8	24.9	30.2	20.1
1997-98	22.3	27.3	27.8	22.6
1998-99	25.1	26.3	27.5	21.1
1999-2000	23.9	25.6	27.5	23.0
2000-01	24.6	26.2	27.4	21.8
2001-02	24.6	26.6	25.7	23.1
2002-03	25.8	26.6	25.1	22.5
2003-04 (est.)	26.4	27.5	25.4	20.7

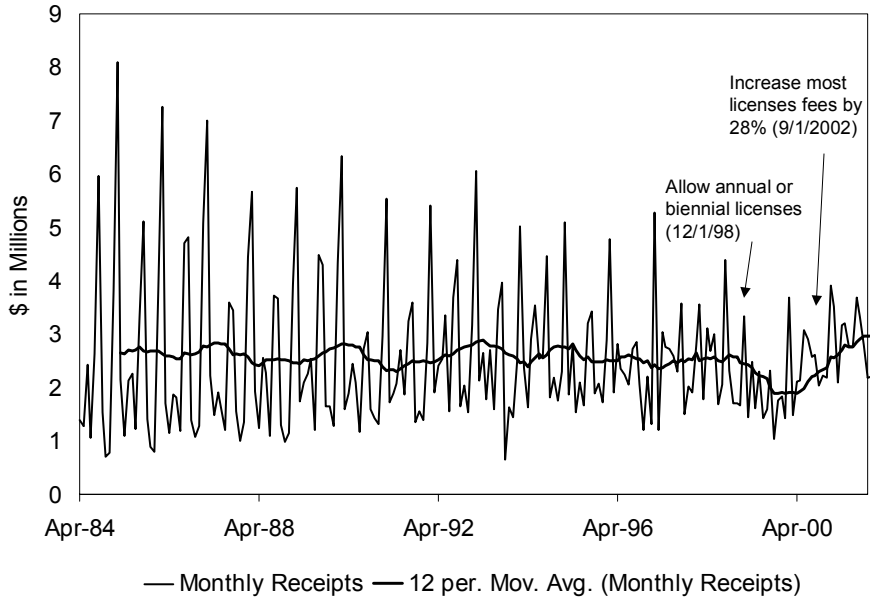
Risks to Forecast

The forecast partially is based on time series models that are subject to error, especially due to the possible omission of exogenous factors that may influence collections. Also, the ABT is collected at the wholesale level, so taxable gallonage may also fluctuate due to the uncertainty of inventory levels.

ALCOHOLIC BEVERAGE CONTROL LICENSE FEES

The estimate for ABCL fees is also based on collection trends. Historically, the base of the ABCL revenue has been declining. Until 1998-99, most license fees were issued for three-year periods. Therefore, collections peaked every three years. When current collections are compared to collections three years ago, net collections have declined in seven of the past ten years. Legislative changes played a very important role in 1999-2000 ABCL fees collections. Legislation enacted in 1997 eliminated the three-year license and permitted on-premises alcoholic beverage retailers to revert to single-year or biennial licenses. The estimated decline in ABCL receipts due to these changes was $9 million in 1999-2000. Legislation enacted in 2002 increased license fees for most licensees by 28 percent, effective September 1, 2002. It is estimated that the increase will increase ABCL fee collections by $8 million in 2002-03 and more than $10 million in 2003-04.

ABCL Fees Monthly Receipts



PERCENTAGE DISTRIBUTION OF CASH RECEIPTS

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
1995-96	21.4	27.7	19.0	31.9
1996-97	26.3	27.0	19.2	27.5
1997-98	27.9	27.7	17.8	26.6
1998-99	30.3	27.9	19.7	22.1
1999-2000	28.0	23.1	20.1	28.8
2000-01	17.8	27.8	21.9	32.5
2001-02	26.9	28.4	21.3	23.4
2002-03	19.6	24.6	24.6	31.2
2003-04 (est.)	29.3	29.7	18.1	23.0

HIGHWAY USE TAX

BACKGROUND

Tax Base and Rate

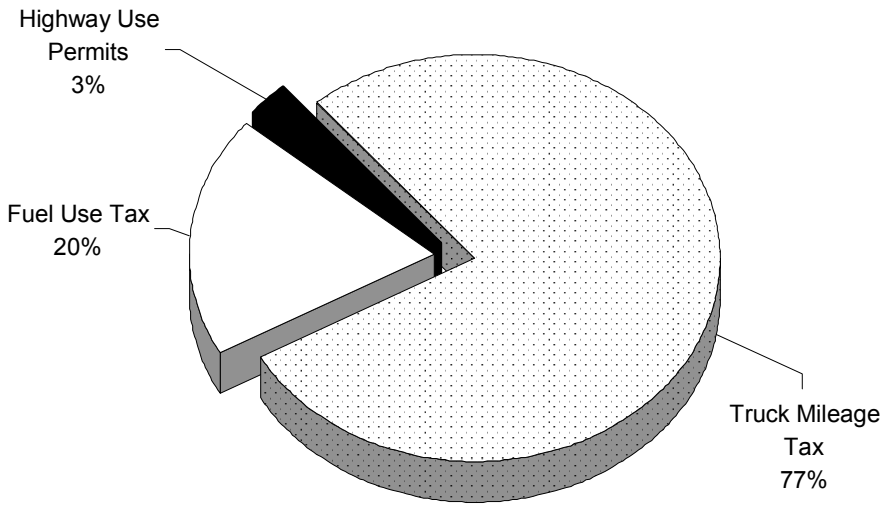
Articles 21 and 21A of the Tax Law impose a highway use tax on commercial vehicles using the public highways of the State. The highway use tax (HUT) includes three components: the truck mileage tax, the fuel use tax, and highway use permit fees. All highway use tax receipts are earmarked to the Dedicated Highway and Bridge Trust Fund.

The truck mileage tax (TMT) is levied on commercial vehicles having a loaded gross weight of more than 18,000 pounds or, at the option of the carrier, an unloaded weight in excess of 8,000 pounds for trucks and 4,000 pounds for tractors. The tax is imposed at rates graduated according to gross vehicle weight. The tax is calculated by multiplying the number of "laden" or "unladen" miles traveled on public highways of the State by the appropriate tax rate.

Highway use permits, used to denote those vehicles subject to the highway use tax, are issued triennially at $15 for an initial permit and $4 for a permit renewal. There are also special permits for the transportation of motor vehicles and for automotive fuel carriers, and for trips not to exceed 72 hours.

The fuel use tax is a complement to the motor fuel tax and the sales tax and is levied on commercial vehicles. In contrast to the motor fuel tax, which is imposed upon the amount of fuel purchased within the State, the fuel use tax is imposed on fuel purchased outside but used within New York. This tax is levied on the basis of the number of miles traveled on the public highways of the State. The aggregate fuel use tax rate is the sum of the appropriate motor fuel tax rate and the sales tax rate. The statewide rate of the sales tax component is 7 percent of the average price of fuel; a cents-per-gallon equivalent is set quarterly.

Components of Highway Use Tax Receipts
Estimated State Fiscal Year 2003-04



DATA SOURCES

The primary sources of data used in the estimation and forecasting methodology for the highway use tax are as follows:

- *RS-43, Department of Taxation and Finance Monthly Report of Receipts*. This report contains gross and net receipts data; and
- *Various U.S. and New York government agencies, including the U.S. Bureau of Economic Analysis of the Commerce Department.* These agencies provide economic data used in the econometric equation.

STATUTORY CHANGES

Truck Mileage Tax

Since 1951, the TMT has been levied on commercial vehicles having a loaded gross weight of more than 18,000 pounds. In 1961, the State gave carriers the option of using an unloaded weight basis to compute truck mileage tax liability. A motor carrier pays tax based on both the number of miles driven on the public highways of this State and the weight of the vehicle.

For State fiscal years 1990-91 through 1992-93, the economic recession retarded the demand for trucking. However, 1990 legislative changes contributed to large increases in highway use tax receipts. Legislation enacted in 1990 applied the truck mileage tax to New York State Thruway mileage. It also imposed a supplemental tax that effectively doubled truck mileage tax rates for all roadways other than the Thruway. Legislation enacted in 1994 reduced the truck mileage tax rates imposed on New York State Thruway mileage by one-half and eliminated such rates on January 1, 1996. The supplemental tax rate was reduced by 50 percent on January 1, 1999 (1998 legislation), and an additional 20 percent on April 1, 2001 (2000 legislation).

Fuel Use Tax

Legislation in 1977 expanded the fuel use tax to include a sales and use tax component. This law change altered the impact of fuel price changes on fuel use tax receipts. Increases in fuel prices tend to inhibit fuel consumption; in contrast, price increases raise the sales tax component rate and thereby fuel use tax collections.

Legislation in 1994 permitted taxpayers who purchase more fuel in New York State than they consume in the State to claim refunds or credits for all excess payments of State fuel use taxes beginning January 1, 1995, and authorized the State to join the federally mandated International Fuel Tax Agreement (IFTA) on January 1, 1996.

Legislation in 1995 reduced the automotive diesel fuel excise tax rate from 10 cents per gallon to 8 cents per gallon. As a result, the diesel fuel tax component of the fuel use tax was also reduced to 8 cents per gallon, effective January 1, 1996.

FORECAST METHODOLOGY

In formulating its projection, the Division of the Budget relies principally upon the relationship of real gross domestic product (GDP) and TMT receipts. A quarterly regression model with variables in logs is used to estimate TMT revenues.

TMT data are actual tax collections from the Department of Taxation and Finance, adjusted for tax policy changes and irregular audit receipts. Real GDP is gross domestic product chained to 2000 dollars from the DOB forecast. Two dummy variables are set for:

(1) the 1990 Tax Law change that applied the TMT rate to Thruway miles, which was eliminated in 1996; and (2) the 1990 Tax Law change that added a supplemental TMT, which was reduced by half in 1999 and an additional 20 percent in 2001. The model includes a correction for autocorrelation in the regression residuals. The equation with t-statistics is:

TRUCK MILEAGE TAX MODEL

$$\log(TMT_t) = \underset{(-5.51)}{-2.76} + \underset{(24.08)}{1.40}\log(GDP\ real_t) + \underset{(13.33)}{0.58}(dTMT_t) + \underset{(5.15)}{0.19}(dThruway_t) + u_t$$

$$u_t = \underset{(-5.42)}{-0.46} * u_{t-1}$$

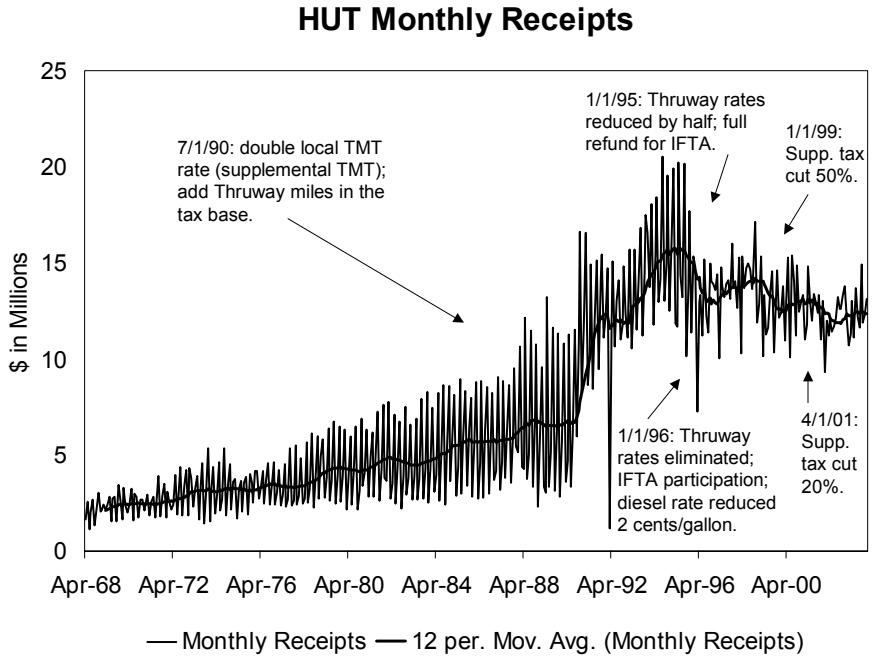
R-Bar Squared	0.99
Durbin-Watson Statistic	2.10
Root Mean Squared Error	0.06
Number of Observations	116

The model suggests a strong link between trucking industry performance and real GDP. The elasticity of TMT receipts to real GDP is estimated at 1.4.

Fuel use tax collections fluctuate with fuel consumption, especially diesel fuel, which is influenced by both economic conditions and fuel prices. As a motor fuel tax complement, it also is affected by the extent to which fuel use taxpayers purchase fuel within the State and thus pay New York motor fuel and sales taxes instead.

CASH RECEIPTS

Highway use tax collections for April 1968 through December 2003 are shown in the accompanying chart.



PERCENTAGE DISTRIBUTION OF CASH RECEIPTS

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
1995-96	27.2	25.6	25.2	22.0
1996-97	23.8	24.7	27.3	24.2
1997-98	25.3	24.9	26.5	23.2
1998-99	25.9	25.6	25.7	22.7
1999-2000	24.1	25.5	25.7	24.8
2000-01	24.6	26.2	25.9	23.3
2001-02	26.9	26.1	25.1	21.9
2002-03	24.0	25.8	27.0	23.2
2003-04 (est.)	25.7	26.3	25.3	22.6

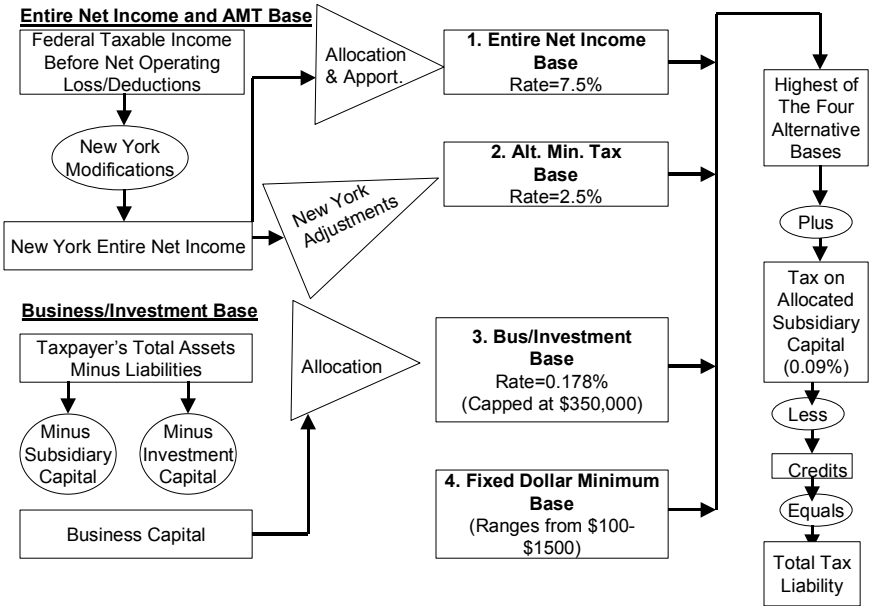
CORPORATION FRANCHISE TAX

BACKGROUND

Tax Base and Rate

Article 9-A imposes a franchise tax on general business corporations for the privilege of conducting business in New York. The franchise tax has four separate bases: allocated entire net income (ENI), allocated alternative minimum taxable income (AMTI), allocated business and investment capital, and a fixed dollar minimum. Corporations pay tax on the highest of these four bases, plus a tax on allocated subsidiary capital. Additionally, New York State corporations doing business in the Metropolitan Commuter Transportation District (MCTD) must pay an additional surcharge of 17 percent of total tax liability allocable within the MCTD. The following diagram shows the computation of tax liability, and the applicable tax rates for each base.

Computation of Tax Liability
(Current Law)



The allocated entire net income and allocated minimum taxable income bases generally start with Federal taxable income. Significant modifications to Federal taxable income include[1]:

- Exclusions: interest, dividends, and capital gains from subsidiary capital.
- Deductions: net operating losses and fifty percent of dividends from non-subsidiary corporations.
- Credits: investment tax credit (ITC) and employment incentive credit/wage credit, Empire Zone credits, alternative minimum tax credit, farmer's school tax credit and special additional mortgage recording credit.

[1] For a discussion and accounting of tax expenditures and tax credits related to the corporate franchise tax, see: *New York State Tax Expenditure Report*, published by the NYS Division of the Budget and the NYS Department of Taxation and Finance and *Analysis of Article 9-A General Business Corporation Franchise Tax Credits* published by the NYS Department of Taxation and Finance.

The following table provides a profile of corporate franchise taxpayers. This information comes from the *New York State Corporate Tax Statistical Report,*[2] which contains the most up-to-date published data on complete filings of C and S corporations.

PROFILE OF C AND S CORPORATIONS

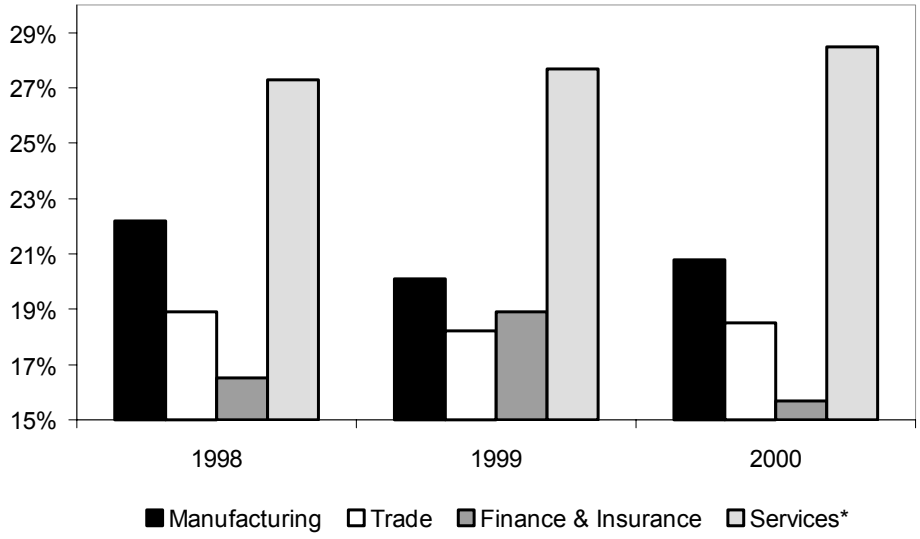
	1996	1997	1998	1999
			Number of Taxpayers	
Number of C Corporations	259,285	254,467	259,093	259,961
Number of S Corporations	254,236	265,429	280,051	286,122
			Tax Liability	
			(millions of dollars)	
C Corporations	1,527	1,509	1,433	1,615
S Corporations	145	167	192	147

As the table demonstrates, the liability for C corporations steadily declined during the period of 1996 to 1998, while the liability for S corporations steadily increased during the same period. The trends reversed in 1999, in which the liability for C corporations increased while that for S corporations decreased. The number of taxpayers for S corporations has increased each year, while the number of C corporations has remained fairly constant. Additionally, the table illustrates that, although the number of C and S corporation filers are roughly equal, C corporations represented nearly 88 percent of total liability in 1998 and 92 percent in 1999.

The following chart illustrates the fluctuation in the percentage of liability paid by the four industry groups that typically make up the vast majority of total tax liability for the period of 1998 to 2000. This information comes from the *Article 9-A Corporation Franchise Tax Study File,*[3] in which 2000 is the latest year for which Article 9-A tax return data are available. Liability for the finance and insurance sector tends to fluctuate significantly over time. Liability shares for this industry rose from 16.5 percent in 1998 to 18.9 percent in 1999, and then dropped to 15.7 percent in 2000. In comparison, the service industry's share of total liability had increased steadily for this same three-year period. The manufacturing industry's share of total liability is also quite volatile and depends on both economic conditions and the ability of the companies in this sector to take advantage of tax credit programs designed to stimulate the industry. For manufacturers, liability decreased in 1999 and then increased in 2000, a mirror image of the finance and insurance industry.

[2] 1999 New York State Corporate Tax Statistical Report (June 2003).
[3] Article 9-A Corporation Franchise Tax Study Files for 1998, 1999 and 2000.

Industry Profile: Percent of Total Liability (1998-2000)



* Services consist of real estate and rental and leasing; professional, scientific, and technical services; management of companies and enterprises; administrative and support and waste management and remediation services; art, entertainment, and recreation services; accommodation and food services; and other services. (NAICS Sectors 53, 54, 55, 56, 71, 72, and 81)

DATA SOURCES

The major sources of data used to forecast this tax include:

- *S-43 Department of Taxation and Finance Monthly Report of Corporation Tax.* This report, issued by the Office of Tax Policy Analysis (OTPA), provides reconciled monthly collections of corporate franchise tax receipts by filing periods.
- *New York State Corporate Tax Statistical Report.* This publication is a statistical report published by OTPA. The report provides a detailed summary of corporate tax data.
- *Analysis of Article 9-A General Business Corporation Franchise Tax Credit Report.* This report, published by OTPA, provides an accounting of credit activity under Article 9-A.
- *Article 9-A Corporation Franchise Tax Study File.* These files are compiled by the Department of Taxation and Finance and include all corporations filing under Article 9-A, except S corporations and fixed dollar minimum tax filers. It includes selected data items from the tax returns of each corporation. The most recent data available are from the 2000 tax year.

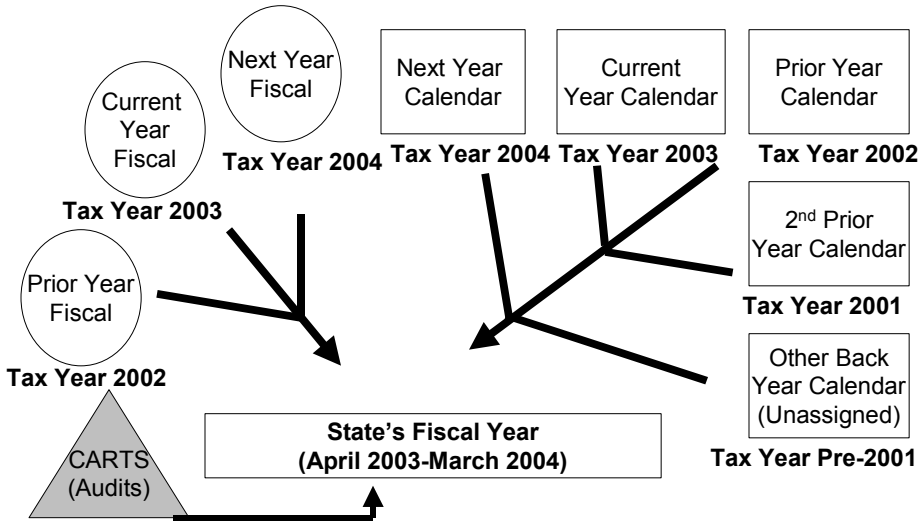
STATUTORY CHANGES

A number of Tax Law changes have had a substantial impact on Article 9-A collections. For New York State statutory changes to the corporation franchise tax, see the most recent *New York State Executive Budget Appendix II*.

FORECAST METHODOLOGY

Cash collections of State fiscal year corporate franchise taxes are determined by a complicated interplay between payments on estimated current year liability and corrections to prior year payments based on revised estimates of prior year liability. Additionally, variability in audit collections affects cash results. The impact of payment rules on estimated payments also accounts for changes in collection patterns. The following figure graphically details the differences between State fiscal year cash collections and corporate liability payments.

Conversion of Corporate Franchise Tax Collections From Estimated Liability Year to State Fiscal Year



Current Year Forecast

For the current year forecast, we analyze trends in the cash components of collections. For example, current payments received, year to date, are compared to historical receipt amounts as a share of total payments for the State fiscal year, to estimate the remaining receipts for the year. By tracking each of the individual components that make up State fiscal year collections, we are able to apply historical trends to forecast the individual components.

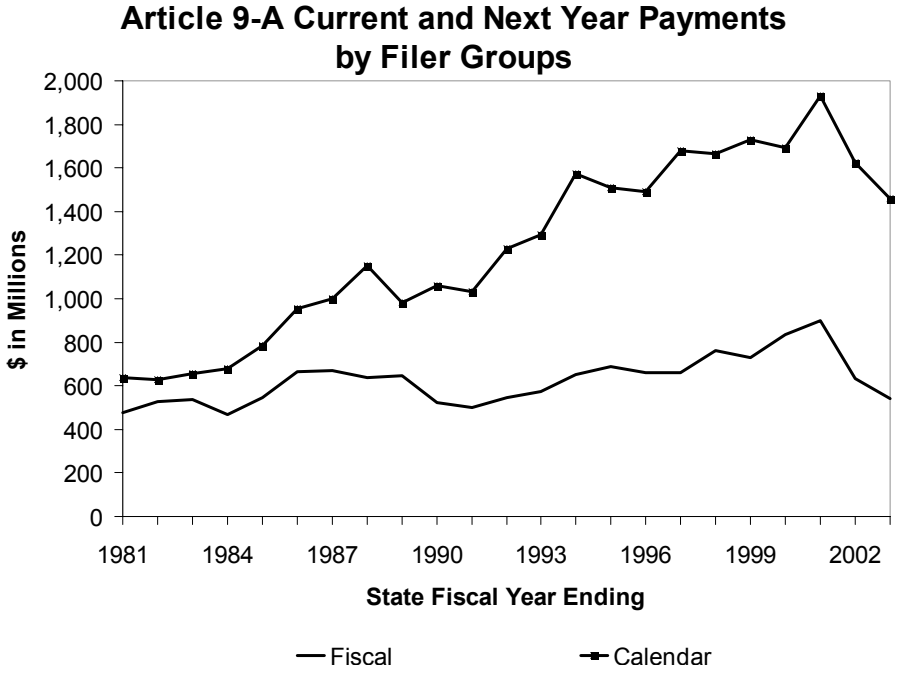
During the State fiscal year, a calendar-year filer (tax year beginning on January 1) will make payments on estimated liability (Current Year Calendar) and a prepayment on next year's liability (Next Year Calendar), which, required by law, equals to 30 percent of current year's liability.[4] Additionally, firms may file an amended declaration of estimated tax at any time to correct or change estimated liabilities from prior tax years. These adjustments to estimated liability from prior periods can be quite volatile and significant. Additionally, prior year collection activity, such as audits, that cannot be assigned to a liability period, impact fiscal year cash collections.

Currently, the forecasting methodology employed tracks the seven liability payment streams and the other unassigned liability payments (Other Back Year Calendar and CARTS) indicated in the figure above to arrive at estimates of State fiscal year collections.

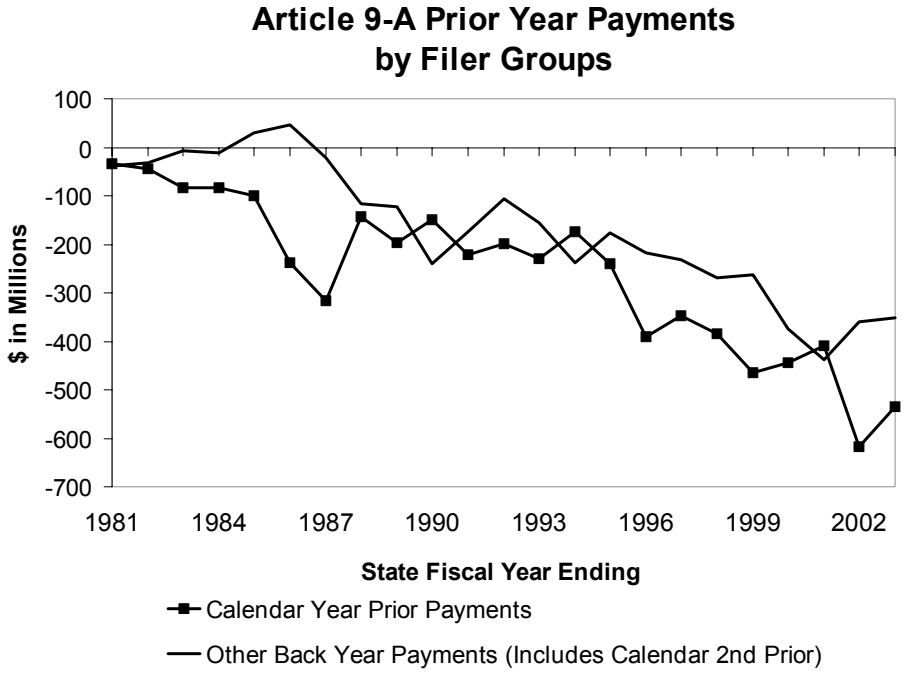
[4] The first installment requirement increased to 30 percent from 25 percent for tax years beginning on or after January 1, 2003.

The following two graphs illustrate the seven payments that are tracked within a State fiscal year (2nd Prior Calendar payments and Other Back Year payments have been combined).

The following graph indicates that current year and next year calendar payments account for a large portion of total State fiscal year payments.



The next graph, showing prior year payments by filer groups, demonstrates the growing negative liability represented by the back year payments and adjustments. These large adjustments, however, have begun to moderate and are expected to track more traditional historical patterns in the outyears.



Additionally, and most importantly, by tracking the payments from different periods, we are also trying to establish a link between tax liability and underlying economic fundamentals.

Outyear Forecast

Several approaches are used to forecast outyear receipts:

- Examining the profit forecasts for large multinational corporations with a large presence in New York State.
- Employing an econometric model using corporate profits and tax rate changes to forecast gross receipts in the outyears. This model operates on the principal that profits and ENI rate changes ultimately determine the future flow of receipts with lags.
- Refunds in the outyears are forecasted using a historical average of forecasted gross receipts from the econometric model. Historically, refunds have consistently totaled approximately 9.5 percent of the two prior calendar year's gross receipts.

PERCENT CHANGE IN KEY VARIABLES
STATE FISCAL YEARS 1998-99 TO 2003-04

	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04 (Estimated)
Tax Collections*	(1.6)	(5.3)	19.7	(34.9)	(6.8)	(1.8)
Corporate Profits**	(7.8)	7.0	(1.9)	(14.0)	(8.7)	25.3
Tax Rates***	9.0	8.5	8.0	7.5	7.5	7.5

* Tax collections also reflect Tax law changes.
** Corporate Profits was adjusted for 2002-03 for Federal depreciation allowances.
*** The tax rate represents the actual tax rate paid under the entire net income base.

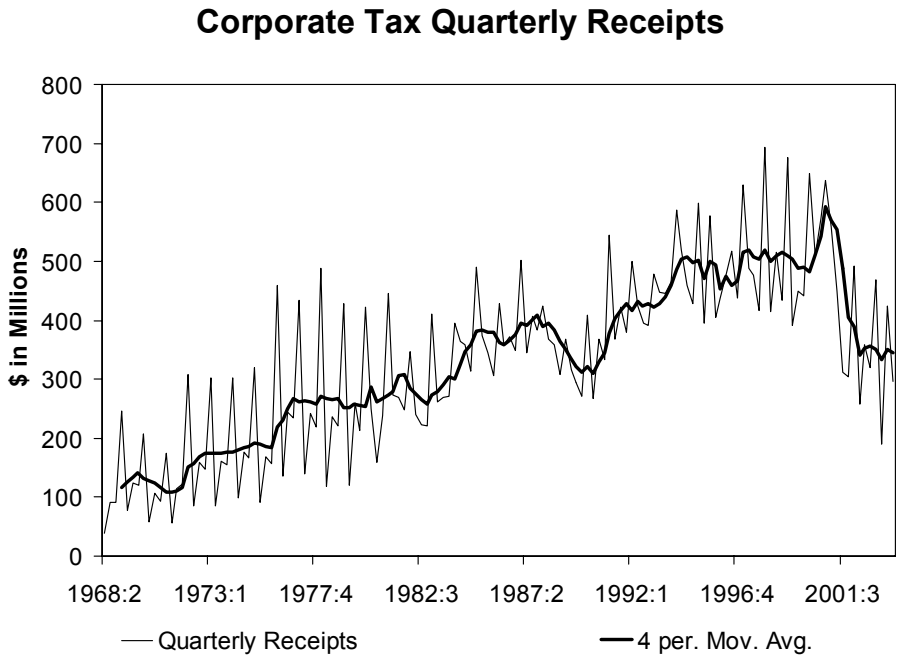
Cash Receipts

For Federal and State tax purposes, general business corporations operate either on a calendar year or, where the taxable fiscal year ends on the last day of a month other than December, on a fiscal-year basis. The tax year for State purposes must be the same as for the Federal tax year. All corporations follow a quarterly payment cycle with payment dates for calendar year corporations on the fifteenth day of March, June, September, and December. During any State fiscal year, collections under the corporation franchise tax reflect payments by corporations for two tax liability periods. For example, during State fiscal year 2003-04, calendar year taxpayers are making payments on 2003 estimated liability and a first installment on 2004 liability; fiscal year taxpayers are making final payments on 2003 estimated liability and payments on 2004 estimated liability.

PERCENTAGE DISTRIBUTION OF GENERAL FUND COLLECTIONS

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
1995-96	21.80	31.75	22.31	24.13
1996-97	23.14	25.11	21.20	30.55
1997-98	23.54	22.94	20.11	33.41
1998-99	20.30	25.29	21.27	33.14
1999-00	20.25	23.28	22.91	33.56
2000-01	22.00	24.79	27.54	25.67
2001-02	29.93	21.49	21.45	27.13
2002-03	18.34	25.51	22.72	33.44
2003-04 (est.)	13.68	30.72	21.35	34.25

The following graph demonstrates the data reflecting quarterly payments. The four-quarter moving average illustrates that the growth in collections is more moderate and less volatile than we would expect when just examining quarterly collections. It is apparent, however, that there has been significant cyclical behavior in corporate collections.



Current year collections can be strongly influenced by transactions occurring in earlier tax years, particularly by refunds and credit carry-forwards resulting from the overpayment of tax in prior years. The collection of assessments following the audit of returns filed for past years can strongly influence cash results in any particular year.

Risks to the Forecast

The corporate franchise tax forecasts involve, in large part, managing uncertainties, as follows:

- The most significant risk to the forecast comes from the volatile relationship between the economic and liability factors, which determine cash receipts. These relationships can be significantly altered due to collection patterns and adjustments made to previous years' liability.
- Errors in the forecast of the corporate profit variable used to drive outyear receipts provide an additional risk to the corporate franchise tax estimate.

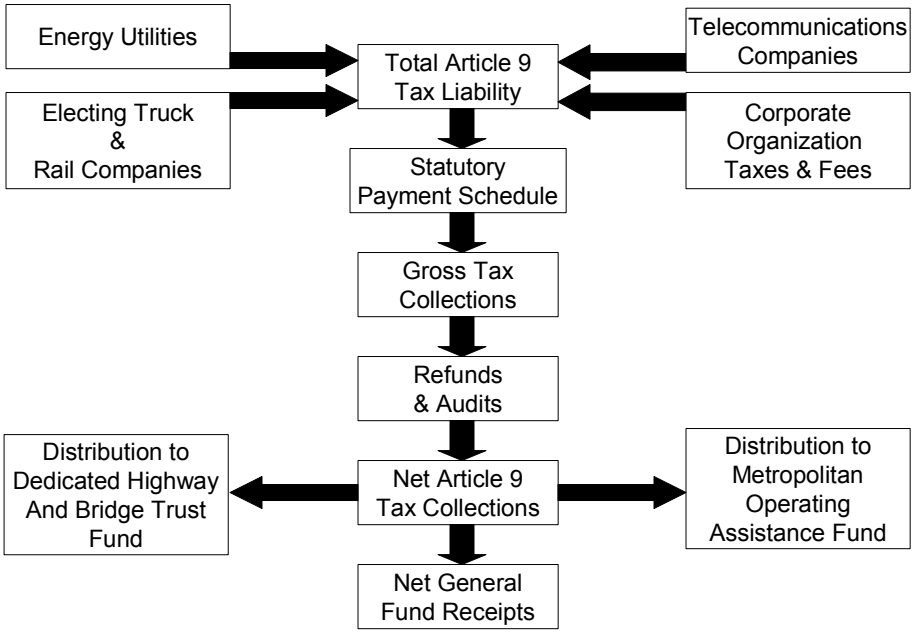
As a result, analyzing industry trends and assessing risks are quite important in adjusting the DOB corporate franchise tax forecast.

CORPORATION AND UTILITIES TAXES

BACKGROUND

Tax Base and Rate

Article 9 of the Tax Law imposes taxes on a number of industries, including public utilities, newly organized or reorganized corporations, out-of-State corporations doing business in New York State, transportation and transmission companies, and agricultural cooperatives. The primary source of Article 9 State revenue comes from gross receipts taxes on the public utility, telecommunications and transportation industries. Recent statutory and regulatory changes have significantly diminished the role of traditional energy utilities as the primary source of Article 9 receipts. The 2003-04 Enacted Budget included legislation that would transfer the remaining 20 percent of sections 183 and 184 of Article 9 to the Dedicated Highway and Bridge Trust Fund (DHBTF) beginning on April 1, 2004. The following chart shows the sources and disposition of Article 9 receipts.



The gross income of a utility includes receipts from the sale of services, receipts from rents, royalties, interest and dividends, as well as profits from the sale of securities, real property or other assets. Historically, there have been very few asset sales. However, as a result of deregulation, companies were required to sell their generating plants. In addition, a few companies have divested some of their nuclear plants. Typically, the forecasts deal with revenues from sales of energy, water and telecommunications services.

DATA SOURCES

The corporation and utility tax estimate is derived using a variety of data sources from both public and private sources, including the following:

- *S-43 Department of Taxation and Finance Monthly Report of Corporation Tax.* This report, issued by the Office of Tax Policy Analysis (OTPA) at the New York State Department of Taxation and Finance, provides reconciled monthly collections of corporation and utilities taxes receipts by filing periods.

- *New York State Corporate Tax Statistical Report.* This report is published by the Department of Taxation and Finance s OTPA and provides a detailed summary of corporation and utilities taxes data.
- *Value Line Investment Survey.* Electricity, Natural Gas, and the Telecommunication Industries are used in the estimation process.
- *Securities and Exchange (SEC) Web Site (http://www.sec.gov).* This web site is monitored for relevant quarterly (10-Q) and annual (10-K) financial reports.
- *Public Service Commission.* Reports annual utility data.
- *Other Publications.* Wall Street Journal, New York Times, Business Week, Barrons, and Crain's.

STATUTORY CHANGES

A number of Tax Law changes have had a substantial impact on Article 9 collections. For New York State statutory changes to the corporation and utilities taxes, see the most recent *New York State Executive Budget Appendix II.*

FORECAST METHODOLOGY

Current Year Forecast

In the current year, the estimation process is based on a blend of historical collection patterns, collections to date, taxpayer estimated liability, the econometric models listed below, and statutory changes or other occurrences that may affect collections.

Outyear Forecast

For the three future fiscal years projected in the Budget, econometric models drive the forecast. Steam, water and telecommunications revenues are forecast using a set of simple econometric models. The structures of the models are as follows:

Steam
- Steam revenues = function (New York specific employment).

Water
- Water revenues = function (New York specific employment; consumer price index).

Telecommunications
- Telecommunications revenues = function (prior year telecommunication revenues multiplied by a historical growth factor).

Energy revenues (electricity and natural gas) are a summation of separately forecasted quantities and prices by general customer class. This approach is necessary because of different pricing structures between residential and business utility services. Also, natural gas sales may offset changes in electric demand, as in years with mild summers, reducing cooling demand, but with severe winters increasing heating demand. The following model structure is employed:

Electricity
- Residential Quantity = function (cooling degree days, a moving average of New York specific residential price, the price deflator for residential electric use, U.S. electricity sales to end users shared to New York by the ratio of New York population to U.S. population, time trend);

- Residential Price = function (residential electric price for the Mid-Atlantic Region; except that for 1999 through 2002 prices are fixed by the Public Service Commission for New York electric utilities and a weighted average of such prices is used in the current forecast for the period after 2002);
- Commercial & Industrial Quantity = function (New York specific commercial and industrial price);
- Commercial & Industrial Price = function (commercial and industrial electric price for the Mid-Atlantic Region; except that for 1999 through 2002 prices are fixed by the Public Service Commission for New York electric utilities and a weighted average of such prices is used in the current forecast for the period after 2002);

Natural Gas

- Residential Quantity = function (heating degree days, the number of New York natural gas customers, the U.S. price deflator for residential natural gas use shared by the ratio of New York consumer price inflation to U.S. consumer price inflation, and U.S. gas consumption shared by New York to U.S. population);
- Residential Price = function (an inflation factor for utility natural gas, and the U.S. price deflator for residential natural gas use shared by the ratio of New York consumer price inflation to U.S. consumer price inflation);
- Commercial & Industrial Quantity = function (New York specific employment, time trend);
- Commercial & Industrial Price = function (wholesale price index for utility natural gas, time trend);

The following table reports the percent changes for the major economic variables impacting the receipts estimates.

EXOGENOUS VARIABLES
percent change

	1997	1998	1999	2000	2001	2002	2003	2004 (Estimated)
New York Specific Employment	1.39	2.40	2.47	2.15	(0.59)	(1.77)	(0.40)	(0.77)
Utility Natural Gas Price Index	7.13	(3.31)	1.54	16.90	19.92	(14.68)	23.95	2.35
Electric Power Price Index	0.38	(3.86)	(0.85)	1.59	7.19	(1.04)	2.89	2.10
Cooling Degree Days[1]	(2.90)	32.51	16.05	(37.03)	39.75	14.16	(56.88)	NA
Heating Degree Days[1]	(2.53)	(16.71)	9.22	8.25	(9.57)	4.50	10.24	NA
Population	0.39	0.55	0.67	0.60	0.43	0.37	0.29	0.20
New York Specific Consumer Price Index	2.35	1.62	2.04	3.22	2.65	2.19	2.83	2.09

[1] Heating and cooling degree-days (from economy.com) are included in our model, but only through the period for which we have actuals.

Forecast prices and quantities are then combined to derive gross receipts growth rates for each Article 9 Tax Law section for current and outyears.

The liability growth rates are then applied to the current year's tax base to derive calendar year estimates. Tax rates are applied to projections of gross receipts to generate tax liability estimates for each section of law. Payment schedules are applied to the liability estimates to derive State fiscal year cash receipts. Fiscal year receipts are then adjusted to reflect the estimated effects of law revisions and other non-economic factors that affect collections. Historical monthly patterns are applied to the fiscal year projections to derive monthly cash flow estimates. Although the payment schedules are fixed in statute, a small number of returns (delayed returns, taxpayer fiscal year basis other than calendar year, adjusted returns, etc.) and refunds or audits paid occur during the months not ending a quarter.

The table below summarizes the results from the model described above. The various tax rates for each section of the tax are applied to the results and distributed to the proper fiscal year.

NEW YORK UTILITY MODEL RESULTS

Calendar Year	New York Electricity (Sales * Price)	Percent Change	New York Natural Gas (Sales * Price)	Percent Change	New York Steam & Water (Sales * Price)	Percent Change
2001	15,277	NA	5,339	NA	595	NA
2002	15,347	0.5	4,743	(11.2)	557	(6.5)
2003	15,347	0.0	5,436	14.6	577	3.6
2004	15,555	1.4	5,504	1.3	564	(2.3)

Telecommunications liability increased in 2001 by 3.8 percent and by 0.7 percent in 2002. We do not expect unusually strong growth in the outyears as the demand in the wireless market continues to soften. The enactment of section 186-e in 1995, which provided a new methodology for allocating interstate revenues from long distance telephone services, influenced the collections of this section. The following tables report the history used to generate our forecast.

PERCENT GROWTH OF TELECOMMUNICATION LIABILITY

	1999	2000	2001	2002	2003	2004
Growth	5.2	(17.4)	3.84	0.65	(0.11)	0.67

The following tables report the growth in the energy components subject to tax.

CALENDAR YEAR HISTORY OF ELECTRICITY
FOR RESIDENTIAL AND COMMERCIAL/INDUSTRIAL CUSTOMERS [1]
1996 TO 2002

	Residential				Commercial/Industrial			
Year	Sales	Percent Change	Price (dollars)	Percent Change	Sales	Percent Change	Price (dollars)	Percent Change
1996	38,488	NA	14.48	NA	72,139	NA	10.61	NA
1997	38,289	(0.5)	14.57	(0.6)	72,747	0.8	10.17	(4.1)
1998	30,996	(19.0)	13.98	(4.0)	62,585	(14.0)	8.76	(13.9)
1999	32,659	5.4	13.77	(1.5)	58,238	(6.9)	8.51	(2.9)
2000	31,864	(2.4)	14.64	6.3	54,078	(7.1)	9.50	(11.6)
2001	32,345	1.5	14.57	(0.5)	53,739	(0.6)	9.55	0.5
2002	33,637	4.0	13.78	(5.4)	50,979	(5.1)	8.95	(6.3)

[1] Source: New York State Public Service Commission. Data after 1997 does not include LILCO. Represents most current data to date.

CALENDAR YEAR HISTORY OF NATURAL GAS
FOR RESIDENTIAL AND COMMERCIAL/INDUSTRIAL CUSTOMERS [1]
1996 TO 2002

	Residential				Commercial/Industrial			
Year	Sales	Percent Change	Price (dollars)	Percent Change	Sales	Percent Change	Price (dollars)	Percent Change
1996	225.0	NA	8.90	NA	140.6	NA	6.23	NA
1997	215.6	(15.5)	9.43	6.0	135.2	(3.8)	6.12	(1.8)
1998	150.6	(30.1)	9.35	(0.8)	84.1	(37.8)	5.44	(11.1)
1999	160.6	6.6	8.93	(4.5)	86.5	2.9	5.00	(8.1)
2000	170.9	6.4	9.48	6.2	92.1	6.5	5.78	15.6
2001	157.2	(8.0)	10.94	15.4	80.4	(12.7)	8.30	43.6
2002	151.5	(3.6)	9.80	(10.4)	77.0	(4.2)	7.18	(13.5)

[1] Source: New York State Public Service Commission. Data after 1997 does not include LILCO. Represents most current data to date.

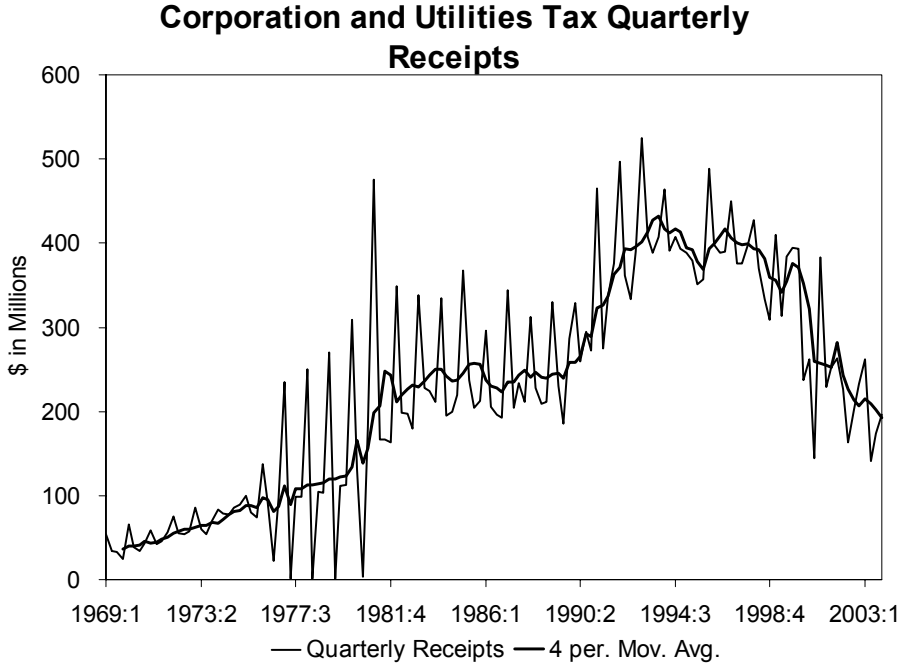
Cash Receipts

The table below illustrates the general fund collections on a quarterly basis.

PERCENT DISTRIBUTION OF GENERAL FUND COLLECTIONS

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
1995-96	31.06	22.65	22.27	24.05
1996-97	24.48	25.01	23.96	26.55
1997-98	24.26	24.62	24.93	26.19
1998-99	23.45	21.72	28.51	25.66
1999-2000	21.37	26.26	27.14	25.23
2000-01	27.92	29.31	16.34	25.73
2001-02	23.60	26.00	27.10	23.30
2002-03	18.94	23.54	27.10	30.42
2003-04 (est.)	18.68	22.99	26.17	32.11

Article 9 taxes, as shown in the chart below, are paid quarterly. Taxpayers make estimated payments in March, June, September, and December.



Risks to the Forecast

Changes in the price of energy and telecommunication services are somewhat volatile as of late and could have a significant impact on outyear projections. The telecommunications forecast assumes the stagnation of growth in the industry, especially within the information technology, wireless, and Internet markets. This slowed growth is the result of market saturation, deregulation, over investment and product feature bundling. As market saturation occurs, demand could fall, resulting in a level of consumption below the current forecast. However, it has been suggested that companies in the wireless market are introducing new technology and more services, which could create a surge of demand in the industry. Prices are sensitive to changes in supply and demand, disposable income, business market conditions, changes in technology, and general inflation.

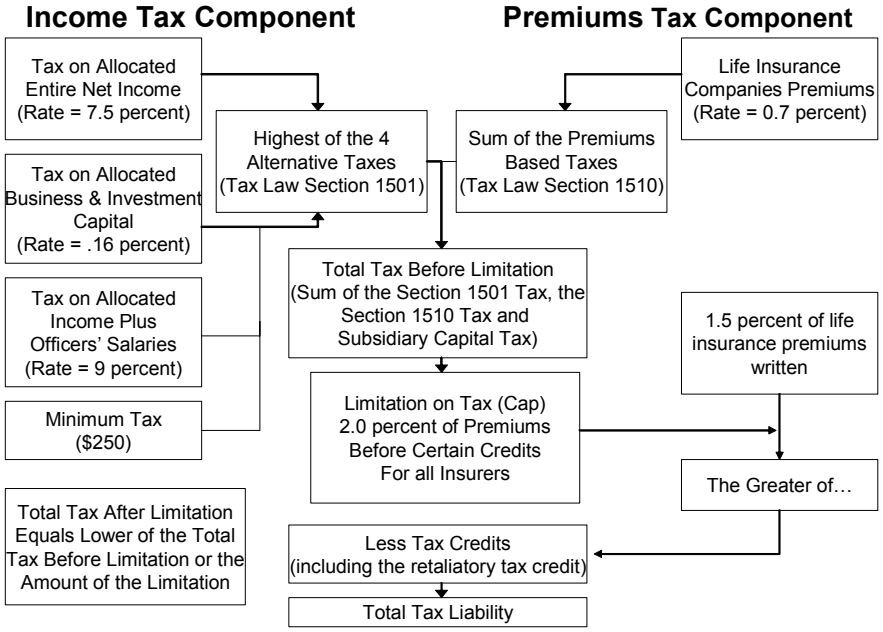
Statutory and administrative changes could also increase the possibility for estimating error. Although changes in tax rates are relatively straightforward to estimate from a common base, changes to the base are more problematic. Even for base change estimates of which the forecaster is relatively confident, taxpayers may not understand the true effects of the change on their liability. This may lead to miscalculations of tax, resulting in future amended returns with make-up payments or significant refund requests.

INSURANCE TAXES

BACKGROUND

Tax Base and Rate

Article 33 of the Tax Law imposes a franchise tax on insurance companies. Legislation included in the 2003-04 Enacted Budget changed the insurance tax structure. For life insurers, the tax currently has two components. The first component, like the bank and corporation franchise taxes, is based on the highest of four alternative bases. The second component is a tax on gross premiums depending on the type of insurer. In addition, a 0.08 percent tax rate applies to allocated subsidiary capital. The chart below depicts the new structure of the Article 33 insurance tax on life insurers.

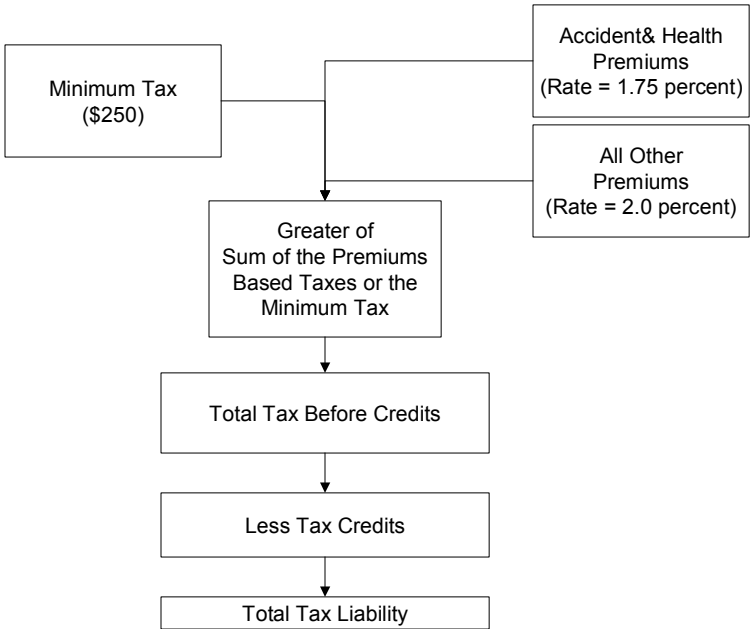


The income tax component is imposed on one of several measures of an insurance corporation's economic activity within the State. Most taxpayers pay under the entire net income (ENI) base. The current tax rate on ENI equals 7.5 percent. Taxpayers allocate receipts according to the ratio of New York premiums and payroll to total premiums and payroll nationwide.

The premiums tax component is based on net premiums received or written by insurance corporations on risks, resident or located within the State. Article 33 also provides for a limitation on tax liability, which caps the total tax before credits at 2.0 percent of taxable premiums for all insurers.

For all other insurers, the income base is eliminated, as well as other non-premium bases besides the fixed dollar minimum. The premiums base tax is changed to 1.75 percent for accident and health premiums and 2.0 percent for all other insurers. The legislation was effective for tax years beginning on or after January 1, 2003, and is expected to generate approximately $158 million in State fiscal year 2003-04. The chart below depicts the new structure of the Article 33 insurance tax for all non-life insurers.

Non-Life Insurers



Retaliatory Taxes

The Insurance Law authorizes the Superintendent of Insurance to assess and collect retaliatory taxes from a foreign insurance corporation when the overall tax rate imposed by its home jurisdiction on New York companies exceeds the comparable tax rate imposed by New York on such foreign insurance companies.

Retaliatory taxes have been used by the states since the nineteenth century, ostensibly to ensure a measure of fairness in the interstate taxation of their domestic insurance corporations. Retaliatory taxes deter other states from discriminating against foreign corporations and effectively require states with a domestic insurance industry to maintain an overall tax rate on insurance corporations that is generally consistent with other states.

Nevertheless, there are a variety of mechanisms for taxing insurance corporations throughout the states, and differences in overall tax rates among the states are inevitable. New York provides an additional measure of protection for its domestic insurance industry by allowing domestic corporations to claim a credit under Article 33 of the Tax Law for 90 percent of the retaliatory taxes legally required to be paid to other states.

The Insurance Law also imposes a premiums tax on licensed excess lines insurance brokers when policies covering New York risks are procured through such brokers from unauthorized insurers. Transactions involving licensed excess lines brokers and insurers not authorized to do business in New York are permissible under limited circumstances delineated in Article 21 of the Insurance Law. The tax is imposed at a rate of 3.6 percent of premiums covering risks located in New York.

DATA SOURCES

The insurance tax estimate is derived using a variety of data sources from both the public and private sectors, including the following:

- *2000 Article 33 Insurance Tax Study File.* This file, compiled by the Department of Taxation and Finance, includes selected data from all businesses filing tax returns under Article 33.
- *S-43 Department of Taxation and Finance Monthly Report of Corporation Tax.* This report, issued by the Office of Tax Policy Analysis (OTPA) at the New York State Department of Taxation and Finance, provides reconciled monthly collections of insurance tax receipts by filing periods.
- *New York State Corporate Tax Statistical Report.* This report is published by the Department of Taxation and Finance's OTPA. It provides a detailed summary of insurance tax data.
- *Value Line Investment Survey.* Insurance Industry.
- *Securities and Exchange Commission (SEC) Website.* This web site is monitored for relevant quarterly (10-Q) and annual (10-K) financial reports.
- *New York State Insurance Department.* Detail on lines of property and casualty insurance.
- *Other Publications.* Wall Street Journal, New York Times, Business Week, Barrons, A.M. Best Review, and Crain's.

STATUTORY CHANGES

A number of tax law changes have had a substantial impact on Article 33 collections. For New York State statutory changes to the insurance tax, see the most recent *New York State Executive Budget Appendix II*.

FORECAST METHODOLOGY

Current Year Forecast

In the current year, the estimation process is based on a blend of historical collection patterns, collections to date, the econometric models listed below, and statutory changes or other occurrences that may affect collections.

Outyear Forecast

Our methodology used in forecasting insurance receipts changed in 2003. In our previous methodology, we used actual data on property and casualty premiums from the New York State Insurance Department as a basis for the outyear forecast. For other insurance premiums, we previously used industry data from other sources to project growth rates. This method has been replaced with a simple model that utilizes variables from our economic models to forecast liability for the outyears. The most current information from the Insurance Department for years beyond what the study file provides (currently, we have through 2002) is still used as a check against the model results for those years.

Insurance premiums are divided into three broad categories: property/casualty, life/health, and accidental and life sold by non-life insurance companies. Net income is aggregated over all firms and modeled separately. Because of the short length of the available data series, a premium was placed on parsimony in the specification of these models. Moreover, the dependent variable for each equation was transformed into logs and then first-differenced in order to minimize the risk of spurious regression.

Property/Casualty

Total property/casualty premiums are made up of premiums written in each line of insurance. The five largest lines of business — automobile, workers' compensation, commercial multi-peril, general liability, and homeowners' multi-peril — accounted for more than 80 percent of premiums from the Article 33 study file during the 1985-2000 period. Because a large portion of the insurance payouts in this category is related to the treatment of injury, medical care cost inflation has tended to be a significant driving force explaining premium growth over time. To capture the impact of rising medical costs on premium growth, the model includes the medical care component of the Consumer Price Index. The model also includes a dummy variable for 1988.

The historical growth rates of the major lines of P/C premiums are shown in the table below. This information is provided by the Insurance Department.

CALENDAR YEAR PREMIUMS GROWTH
(GROWTH RATE PERCENTAGES)
1995 TO 2002

	1995	1996	1997	1998	1999	2000	2001	2002
Property/Casualty (Total Premiums)	0.8	0.3	(0.3)	3.9	(4.1)	4.9	11.7	12.9
Automobile	4.0	6.2	0.3	1.5	(0.4)	0.7	11.5	10.6
Workers Compensation	(3.2)	(14.5)	(12.7)	(1.4)	1.4	15.8	4.1	4.0
Commercial Multi-Peril	4.7	(2.0)	(3.2)	2.0	(3.3)	4.2	4.5	23.1
General Liability	(6.5)	(0.1)	13.0	30.9	(33.3)	17.7	14.3	35.2
Homeowners Multi Peril	5.3	4.4	3.9	2.3	2.3	4.3	6.2	7.8

Life/Health

The most significant driving force behind the aggregation of life and health insurance premiums is growth in the State working age population between the ages of 25 and 64. Therefore, the first difference in the log of this variable is included in the model.

Accident/Health

Premium growth in this category was flat between 1985 and 1992, after which growth appears to closely track medical care inflation. This effect is captured by creating an interaction dummy variable that is equal to zero between 1985 and 1992 and equal to the first difference in the log of the medical care component of the Consumer Price Index for the period from 1993 and beyond. The model also includes a dummy variable for 1988.

Net Income

Net income earned by insurance carriers tends to vary inversely with long-term interest rates. Therefore, the first difference in the ten-year Treasury note is included in the model. The first difference in the tax rate on net income is also included to capture the behavioral response by firms to a change in the tax rate.

To further refine the net income estimate, an analysis of industry trends with particular attention to industry leaders is used. Several publications, including Value Line and Best's, provide estimates of the future earnings of the industry as a whole and industry leaders with a large New York presence.

The table below summarizes the formulas used in the outyear insurance model.

INSURANCE MODEL FORMULAS FOR GENERATING FORECAST (1985-2000)

$\triangle \ln(PRPC)_t = 0.65 * \triangle \ln(CPIMED)_t - 0.08 * D88_t$ *t-values* 2.92 (1.63)	DW = 1.1478	adj. R^2 = 0.18
$\triangle \ln(PRLH)_t = 6.28 * \triangle \ln(NR2564NY)_t$ *t-values* 4.61	DW = 1.1732	adj. R^2 = 0.19
$\triangle \ln(PRAL)_t = 0.05 + 2.49 * DCPIMED_t - 0.20 * D88_t$ *t-values* 2.80 (1.63)	DW = 2.6411	adj. R^2 = 0.59
$\triangle \ln(ENI)_t = -0.28 * \triangle TRATE10_t - 0.20 * TRENI_t$ *t-values* (5.77) (1.46)	DW = 1.9395	adj. R^2 = 0.69

PRPC	Property/Casualty premiums
PRLH	Life/Health premiums
PRAL	Accident/Health premiums
ENI	Entire net income
CPIMED	Medical care component of CPI
NR2564NY	New York population ages 25 to 64
DCPIMED	Equals first-differenced log of CPIMED from 1993 onward; 0 otherwise
D88	Dummy variable
TRATE10	10-year Treasury rate
TRENI	Tax rate on net income

The growth rates generated from these models are then entered into a simulation model that calculates liability for each taxpayer included in the most recent study file. This approach is subject to significant error, so the results of the model are compared to industry estimates to provide a test against our model results.

State fiscal year net General Fund collections are the sum of taxpayers' payments on current liability, installments on the following year's liability, and adjustments to prior year's estimated liability. As a result, the relationship between a taxpayer's payments on estimated liability and the State's fiscal year net collections is limited by the arbitrary period of the State fiscal year (April 1 through March 31). In addition, the timing of these payments and adjustments to prior estimated liabilities make comparisons between the earnings, tax liability, and actual payments difficult to untangle when estimating future receipts.

For example, based on statutory payment rules, calendar year insurance corporations make a first installment in March based on 30 percent of their prior year's liability effective January 1, 2003. The first installment for life and health companies was increased to 40 percent in 1999. This first installment is captured in one fiscal year, while the subsequent payments on liability are part of the next State fiscal year. As a result, collections growth rates in a period can vary significantly from underlying liability growth rates.

COMPARISON OF GROWTH RATES IN ESTIMATED LIABILITY, FINAL LIABILITY, AND STATE FISCAL YEAR COLLECTIONS

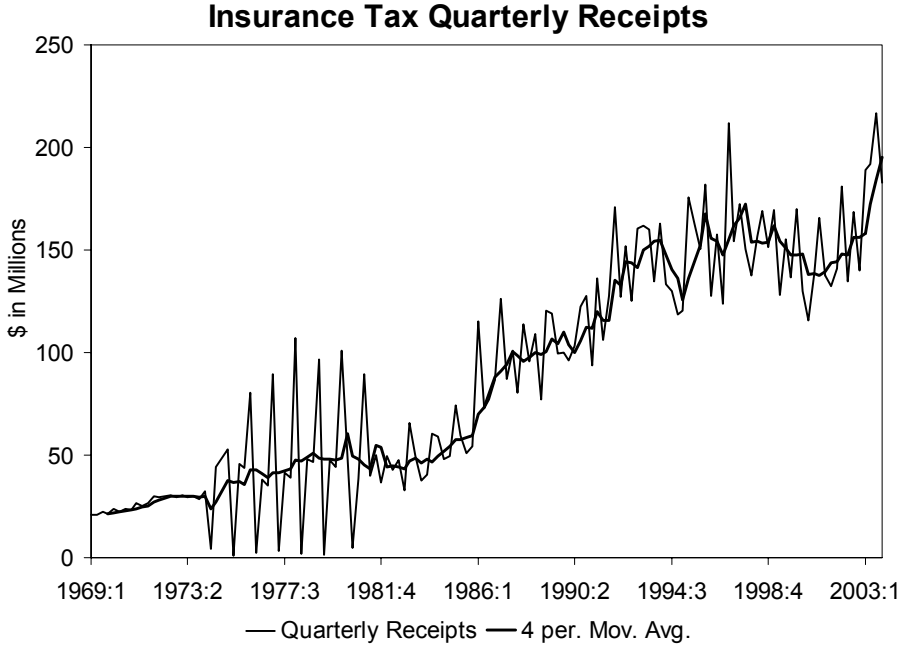
Calendar Year	Estimated Liability Growth Rate[1]	Final Liability Growth Rate[2]	State Fiscal Year	General Fund Net Collections Growth Rate[3]
1989	6.82	5.23	1989-90	0.39
1990	(5.43)	7.75	1990-91	2.29
1991	14.02	22.44	1991-92	10.23
1992	10.47	11.84	1992-93	8.28
1993	4.11	(0.11)	1993-94	4.80
1994	(3.41)	(9.40)	1994-95	(16.64)
1995	20.44	17.46	1995-96	29.23
1996	1.94	(6.90)	1996-97	(4.60)
1997	0.88	(3.33)	1997-98	(1.96)
1998	3.10	(3.61)	1998-99	5.00
1999	(10.65)	(1.25)	1999-2000	(12.45)
2000	7.11	1.39	2000-01	(0.91)
2001 (est.)	(8.99)	NA	2001-02	5.18
2002 (est.)	1.20	NA	2002-03	11.57
2003 (est.)[4]	25.10	NA	2003-04	23.37

1 Estimated liability is the sum of the taxpayers' first installment and the June, September, December, and March payments on current liability.
2 Information from Department of Taxation and Finance Study file.
3 State fiscal year General Fund collections are reported on the Department of Taxation and Finance Monthly Report of Corporation Tax: S-43.
4 Insurance tax law restructuring changes enacted with the 2003-04 Budget affect 2003 calendar year liability and 2003-04 collections.

Cash Receipts

PERCENT DISTRIBUTION OF GENERAL FUND COLLECTIONS

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
1995-96	26.20	24.29	22.44	27.08
1996-97	20.52	25.39	19.93	34.15
1997-98	24.09	26.91	23.49	21.50
1998-99	23.31	24.98	22.54	29.17
1999-2000	19.79	26.37	22.72	31.12
2000-01	24.38	19.04	24.71	31.87
2001-02	24.41	21.31	21.35	32.93
2002-03	22.17	24.15	19.89	33.79
2003-04 (est.)	23.46	24.86	23.04	28.63



Risks to the Forecast

In the Life insurance industry, changes in the demographic and competitive landscape have forced insurers to contend simultaneously with an aging population's need to save for retirement and the ongoing competitive threat from banks and securities brokers. The struggling economy and weak equity market that persisted throughout most of 2003 have intensified many of these challenges.

The Federal tax law changes, such as the Gramm-Leach-Bliley Act of 1999, which permits insurance companies, banks and brokerages to form consolidated companies offering a full range of financial services, has broken down the barriers that once separated the various sectors of the financial services industry. Banks and brokerage houses now sell more annuities than do life insurance agents. Life insurance agents, in turn, now sell investment-oriented products, including mutual funds.

In 2004, property and casualty companies expect a modest upturn in premium rates. However, the industry is facing a threat of costly asbestos claims for which it may be under-reserved. The ultimate liability for asbestos-related losses could approach $200 billion, with the U.S. insurance industry estimating their responsibility at $55 billion to $65 billion of that total.

A continuing significant risk to the forecast would be changes in the factors that impact overall premium growth and the economic performance of industry members. Given industry and economic conditions over the past few years, some companies have withdrawn from certain lines of business, such as homeowners and private passenger automobile. Consolidations in this industry have continued, which reduced some competition and price pressure, allowing companies to increase premium rates. However, in recent months, economic factors have suggested that the economy is recovering from the economic slowdown that began shortly after the September 11, 2001, attacks and that renewed competition in the industry should reduce premium rate growth in 2004 and after.

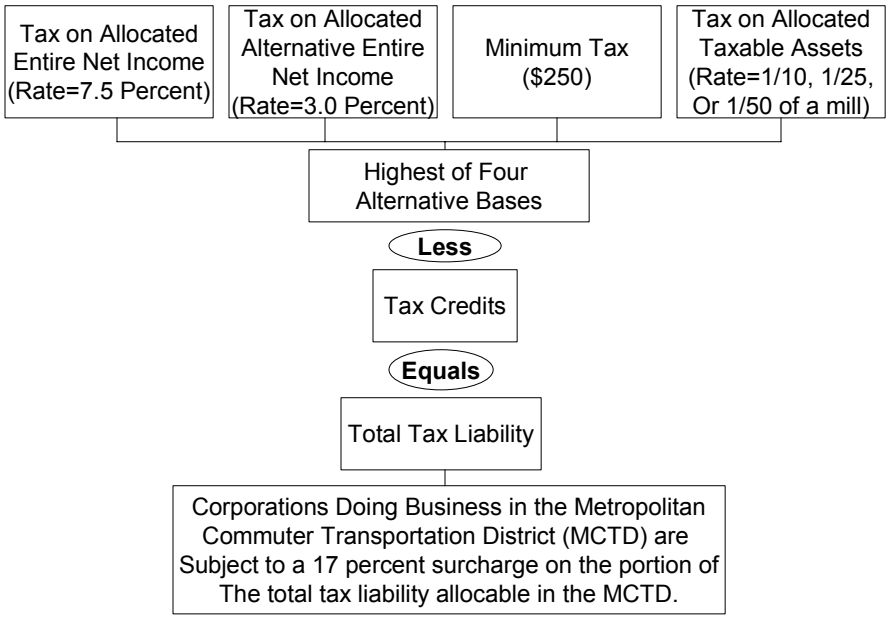
BANK TAX

BACKGROUND

Tax Base and Rate

Article 32 of the Tax Law imposes a franchise tax on banking corporations. Historically, Article 32 receipts have been quite volatile, reflecting statutory and regulatory changes and the variable profit performance of the banking sector. The basic tax rate is 7.5 percent of entire net income with certain exclusions, discussed below. If a greater tax results, either a fixed minimum tax of $250 or one of two alternative taxes applies. The first alternative tax calculation is one-tenth of a mill on each dollar of taxable assets, or the amount of such assets apportioned to this State. For thrift and other institutions where mortgages comprise 33 percent or more of total assets, and where net worth is less than 5 percent of assets, this alternative tax rate is reduced to one-twenty-fifth of a mill; and for such institutions with a net worth of less than 4 percent of assets, one-fiftieth of a mill. The second alternative tax calculation is 3 percent of alternative entire net income, which is net income calculated without regard to certain exclusions.

Computation of Tax Liability
(Current Law)



DATA SOURCES

The major sources of data used in the estimation and forecasting methodology for the bank tax are as follows:

- *S-43, Department of Taxation and Finance Monthly Report of Corporation Tax.* This report, issued by the Office of Tax Policy Analysis (OTPA), provides reconciled monthly collections of bank tax receipts by filing periods.
- *New York State Corporate Tax Statistical Report.* This report is published by OTPA. It includes a detailed summary of bank tax data.
- *Federal Deposit Insurance Corporation.* New York Regional Outlook, Bank Trends, and Statistics on Banking.

- *Value Line Investment Survey.* Bank Industry.
- *Securities and Exchange (SEC) Web Site (http://www.sec.gov).* This web site is monitored for relevant quarterly (10-Q) and annual (10-K) financial reports.
- *Article 32 Bank Tax Study File.* This file is compiled by the Department of Taxation and Finance and includes all corporations filing under Article 32. It includes selected data items from the tax returns of each corporation.

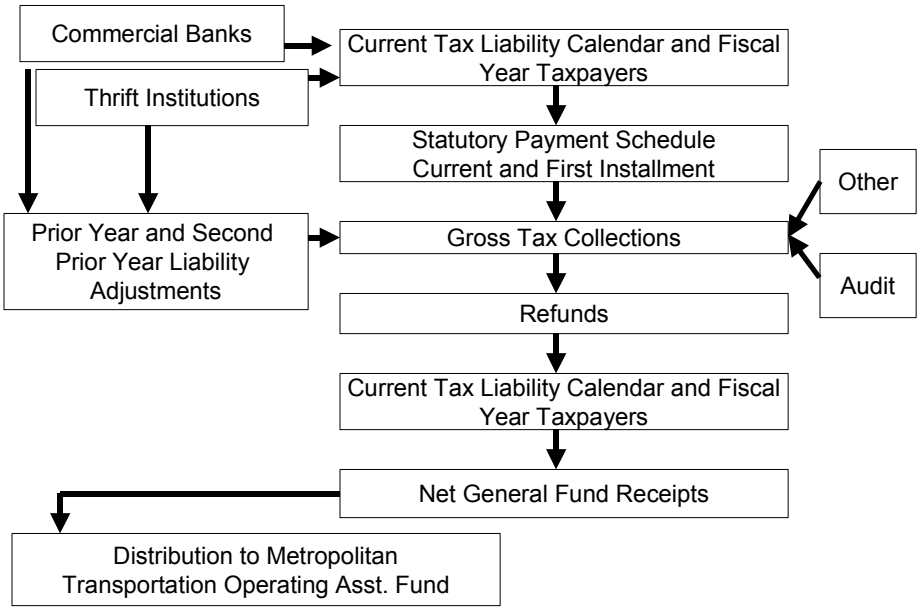
STATUTORY CHANGES

For New York State statutory changes to the bank tax, see *New York State Executive Budget Appendix II*. In 1999, Congress passed the Gramm-Leach-Bliley Act (GLBA). This legislation essentially repealed the Glass-Steagall Act of 1933, which had prohibited certain affiliations between securities, bank, and insurance companies. As a result, legislation was enacted at the State level, first in 2000, and in subsequent years, allowing corporations and banks to maintain their original tax filing status. The Executive Budget proposes to extend the current State GLBA transitional provisions, which expire in 2004, for another two years.

FORECAST METHODOLOGY

The following flowchart highlights the components of Article 32 State fiscal year collections as reported by the New York State Tax Department.

Components of the Bank Tax



The forecast for bank tax collections is driven by a taxpayer's payments on estimated liability. As a result, the forecast methodology begins by constructing a historical liability series for each type of taxpayer. The forecast examines three types of taxpayers: commercial banks, savings institutions, and savings and loan institutions. Based on its Federal tax return, the taxpayer is either a calendar-year or fiscal-year taxpayer.

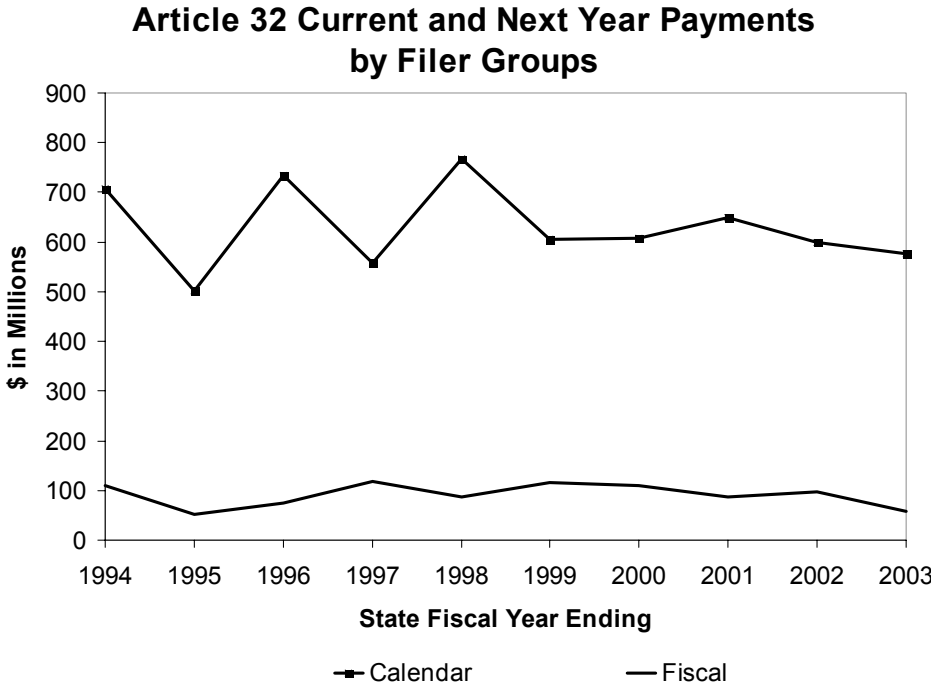
In addition, in any given year, taxpayers make adjustments to estimated liability from prior periods. These adjustments are either credit carry forwards, if the money is used to offset a current liability, or refunds, if the taxpayer has requested that overpayments on prior liability be returned. Both types of prior year adjustments typically place downward pressure on State fiscal year cash collections. The following table highlights the fiscal periods in which banks are making payments during a given State fiscal year.

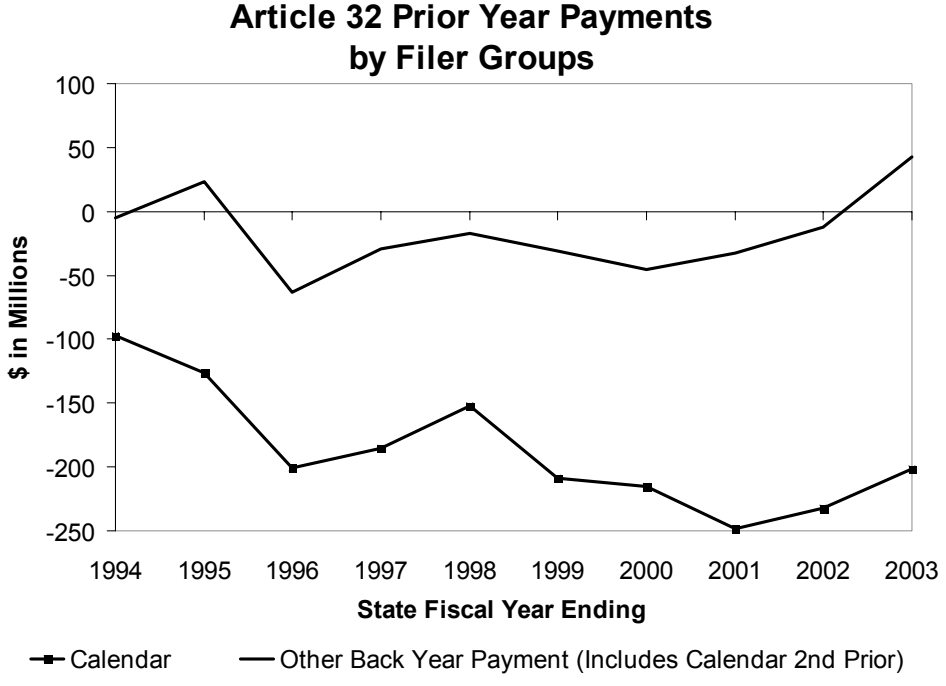
STATE FISCAL YEAR 2002-2003
NET COLLECTIONS BY FISCAL PERIOD
(million of dollars)

	Savings	Savings & Loan	Commercial
Prior Fiscal Year	(1.4)	0.0	(40.9)
Current Fiscal Year	0.0	(0.0)	(2.0)
Next Fiscal Year (1st Installment)	0.1	0.4	60.2
Second Prior Calendar Year	(0.3)	0.0	(52.1)
First Prior Calendar Year	(0.7)	(0.0)	(148.6)
Current Calendar Year	4.7	3.7	402.1
Next Year Calendar (1st Installment)	1.6	1.5	143.7
Other Collections	0.0	0.0	0.0
Prior Years	(0.3)	(0.0)	(16.3)
CARTS (Audits)	1.2	0.1	52.1
Total Net Collections	5.0	6.6	398.4

The table illustrates that calendar-year, commercial bank payments have the greatest influence on State fiscal year net collections. The Division of the Budget (DOB) forecast methodology tracks estimated liability, adjustments to estimated liability, and the first installment on the subsequent tax year. By focusing on the taxpayer's liability and converting this to the State fiscal year, the methodology attempts to establish a link between the underlying economic and financial condition of the banking industry and cash payments.

The following graphs illustrate the increasing impact that adjustments to prior years' liability have on collections during the State fiscal year. The first graph illustrates that while payments on current and next year liability have leveled out in recent years, the second graph shows that the negative adjustments to liability have increased. As a result, to properly estimate cash receipts, predicting the prior year adjustments and payments on current year's liability is necessary.


Article 32 Current and Next Year Payments
by Filer Groups
900
800
700
600
500
400
300
200
100
0
$ in Millions
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
State Fiscal Year Ending
Calendar
Fiscal


Article 32 Prior Year Payments
by Filer Groups
100
50
0
-50
-100
-150
-200
-250
$ in Millions
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
State Fiscal Year Ending
Calendar
Other Back Year Payment (Includes Calendar 2nd Prior)

Outyear Forecast

Two approaches are used to forecast out-year receipts:

- Examining the profit forecasts for large multinational banking corporations with a large presence in New York State.
- Utilizing an econometric model that uses corporate profits to forecast receipts over the forecast period in the budget. Corporate profits appear to have a measure of explanatory power in predicting the path of future receipts. This model operates on the principle that profits and ENI rate changes ultimately determine outyear cash collections with a lag.

PERCENT CHANGE IN KEY VARIABLES
STATE FISCAL YEARS 1998-99 TO 2003-04

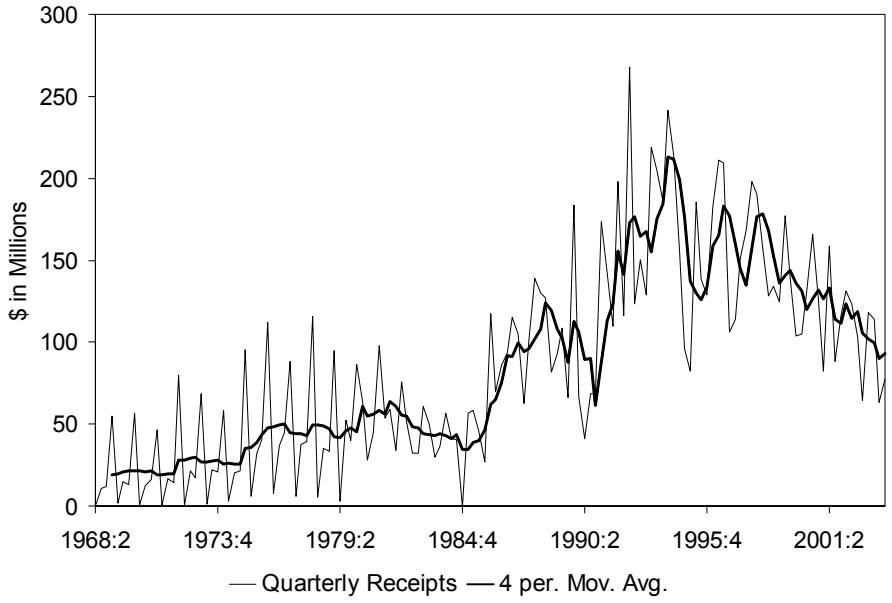
	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04 (Estimated)
Tax Collections*	(23.1)	(3.4)	(3.8)	(1.9)	(17.5)	(5.7)
Corporate Profits**	(7.8)	7.0	(1.9)	(14.0)	(8.7)	25.3
Tax Rates***	9.0	9.0	8.5	8.0	7.5	7.5

* Tax collections also reflect Tax law changes.
** Corporate Profits was adjusted for 2002-03 for Federal depreciation allowances.
*** The tax rate represents the actual tax rate paid under the entire net income base.

Cash Receipts

Historically, bank tax collections have been extremely volatile. (See Receipts graph.)

Bank Tax Quarterly Receipts



Based on statutory payment schedules, banking companies make quarterly payments on estimated liability during March, June, September, and December. The preceding graph highlights the fact that quarterly collections exhibit large swings as taxpayers make adjustments to liability. However, the graph also shows that even when smoothing the series there are still significant year-to-year variations in collections. Again, the saw-tooth pattern evident in the payment pattern of the past few fiscal years shows that collections have been

heavily influenced by payment rules and that links to underlying economic fundamentals are difficult to discern in the cash data. The following table illustrates the distribution of cash collections by quarter during the State fiscal year. We see the quarterly pattern is quite volatile.

PERCENTAGE DISTRIBUTION OF BANK TAX GENERAL FUND COLLECTIONS

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
1995-96	29.22	21.79	20.27	28.72
1996-97	33.01	32.68	16.55	17.76
1997-98	21.35	23.77	27.97	26.91
1998-99	28.97	23.54	24.63	22.87
1999-00	33.72	26.54	19.77	19.97
2000-01	25.99	32.84	24.86	16.31
2001-02	31.95	17.81	25.10	25.15
2002-03	30.22	25.17	15.72	28.90
2003-04 (est.)	29.51	16.35	20.03	34.11

The following table reports estimated liability payments and the first installment where they are converted to a State fiscal year. Beginning January 1, 2003, taxpayers pay a first installment based on 30 percent of the prior year's tax liability, rather than 25 percent. The table illustrates that liability payments on a State fiscal year basis are quite volatile.

CALENDAR YEAR COMMERCIAL BANKS ESTIMATED LIABILITY PAYMENTS DURING THE STATE FISCAL YEAR (millions of dollars)

	Current Year Estimated Liability Payments	Next Year First Installment	Payments on Liability (Current and Next) During the State Fiscal Year	Percent Change
1995-96	588	146	734	47
1996-97	445	112	557	(24)
1997-98	602	166	768	38
1998-99	475	130	605	(21)
1999-2000	487	119	606	(0)
2000-01	539	109	648	7
2001-02	481	119	600	(7)
2002-03	402	144	546	(9)
2003-04 (est.)	399	143	542	(1)

The tables in this section have attempted to demonstrate the relationship between taxpayers' cash payments and underlying liability. For example, State fiscal year 2003-04 current year estimated liability and the next year first installment are computed from a forecast of the taxpayer's 2003 estimated liability and converted to the State fiscal year based on the statutory rules discussed earlier. These relationships are used to estimate current year cash based on historical growth ratios.

Risks to the Forecast

The bank tax forecasts involve, in large part, managing uncertainties, as follow:

- The most significant risk to the forecast comes from the volatile relationship between the economic and liability factors, which ultimately determine cash receipts. These relationships can be significantly altered due to collection patterns and adjustments made to prior year liability.
- Errors in the forecasts of the profits that are used to drive outyear receipts provide an additional risk to the bank tax estimate.

Analyzing industry trends and assessing risks are quite important in adjusting the DOB bank tax forecast.

PETROLEUM BUSINESS TAX

BACKGROUND

Tax Base and Rate

Article 13-A of the Tax Law imposes a privilege tax on petroleum businesses operating in the State, based upon the quantity of various petroleum products imported for sale or use in the State. Petroleum business tax (PBT) rates have two components: (1) the base tax, whose rates vary by product type; and (2) the supplemental tax, which is imposed, in general, at a uniform rate. Both components are indexed to reflect petroleum price changes. Exemptions include sales for export from the State, sales of fuel oil for manufacturing, residential or not-for-profit organization heating use, and sales to governmental entities when such entities buy petroleum for their own use. Sales of kerosene (other than kero-jet fuel), liquefied petroleum gas, and residual fuel oil used as bunker fuel are also exempted.

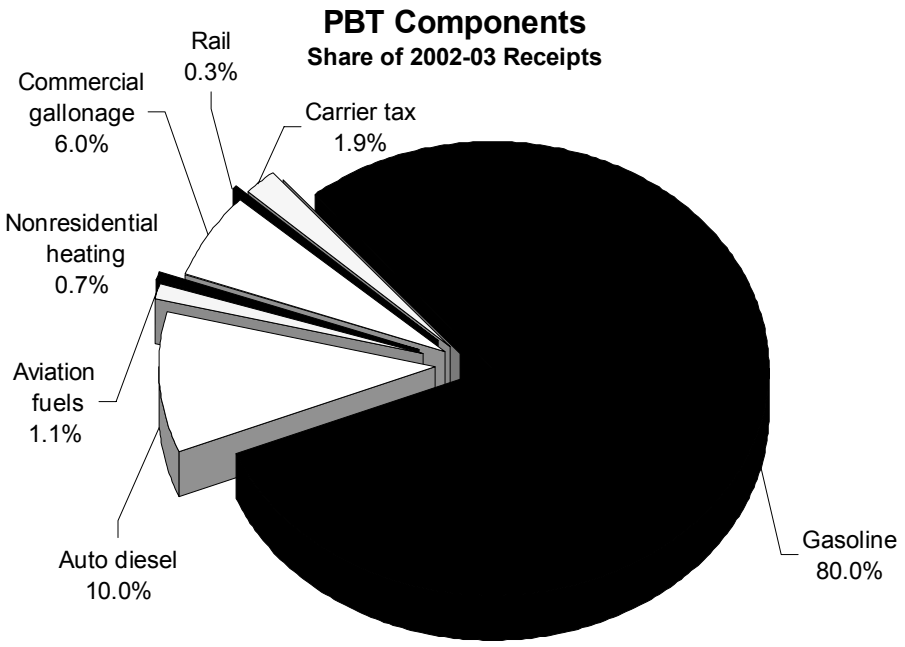
Article 13-A also imposes a petroleum business carrier tax on petroleum products purchased out-of-State but consumed in-State. This is a complement to, and administratively collected with, the fuel use tax portion of the highway use tax.

The following table displays the per gallon PBT rates for 2003 and 2004 and estimated rates for 2005. The 2005 rates reflect anticipated changes due to indexing.

PETROLEUM BUSINESS TAX RATES
(cents per gallon)

Petroleum Products	2003			2004			2005*		
	Base	Supp	Total	Base	Supp	Total	Base	Supp	Total
Automotive fuel									
Gasoline and other non-diesel	8.40	5.60	**14.00**	8.80	5.80	**14.60**	8.60	5.60	**14.20**
Diesel	8.40	3.85	**12.25**	8.80	4.05	**12.85**	8.60	3.85	**12.45**
Aviation gasoline	8.40	5.60	**14.00**	8.80	5.80	**14.60**	8.60	5.60	**14.20**
Net rate after credit	5.60	none	**5.60**	5.80	none	**5.80**	5.60	none	**5.60**
Kero-jet fuel	5.60	none	**5.60**	5.80	none	**5.80**	5.60	none	**5.60**
Nonautomotive diesel fuels	7.60	5.60	**13.20**	7.90	5.80	**13.70**	7.70	5.60	**13.30**
Commercial gallonage after credit	7.60	none	**7.60**	7.90	none	**7.90**	7.70	none	**7.70**
Nonresidential heating	4.10	none	**4.10**	4.30	none	**4.30**	4.20	none	**4.20**
Residual petroleum products	5.80	5.60	**11.40**	6.00	5.80	**11.80**	5.80	5.60	**11.40**
Commercial gallonage after credit	5.80	none	**5.80**	6.00	none	**6.00**	5.80	none	**5.80**
Nonresidential heating	3.10	none	**3.10**	3.20	none	**3.20**	3.10	none	**3.10**
Railroad diesel fuel	8.40	3.85	**12.25**	8.80	4.05	**12.85**	8.60	3.85	**12.45**
Net rate after exemption/refund	7.10	none	**7.10**	7.50	none	**7.50**	7.30	none	**7.30**

* Projected — A fuel price decrease of 2.7 percent through August 2004 will result in a decrease of 2.7 percent in the PBT rates on January 1, 2005.



Administration

The tax is collected monthly along with State motor fuel taxes. Imposition of the tax occurs at different points in the distribution chain, depending upon the type of product. Gasoline, which represents the preponderance of automotive fuel sales in the State, is taxed upon importation into the State for sale or upon manufacture in the State. Other non-diesel fuels such as compressed natural gas, methanol and ethanol become subject to the tax on their first sale as motor fuel in the State. Automotive diesel motor fuel is taxed upon its first non-exempt sale or use in the State. Non-automotive diesel fuel (such as #2 fuel oil used for commercial heating) and residual fuel usually become taxable upon the first taxable sale to the consumer or use of the product in the State.

DATA SOURCES

The primary sources of data used in the estimation and forecasting methodology for the petroleum business tax are as follows:

- *RS-43, Department of Taxation and Finance Monthly Report of Receipts.* This report contains gross and net receipts data for gasoline and diesel tax receipts.
- *Gasoline and Petroleum Business Tax Monthly Statistical Report, Department of Taxation and Finance.* This report contains monthly gallonage data for gasoline, diesel and other PBT fuels.
- *United States Energy Information Administration.* Various publications, including *the Short Term Energy Outlook, Petroleum Marketing Monthly and Annual Energy* and *Motor Gasoline Watch,* contain useful information. Available on the Internet at http://www.eia.doe.gov.
- *Various U.S. and New York government agencies, including the U.S. Bureau of Economic Analysis of the Commerce Department.* These agencies provide economic data used to develop gasoline, diesel and other fuels consumption forecasts.

STATUTORY CHANGES

Since 1983, the State has substantially changed its taxation of petroleum businesses. These revisions altered collection mechanisms, modified tax bases, and increased the level of taxation. The most significant changes occurred in 1990 with the restructuring of a gross receipts tax to a cents-per-gallon tax and the indexing of the tax rates to maintain price sensitivity. Full-year revenue history under the gallonage-based PBT, therefore, only exists starting with State fiscal year 1991-92. Full-year collections of both the basic PBT and the supplemental PBT began in State fiscal year 1992-93.

Major legislative changes under the PBT since 1994-95 are listed as follows:

- Legislation in 1995 eliminated the supplemental tax imposed on aviation gasoline and kero-jet fuel and reduced the base tax rate for those products;
- Legislation in 1996 provided a full exemption from the supplemental tax on commercial gallons, expanded to a full exemption on fuels used for manufacturing, and reduced the supplemental tax on diesel fuel by 1.75 cents per gallon;
- Legislation in 1999 reduced the tax rate on commercial heating by 20 percent; and
- Legislation in 2000 further reduced the tax rate on commercial heating by 33 percent.

FORECAST METHODOLOGY

Forecasting PBT revenue is a two-step process. First, a forecast of demand (gallons) is produced from annual (fiscal year) data and the various tax rates, adjusted for indexing, for different petroleum products are applied. Second, various adjustments are made to arrive at the forecast of cash collections, since a direct relationship does not exist between reported gallonage and cash collections. Both of these steps are discussed below.

Gallonage

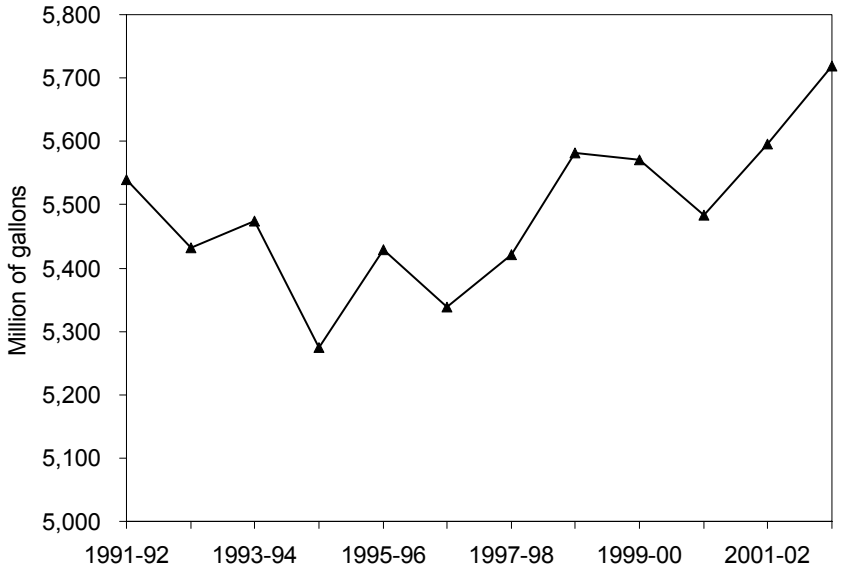
Gasoline

The estimate of gasoline consumption for the PBT is derived in the same manner as for the motor fuel tax. The Energy Information Administration (EIA) has reported estimated relationships between changes in real gross domestic product (GDP), national fuel prices and national gasoline demand. They estimate that a 1 percent increase in real GDP will raise gasoline demand by 0.1 percent, and a 10 percent increase in fuel prices will decrease demand by 0.3 percent. To derive a State level forecast, real New York disposable income growth is substituted for GDP.

PERCENT CHANGE IN EXOGENOUS VARIABLES

	Real NY Disposable Income	Gasoline Price
1995-96	2.1	0.6
1996-97	1.9	7.8
1997-98	2.4	(5.0)
1998-99	4.2	(12.4)
1999-2000	0.9	21.7
2000-01	4.1	18.6
2001-02	(0.1)	(9.3)
2002-03	3.0	5.7
2003-04 (est.)	3.1	8.2

PBT Gasoline Consumption



Diesel

The estimate of automotive diesel consumption for the PBT is derived in the same manner as for the motor fuel tax. Consumption of diesel fuel is forecast with a simple econometric model relating consumption to a broad measure of economic activity. The dependent variable is the number of gallons of diesel taxed in New York State. The explanatory variable is real GDP. The model was most recently estimated with 115 observations of quarterly data (1975:1 to 2003:3). A dummy variable is used to isolate the impact of changes in tax remittance procedures in State fiscal year 1988-89. A quarterly dummy variable is used to reflect seasonal consumption patterns. The equation is estimated in log form and is corrected for first-order serial correlation. The estimated equation, with t-statistics in parentheses, is as follows:

DIESEL CONSUMPTION MODEL

$$\text{Log(Diesel gallons}_t) = \underset{}{6.75} + \underset{(24.76)}{1.37}\ \text{log(GDPreal}_t) + \underset{(9.66)}{0.63}\ \text{Dummy}_t - \underset{(-6.74)}{0.10}\ \text{Dqt1}_t + u_t$$
$$\text{(13.95)}$$

$$u_t = \underset{(-5.36)}{-.33} * u_{t-1}$$

R-Bar Squared	0.9541
Durbin-Watson Statistic	2.0013
Root Mean Squared Error	0.0845
Number of Observations	115

Utility Residual Fuels

Residual fuels are burned by electric utilities to produce electricity. They can switch to natural gas (which is not subject to the PBT) depending upon relative prices and State regulatory policy, which requires utilities to burn residual fuels during times of high residential demand for natural gas.

Rates/Indexing

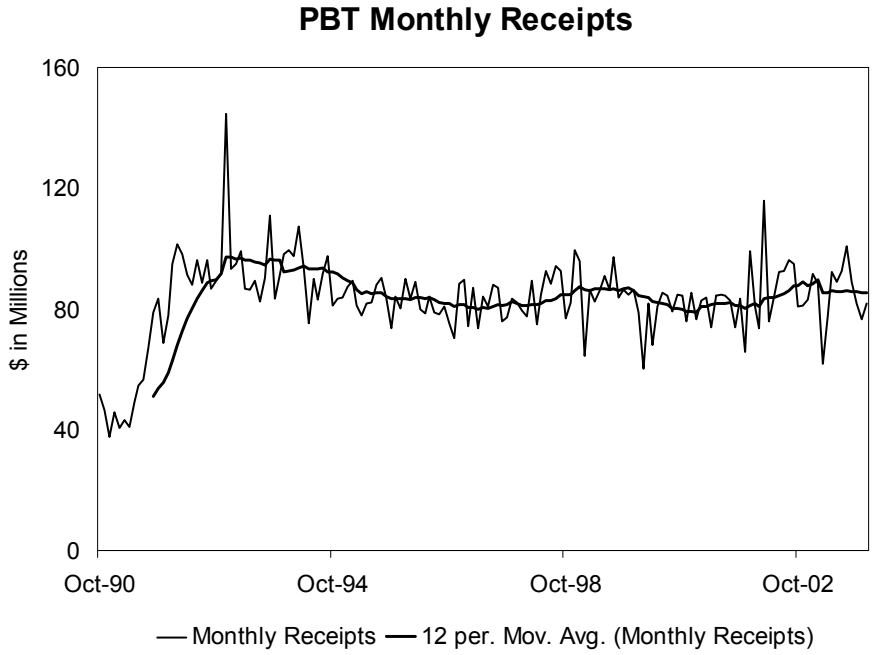
Since 1990, basic and supplemental PBT tax rates have been subject to separately computed annual adjustments on January 1 of each year to reflect the change in the Producer Price Index for refined petroleum products for the 12 months ending August 31 of the immediately preceding year. The tax rates, therefore, increase as prices rise and decrease as prices fall. The monthly history of the Producer Price Index for refined petroleum products is published by the Bureau of Labor Statistics of the United States Department of Labor. The Division of the Budget forecasts the index based on historical data. Beginning January 1, 1996, PBT rates have been adjusted annually subject to a maximum change of 5 percent of the current rate in any year. As a result, PBT rates decreased by 5 percent on January 1, 2003, and increased by 5 percent on January 1, 2004. The index for January 1, 2005, is projected to decrease by 2.7 percent, triggering a tax rate decrease of 2.7 percent for 2005.

It should be noted that, in general, the statute also requires the base and the supplemental gasoline rates to be rounded to the nearest tenth of one cent. As a result, the actual increases or decreases in the rates from indexing are usually slightly different than the full percentage change dictated by the statutory formula. Rates are also affected by statutory changes that may complement or offset the changes due to indexing.

Adjustments

After generating a demand forecast and applying the appropriate tax rates, adjustments are made for refunds, credits, pay schedule lags, accounting delays, historical and year-to-date collection patterns, tax law changes, tax evasion and Federal and State enforcement measures.

Cash Receipts



PERCENTAGE DISTRIBUTION OF CASH RECEIPTS

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
1995-96	24.1	26.0	23.7	26.2
1996-97	25.1	24.7	24.2	26.0
1997-98	24.4	25.6	24.8	25.2
1998-99	24.5	26.6	25.0	23.9
1999-2000	25.8	26.6	25.6	22.0
2000-01	24.4	25.4	25.2	25.0
2001-02	24.2	24.1	24.8	26.9
2002-03	24.7	27.7	24.0	23.6
2003-04 (est.)	25.3	27.5	23.5	23.7

Risks to the Forecast

Historically, PBT receipts have remained relatively stable under a wide variety of political and economic conditions. However, due to the difficulty in predicting fuel prices, inventories, and weather conditions, the current PBT revenue estimate has some inherent risks. Among these risks, the variation of fuel prices is the most noteworthy. Global economic and political conditions, as well as market forces, can affect fuel prices. For example, between January 1999 and October 1999, the world crude oil price increased by 116 percent. Changes in fuel prices may change fuel consumption, especially residual fuel consumption. The growth rate of utility residual fuel consumption exhibited volatility during the last five years ranging from -43 percent to 77 percent. Fuel price changes may also change fuel inventories, the PBT index, and tax rates. Fortunately, the portions of the PBT most affected by price changes comprise a small portion of overall receipts.

ESTATE TAX

BACKGROUND

Tax Base and Rate

New York imposes a tax on estates of deceased New York residents, and on that part of a nonresident's net estate made up of real and tangible personal property located within New York State. The tax applies to that portion of the estate in excess of any taxable gifts already made. Until February 1, 2000, the tax had progressive rates, ranging from 2 percent of the first $50,000 of net taxable transfers to 21 percent of net taxable transfers in excess of $10.1 million. For those dying on or after October 1, 1998, and before February 1, 2000, a non-refundable unified tax credit of $10,000 eliminated the State estate tax for estates valued up to $300,000.

After February 1, 2000, the estate tax will be equal to the Federal credit allowable for State death taxes paid. New York also automatically conformed State law to the unified credit provisions specified in Federal law, but capped the maximum credit to exempt the first $1 million in the taxable value of an estate. In February 2000, Federal law set the unified credit at $675,000 and contained a schedule that increased the credit to $1 million by 2006. (See table below.) In addition, consistent with Federal law, 100 percent of tax liability is due within nine months of the decedent's death.

Estates of decedents dying after 2004 will be subject to a graduated rate structure with tax rates that range from 0.8 percent on adjusted taxable estates in excess of $40,000 but less than $90,000, and up to 16 percent on adjusted taxable estates of $10,040,000 or more.

Current Federal law converted the old unified credit to an exemption and will continue to increase the value of the exemption until it reaches $3.5 million in 2009. As reported, State law capped the exemption at $1 million, effective in 2002. (See table below.)

STATE UNIFIED CREDIT/EXEMPTION AMOUNTS
(thousands of dollars)

Year	Prior to 2001 Federal Tax Reduction Program	After 2001 Federal Tax Reduction Program
2000, 2001	675,000	675,000
2002, 2003	700,000	1,000,000
2004	850,000	1,000,000 [1]
2005	950,000	1,000,000 [1]
2006 and thereafter	1,000,000	1,000,000 [1]

[1] New York State law caps the unified exemption set in Federal law at $1 million. The Federal law increases the amount to $1.5 million in 2004 and 2005; $2 million in 2006, 2007, and 2008; and $3.5 million in 2009.

In addition, the Federal law phases out the Federal credit for state death taxes over four years, by 25 percent per year. The credit will be repealed for the estates of decedents dying after 2004. In 2005, it will become a deduction until the phase-out of the Federal estate tax in 2010. The provisions of New York's law setting the estate tax liability equal to the Federal credit for state death taxes conforms to the Federal law as it existed on July 22, 1998. As a result, New York estate tax liability will be unaffected by the phase-out of the Federal credit for state death taxes.

Administration

The estate tax is due on or before the date fixed for filing the return. To avoid interest charges, payment must be made within nine months after the date of death. The Commissioner of Taxation and Finance may grant an extension of 12 months from the date fixed for payment and, in extreme cases, may extend the time of payment to four years from the date of death.

DATA SOURCES

The primary sources of data used in the estimation and forecasting of the estate tax are as follows:

- *Monthly estate tax receipts from the Department of Taxation and Finance on report AM043.*
- *Monthly estate tax receipts from the State of New York Office of the State Comptroller.*
- *New York State Estate Tax, Analysis of Final Returns OTPA.*
- *Daily Collections OTPA.*
- *Various U.S. and New York government agencies, including the U.S. Bureau of Economic Analysis of the Commerce Department.*

STATUTORY CHANGES

Legislation enacted in 1990 modernized the administration of the estate tax, imposed a State generation-skipping transfer tax, and revised the method for computing liability.

Legislation enacted in 1991 increased the estimated estate tax payable within six months of the date of death from 80 percent to 90 percent, with the balance of the tax due payable within nine months of the date of death.

Legislation enacted in 1994 provided a special estate tax credit of 5 percent of the first $15 million of qualified assets for estates consisting of small business interest, and increased the maximum unified credit allowed against State estate tax liability from $2,750 to $2,950.

Legislation enacted in 1995 protects the value of a decedent's principal residence from estate tax liability. A maximum of $250,000 of equity in the decedent's principal residence may be deducted from the value of the New York gross estate. This special deduction reduces the tax burden of transferring family homes, particularly those which are the primary asset of the estate.

Legislation enacted in 1997 significantly reduced State estate tax collections and changed the way the New York State estate tax is imposed. In two steps, the State's estate tax rate structure, credits and exemptions were eliminated and, instead, the State will only receive an amount equal to the maximum Federal credit for state death taxes (the "pick-up tax").

The first phase of the estate tax legislation increased the amount of the tax credit from $2,950 to $10,000. In addition, the provision requiring 90 percent of the estate tax to be paid within six months of death to avoid underpayment interest was changed to allow seven months.

In the second phase, for those dying on or after February 1, 2000, the estate tax was converted to a "pick-up tax", and the requirement for 90 percent of the estate tax to be paid within seven months of death to avoid underpayment interest was changed to allow nine months for payment of total liability, which is consistent with Federal law.

The enacted legislation will also conform with increases in Federal unified credit and gradually increase the State's unified credit to exempt taxable estates of up to $1 million.

On March 23, 2001, the Federal estate law was amended to repeal the tax over a ten-year period. The unified credit was converted to an exemption and New York State automatically conforms up to $1 million. The Federal credit for state death tax is reduced by 25 percent per year beginning in 2002 and is eliminated in 2005 (New York does not automatically conform to the change). The New York estate tax is imposed pursuant to the Internal Revenue Code of July 22, 1998; therefore, New York residents will generally not be affected by any changes to Federal statute after that date.

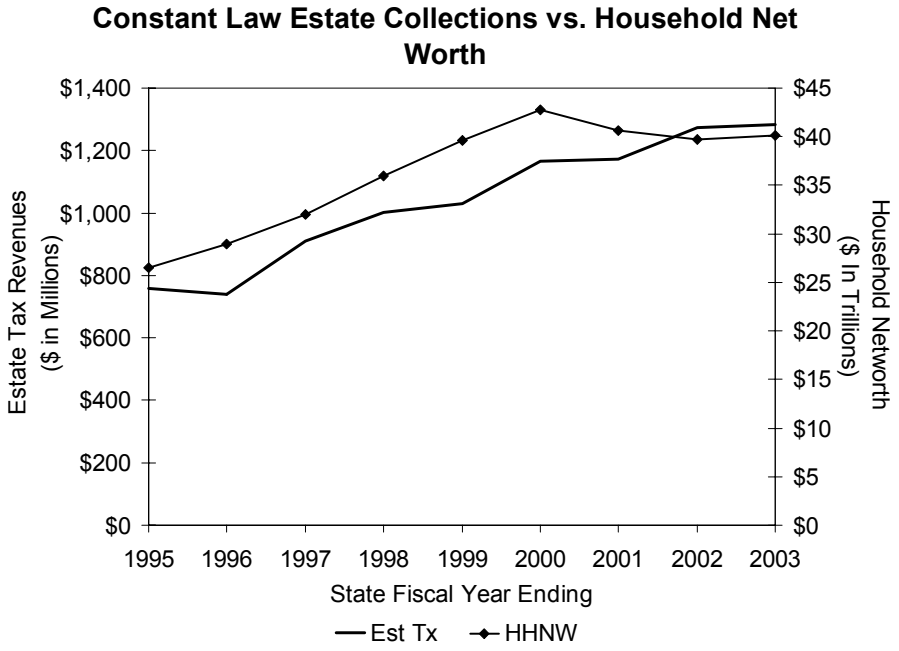
FORECASTING METHODOLOGY

Economic variables alone cannot explain variances in revenues from this source. Not only is it difficult to forecast wealthy taxpayer mortality, it is also difficult to forecast the taxability of the decedent's estate. To the extent that the estate is left to a spouse, or to a charitable trust, there is no liability. In addition, less than one-half of one percent of estates account for over 51 percent of the tax liability. The number of estates required to pay the tax has also declined over time, in part because of the change to a "pick-up tax", the conversion of the unified credit to an exemption and its increase from $700,000 to $1 million on January 1, 2002. While a model (see below) using household assets and stock market indicators fits the payment data for the smaller estates, the value of new Federal exemptions and the rapidly increasing unified credit complicate the estimate. In projecting current year receipts, an analysis of historical trends supplements the econometric analysis.

Econometric and Statistical Analysis

For purposes of projecting estate taxes, collections are separated into categories of super large (tax payment exceeds $25 million), extra large (tax payment exceeds $4 million but less than $25 million), large estate (tax payment exceeds $500,000 but less than $4 million), and small estates ($500,000 or less). To forecast collections in the super- and extra-large categories; the number of super-large and extra-large estates over the last 14 years are fitted to a statistical distribution. This distribution is then used to predict the number of super- and extra-large filers in future fiscal years. The same method is applied to the average real payment in each category. Once the predicted number of estates is multiplied by the average payment, an inflation factor, based on household net worth, is applied to determine the nominal growth rate of the taxable base.

For the remainder of estate tax payments, a regression equation is estimated with quarterly collections as the dependent variable. The main independent variable is a measure of household net worth which proxies for the value of the estates. The measure uses household net worth at the minimum of the value at time of death or its value nine months later. This corresponds to the valuation methodology in State statute. The revenue elasticity with respect to household net worth measured over the last five years of data is 0.7.



	2000-01	2001-02	2002-03	2003-04
Min. Household Net Worth (percent change)	(4.3)	(4.8)	(4.0)	6.2
Total Collections (millions)	717.1	761.4	700.9	747.4
Impact of Law Change	(330.0)	(392.5)	(428.4)	(483.3)
Average Revenue Elasticity[1]	0.7	0.7	0.7	0.8

[1]This elasticity is derived using the last five years of annual fiscal year data and taking the average of endogenous and exogenous variables. Then, one calculates the percent change in the endogenous variable resulting from a 1 percent change in the exogenous variable.

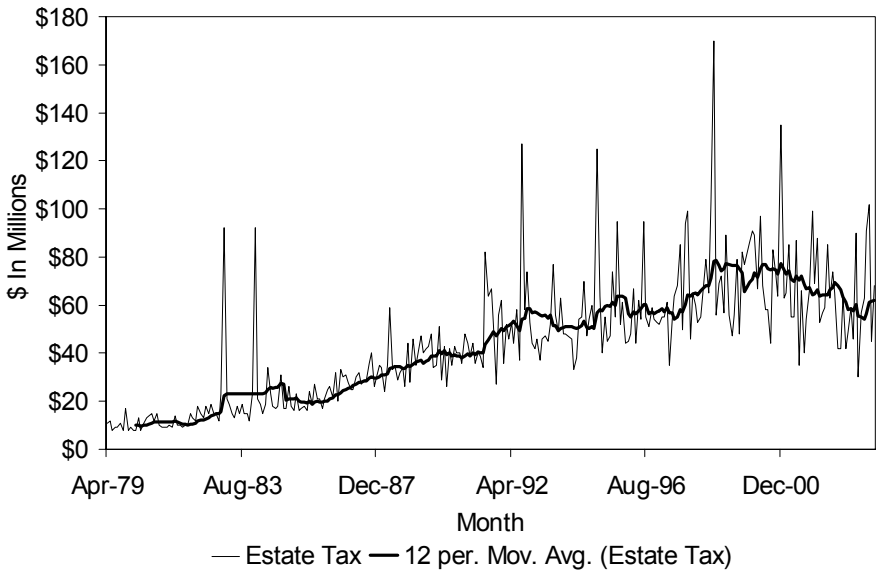
Revenue History

ESTATE TAX RECEIPTS
STATE FISCAL YEAR ENDING MARCH 31
(millions of dollars)

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004 (Estimated)
No. of Estates	20,960	20,869	20,252	18,704	20,946	20,760	18,205	12,505	6,242	4,484	4,260
Actual Receipts	720	696	679	792	919	946	975	717	761	701	747
Constant Law Receipts	761	758	738	909	1,001	1,029	1,165	1,174	1,274	1,266	1,368
Growth %	(7.2)	.04	(2.6)	23.1	10.1	2.8	13.2	0.7	8.5	(0.6)	8.0
Small Estate[1]	393	401	416	397	407	465	461	332	313	262	257
Large Estate	164	153	158	152	195	259	229	225	209	248	172
Super/ Extra-Large Estates	163	142	105	243	317	222	285	160	239	191	318

[1] Estimated small estates includes CARTS and all refunds are subtracted from small estates.

Estate Tax Monthly Receipts



PERCENTAGE DISTRIBUTION OF GENERAL FUND COLLECTIONS

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
1995-96	30.1	24.1	23.6	22.2
1996-97	23.5	28.8	26.5	21.2
1997-98	26.9	32.1	23.6	17.4
1998-99	22.1	31.8	26.7	19.4
1999-00	20.5	26.8	27.2	25.5
2000-01	32.9	25.5	21.8	19.8
2001-02	25.7	18.3	28.6	27.4
2002-03	28.6	28.8	21.1	21.4
2003-04 (est.)	22.3	28.2	28.8	20.7

REAL ESTATE TRANSFER TAX

BACKGROUND

Tax Base and Rate

The New York State real estate transfer tax (RETT) is imposed on each conveyance of real property or interest therein when the consideration exceeds $500, at a rate of $4.00 per $1,000 of consideration. The tax became effective August 1, 1968. Prior to May 1983, the rate was $1.10 per $1,000 of consideration. An additional "mansion" tax, effective July 1, 1989, is imposed on conveyances of residential real property for which the consideration is $1 million or more at a rate of one percent of the consideration attributable to residential property.

The tax rate imposed on conveyances into new or existing real estate investment trusts (REITS) is $2.00 per $1,000 of consideration.

For deeded transfers, the tax is paid to a recording agent (generally the county clerk). For non-deeded transactions, payments are made directly to the Commissioner of the Department of Taxation and Finance. All payments are due within 15 days of the transfer. For counties that had more than $1.2 million in liability during the previous calendar year, payments received between the first and fifteenth day of the month are due to the Commissioner by the twenty-fifth day of the same month. Payments received in such counties between the sixteenth and final day of the month are due to the Commissioner by the tenth day of the following month. Payments from all other counties are due to the commissioner by the tenth day of the month following their receipt.

In the State fiscal year 2001-02, there were 479,393 conveyances, which generated $315 million in RETT (excluding mansion tax) liability. About 0.5 percent (2,326) of these were residential conveyances that involved consideration of $1 million or more and generated $69 million in mansion tax liability. Refunds and CARTS are insignificant.

DATA SOURCES

The primary sources of data used in the estimation and forecasting methodology for the RETT are as follows:

- *RS-43*, *Department of Taxation and Finance Monthly Report of Receipts*. This report contains gross and net receipts data.
- *RETT 7, Department of Taxation and Finance.* This form reports the monthly liability for each county. It is an important source of information since some counties do not remit payments to the Commissioner according to the statutory schedule.
- *Various U.S. and New York government agencies, including the U.S. Bureau of Economic Analysis of the Commerce Department.* These agencies provide economic data used in the econometric equation.

FORECAST METHODOLOGY

A regression equation is estimated with fiscal year liability (excluding the mansion tax) divided by the tax rate, which yields the dollar value of transfers, as the dependent variable. Independent variables in the model are: the mortgage rate, New York housing starts multiplied by an average New York housing price which yields a "value of sold housing" variable, Manhattan vacancy rates, and the national price deflator for nonresidential construction (buildings and other). Mansion tax receipts are estimated using a separate equation, in which the S&P 500 index is the primary independent variable. A dummy

captures the large increase in collections in SFY 2001-02. The typical payment behavior of all counties is then used to estimate State cash receipts. As the fiscal year progresses, year-to-date collections and liability are additional factors that determine the current-year estimate.

RETT (NON-MANSION TAX EQUATION)

Dollar Value of Transfers = -4450 - 1706*[mortgage rate] + 3.308*[value of sold housing] +
(-1.29) (-6.0) (10.51)
58417*[U.S. construction deflator, buildings] - 9.22*[square of Manhattan vacancy rates]
(16.61) (-5.6)

R-Bar Squared	0.984
Durbin-Watson Statistic	1.9514
Standard Error of the Regression	$7.0 million
Number of Observations	33

Mansion Tax Receipts = -1.598+ .032616*[S&P 500 index] + 46.23*[Dummy for SFY 2001 Increase]
(-0.92) (14.26) (-7.56)

R-Bar Squared	0.984
Durbin-Watson Statistic	2.0138
Standard Error of the Regression	$5.9 million
Number of Observations	13

PERCENT CHANGE IN EXOGENOUS VARIABLES
STATE FISCAL YEARS 1998-99 TO 2003-04

Exogenous Variable	1998-99	1999-2000	2000-01	2001-02	2002-03	2003-04 (Estimated)
Mortgage rate (level)	7.0	7.6	7.8	7.0	6.4	5.8
Value of sold housing	16.8	19.5	14.1	23.8	16.1	9.2
U.S. construction deflator, buildings	3.7	4.3	4.2	3.6	5.5	2.5
Square of Manhattan vac. rates (level)	165.1	115.6	35.7	291.6	515.3	576.0
S&P 500 index	22.8	19.5	1.8	(16.9)	(19.7)	9.8

ELASTICITIES

Exogenous Variable	Revenue Elasticity - Last Five Years*
Mortgage rate (level)	(.21)
Value of sold housing	.30
U.S. Construction deflator, buildings	1.0
Square of Manhattan vac. rates (level)	(.05)
S&P 500 index	0.94

* Using last five years of annual fiscal year data, take the average of endogenous and exogenous variables. Calculate percent change in endogenous variable resulting from a one percent change in exogenous variable.

Recent Experience

As previously noted, actual State cash collections are dependent upon county payment behavior, particularly the counties comprising New York City and Long Island. Although the county payment schedule is statutory, there is no penalty for late payment. This becomes an important factor when the State closes its fiscal year. The closeout date (the last day receipts are attributed to the current fiscal year) for the real estate transfer tax is approximately March 25. Although these counties have payments due on the twenty-fifth of each month, payment by this date is rare. Typically, though not always, the Long Island counties make this payment between the twenty-fifth and final day of the month (at the end of the State's fiscal year; this payment is therefore attributed to the following fiscal year), and except for Richmond County, New York City counties pay sometime during the following two months.

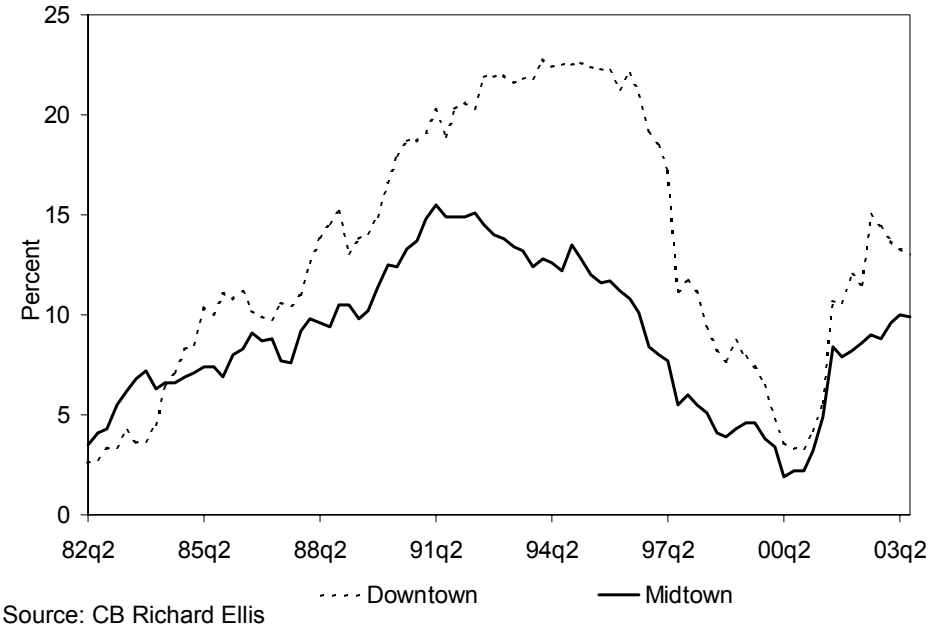
Real estate transfer tax collections are dependent on the total value of real estate conveyances, which in turn are a function of the number of conveyances and the price of each individual conveyance. Between fifty percent and sixty percent of monthly collections are the result of activity in New York City and Long Island. Real estate values and the number of transfers in this geographical area are subject to more cyclical behavior than in the remainder of the State. This is due to the nature of the local economy, which is more dependent on financial services than the remainder of the State and the nation as a whole, and to the sometimes speculative nature of expected returns on commercial real estate transactions.

During State fiscal year 2002-03, collections were driven by strong residential demand. Collections were restrained somewhat by the decline in demand for office space in New York City.

Risks to the Forecast

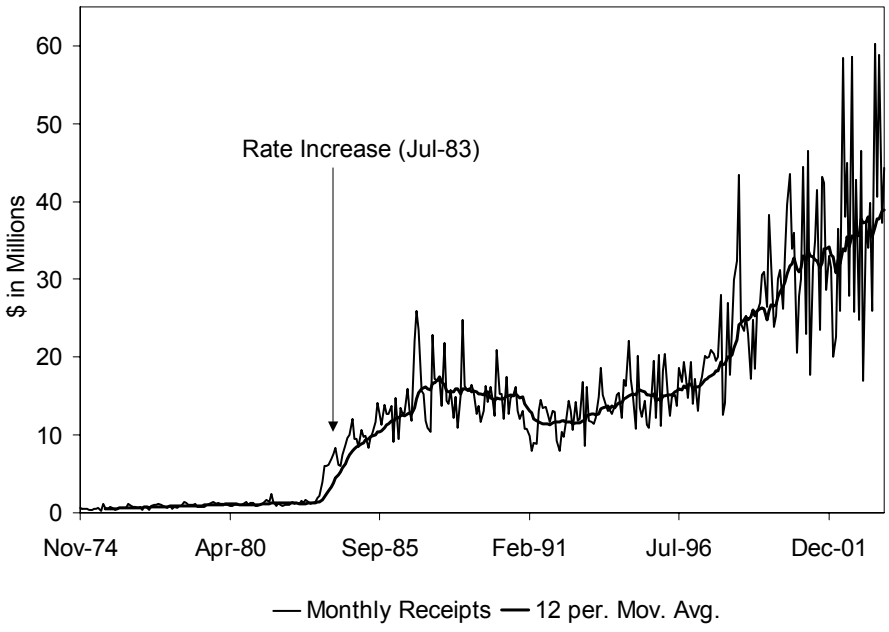
Errors in the forecasts of the exogenous variables provide a degree of risk to the real estate transfer tax forecast. Forecast error in prior years can largely be attributed to the forecasts of the exogenous variables and large unanticipated transfers. Variation in the estimate may also occur as a result of administrative changes or unanticipated legislative action.

Manhattan Commercial Vacancy Rates



Source: CB Richard Ellis

RETT Monthly Receipts



PERCENTAGE DISTRIBUTION OF CASH RECEIPTS

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
1995-96	20.2	26.1	27.3	26.4
1996-97	22.5	28.3	26.5	22.7
1997-98	23.5	26.6	26.1	23.8
1998-99	21.9	33.9	23.4	20.8
1999-2000	21.0	25.8	27.8	25.4
2000-01	24.5	28.0	19.4	28.1
2001-02	22.7	29.2	28.1	20.0
2002-03	27.0	24.8	27.6	20.6
2003-04 (est.)	24.7	28.2	31.2	16.0

PARI-MUTUEL TAXES

BACKGROUND

Tax Base and Rate

The pari-mutuel tax has been levied, since 1940, on pari-mutuel wagering activity conducted first at horse racetracks and later at simulcast theaters and off-track betting (OTB) parlors throughout the State. Each racing association or corporation pays the State a portion of the commission (the "takeout") withheld from wagering pools (the "handle") as a tax for the privilege of conducting pari-mutuel wagering on horse races.

In general, the tax varies based on the type of racing (thoroughbred or harness), the place where the bet is made (on-track or off-track), and the type of wager (regular, multiple, or exotic). Currently, all tracks, other than the New York Racing Association (NYRA) tracks of Aqueduct, Belmont, and Saratoga, have an effective tax rate of 0.5 percent on all bets. NYRA has a flat tax rate of 1.6 percent, and off-track betting corporations have an effective tax rate of 0.94 percent.

In the 1980's, the on-track harness handle was over $850 million and the effective tax rate was over 8 percent. Currently, the handle is less than $250 million and the tax rate is 0.5 percent, providing taxes of $1.0 million. Similarly, the on-track thoroughbred racing handle has fallen from over $800 million to less than $600 million, and its effective tax rate from over 9 percent to less than 2 percent. Off-track betting, which started in 1972, had rapid growth in the 1970s and 1980s, as new facilities came on line and the State increased the hours of operation and types of betting. Over this period, the OTB handle has grown to $2 billion, but its effective tax rate was reduced from over 3 percent to .94 percent by 2000.

Administration

The tax is collected by each on-track and off-track racing association, or corporation, and remitted to the State Commissioner of Taxation and Finance each month on the last business day. Such taxes cover the liability due for the period from the 16th day of the preceding month through the 15th day of the current month.

DATA SOURCES

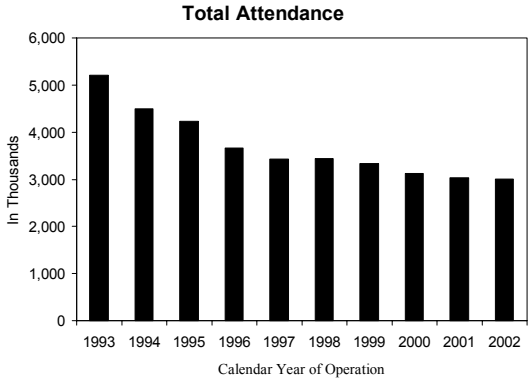
Data on the pari-mutuel tax come from various sources:

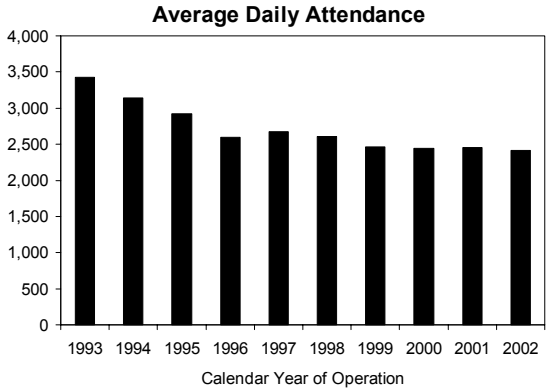
- *Department of Taxation and Finance.* Daily and monthly collection reports are received, compiled and analyzed.
- *OTB and Racetracks.* Monthly reports are collected from OTB, and various racetracks provide data upon request.
- *New York State Racing and Wagering Board.* The Board provides annual reports and additional information upon request.
- *Office of the State Comptroller.* Monthly collections reports are received and analyzed.

STATUTORY CHANGES

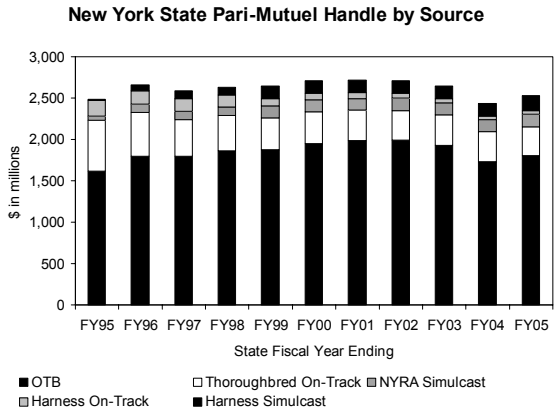
The rise in OTB activity and simulcasting over the last two decades, which now accounts for 80 percent of the statewide handle, has been accompanied by a corresponding decline in handle and attendance at racetracks. To encourage the continuing viability of these tracks, the State authorized higher takeouts to support capital improvements at NYRA tracks and, more importantly, reduced its on-track tax rates by 30 percent to 90 percent at thoroughbred and harness tracks. The State also assumed the costs for regulation and drug testing. In 1995, the State increased the takeout on NYRA multiple wagers (involving two horses), while lowering the takeout on NYRA regular wagers (involving one horse). Recent legislation, extended the authorization for telephone betting, in-home simulcasting experiments, expansion of track and OTB simulcasting through July 1, 2007, and lowered the tax rates on simulcast wagering. It also eliminated the State franchise fee on nonprofit racing associations (viz., NYRA), effective January 1, 1998, and extended the NYRA franchise to 2013, if NYRA installs VLTs (Video Lottery Terminals) in Aqueduct racetrack on or before March 1, 2004. In addition, the tax rate on NYRA bets was cut from 3.0 percent to 2.6 percent in 1999, and to 1.6 percent in 2001. Legislation enacted on May 16, 2003, instituted a regulatory fee to directly fund the State's regulation of racing, authorized tracks to set their own takeout rates within a narrow range, allowed unlimited simulcasts, and eliminated mandatory fund balances for telephone betting accounts.

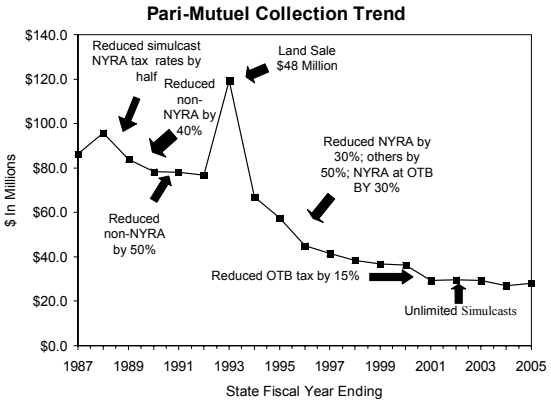
Trends in Attendance: All Tracks





Trends in Wagering





FORECAST METHODOLOGY

Since the tax is a function of the kind of wager (bet), type of race, and the place where wagers are made, the starting point is the analysis of the trends in the data on handle in the various modes of betting. Several econometric studies have been performed on this source. However, changes to the tax base, increased competition from new racing venues, and casino and Native American gaming have made traditional econometric estimation difficult. It now appears that variations in weather conditions and the length of racing seasons are the most relevant factors affecting the tax base.

While earlier periods witnessed significant changes in the distribution of regular, multiple, and exotic wagers as the State authorized increases in the number and types of wagers, evidence from recent periods suggests that the relative distribution has remained stable. In 2002, New York State tracks reported that 34.3 percent of the wagers were regular, 38.5 multiple, and 27.2 percent exotic. However, since statutory changes can affect this distribution, individual trends are monitored to improve forecasting accuracy.

The expansion of OTBs has contributed, in part, to the continuing downward trends in on-track handle and attendance. The increase of simulcasting in recent years has been part of the cause of the off-track wagering now accounting for 80 percent of the statewide handle. Accordingly, time series models, with suitable adjustments for law changes and number of racing dates, are used to separately forecast thoroughbred, harness and OTB handles. At this point, tax rates are applied to the forecast of handles to determine tax revenues. In 2003-04, State taxes are estimated at $27.4 million on a handle of $2.5 billion, producing an effective tax rate of 1.05 percent. Given the low tax rates, a variance of $1 million in handle creates only an $11,000 variance in receipts. Thus, only factors that produce large and unexpected swings in bettor behavior will produce a significant error in the estimate.

Revenue History

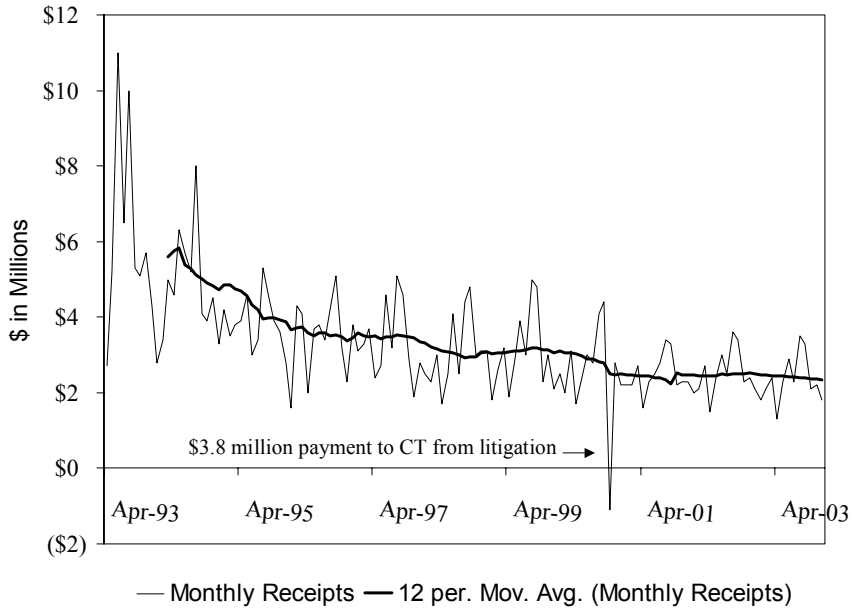
PARI-MUTUEL REVENUES
FISCAL YEAR ENDING MARCH 31
(millions of dollars

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
											(Estimated)	
Actual	67.0	57.3	45.1	41.6	38.4	36.9	36.3	29.3	29.6	29.5	27.4	28.0
Constant Law	67.0	63.8	60.6	56.2	52.5	50.4	50.5	47.0	49.4	48.0	48.5	49.1
Constant Law Percent Growth	(6.1)	(5.2)	(5.0)	(7.3)	(6.6)	(4.0)	0.2	(6.9)	5.0	(3.0)	1.0	1.2

PERCENTAGE DISTRIBUTION OF GENERAL FUND COLLECTIONS

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
2000-01	24.5	38.4	12.9	24.2
2001-02	21.8	32.3	22.8	23.1
2002-03	23.4	32.2	23.2	21.2
2003-04 (est.)	23.7	32.9	22.0	21.4
2004-05 (est.)	22.9	32.5	22.7	21.9

Pari-Mutuel Tax Monthly Receipts



Risks To Forecast

In October 2001, legislation was enacted to authorize the operation of VLTs in several New York State racetracks. The Division of the Lottery began the VLT program at the Saratoga Equine Sports Center on January 28, 2004. The Finger Lakes Race Track, Monticello Raceway Management, Inc., Buffalo Trotting Association, Inc., and Batavia Downs are expected to open during the course of the fiscal year. The legislation provides that the racetracks are paid a percentage commission from the revenue, after the prizes are paid, then a percentage of revenues is diverted to purses and breeders funds. There is a possibility that the introduction of VLTs at the racetracks, combined with increased purses, could increase revenues. In contrast, excessive delays may force some harness racetracks out of business, or a reduction in the number of racing days due to continuing declines in handle at the tracks and increased competition from other forms of gambling such as casinos could decrease receipts. A terrorist attack in New York State may cause a reduction in attendance and wagering, power outages, communication disruptions, resource constraints, and the loss of key employees.

LOTTERY

BACKGROUND

Tax Base and Rate

In 1966, New York State voters approved a referendum authorizing a State lottery, and ticket sales commenced under the auspices of the Division of the Lottery (the Division). The Division, which manages the sale of lottery tickets, currently operates four types of games and is authorized to operate VLTs (Video Lottery Terminals).

1. Instant games, in which most prizes are paid immediately;
2. Lotto games, which are pari-mutuel, pick-your-own-numbers games offering large top prizes with drawings conducted eleven times weekly: seven 5-of-39 draws (Take 5), and two 6-of-59 draws (Lotto 59) and two multi-jurisdictional drawings (Mega Millions). For the Lotto 59 game and Mega Millions game, the value of any prize not won is added to the top prize in the subsequent drawing for Take 5; if there is no first prize winner, the monies will be added to the second prize pool;
3. Daily numbers games, which are fixed-odds games with daily drawing in which players select either a three digit number (Daily Numbers Game) or a four digit (Win 4) game; and Instant Win, and add-on game to Daily Numbers and Win 4;
4. Keno-like games, which are pick-your-own 10 of 80 numbers games with drawings conducted either daily (Pick 10) or every four minutes (Quick Draw). Lottery pays top prizes of $500,000 in Pick 10 and $100,000 in Quick Draw; and
5. Video Lottery games, which are lottery games played on video gaming devices. They are allowed at selected thoroughbred and harness tracks.

Under current law, the Comptroller, pursuant to an appropriation, distributes all net receipts from the lottery directly to school districts for the purposes of providing school aid. This aid also provides special allowances for textbooks for all school children and additional amounts for pupils in approved State-supported schools for the deaf and the blind.

After earmarking for prizes, the Division uses a portion of net sales (not exceeding 15 percent) for its administration, and the remainder is available to support education. The statutory allocation for education for Lotto 59 and Instant Win games is 45 percent of ticket sales; for Take 5, Mega Millions, Daily Numbers, Win 4, and Pick 10 games, 35 percent; for Instant games, 20 percent; and 10 percent for up to three Instant Games per year; for Quick Draw, 25 percent, and for VLTs 61 percent of net machine income. At the end of each fiscal year, any unspent portion of the 15 percent of ticket sales not used for administration (10 percent for the VLT program) is also used for education.

Administration

Sales agents are notified electronically by the Division's operations' vendor by Monday of each week of the amount due the State from sales during the previous week. The agent has until Tuesday to deposit sufficient funds in specified joint bank accounts at which time the operations vendor sweeps the moneys and transfers them to Lottery by Wednesday morning. For VLT's, the Division will sweep the accounts daily and the State will receive the revenues daily.

DATA SOURCES

The data is collected from the Division and the Department of Taxation and Finance on a weekly and monthly basis.

LOTTERY

STATUTORY CHANGES

Legislation enacted in 1987, 1988, 1991, and 1999 increased the prize allocation for Instant games from 45 percent, to 50 percent, to 55 percent, and finally to 65 percent respectively. Legislation enacted in 1995 and renewed in 1999, 2001, and in 2002 authorized the Quick Draw game through March 31, 2003.

Legislation was enacted on October 29, 2001, to allow the Lottery Division to enter into multi-jurisdictional agreements to conduct Multi-state lotto games with a 50 percent prize payout. The State has elected to join with the Big Game states, and afterward the name was changed to Mega Millions. In addition, legislation was enacted on October 29, 2001, to allow the Lottery Division to license the operation of VLTs at selected New York State racetracks.

Legislation was enacted on January 28, 2002, to allow the Lottery Division to offer up to three 75 percent prize payout Instant ticket games during the fiscal year.

Legislation was enacted on January 28, 2002, to extend Quick Draw until May 31, 2004.

Legislation was enacted on May 2, 2003, for the following adjustments to the VLT program:

- From total sales of video lottery terminals, 92 percent is paid out for prizes.
- Of the balance, the Lottery Division retains 10 percent commission, the racetracks receive 29 percent, and 61 percent is dedicated to education.
- Of the commission paid to the tracks, the amount allocated to purses in years one through three is 25.9 percent; in years four and five, 26.7 percent; and in subsequent years, 34.5 percent.
- The Breeders' funds receive 4.3 percent in the first through fifth years and 5.2 percent in the following years. The racetracks are allowed to enter into agreements with the horsemen no longer than five years of the VLT operation. The expiration date was changed to ten years after the start date of the program.

FORECAST METHODOLOGY

Economic conditions seem to have little explanatory power in predicting Lottery receipts. Accordingly, the various games are initially estimated using probability and time series models and are subsequently adjusted for marketing and operational plans, new game introductions, and law changes.

Lotto

The sales of Lotto tickets are volatile because the jackpots can randomly roll up to high amounts. High jackpots produce significant spikes in sales. The Lotto forecast utilizes a simulation model that mimics the actual Lotto process. We designed the model to simulate one year of Lotto drawings. We set the model to run for 1,000 iterations (1,000 years of Lotto results) to produce output distributions for total sales, total revenue and the seeding necessary to maintain the jackpot levels. The distribution averages are used to calculate the revenue estimate.

First, to run the model, we input the jackpot structure and use a regression model based on historical sales to jackpot ratios to obtain an estimate of sales at each jackpot level, correcting for seasonal effects and other factors. After the sales for a specific draw is calculated, we use another model to predict the coverage ratio (the combinations actually bet divided by the total number of combinations) at that sales level. To determine if the jackpot will be hit, we use a random number generator to generate numbers between zero and one.

If the random number is less than or equal to the coverage ratio, the jackpot is hit. If the random number is greater than the coverage ratio, the jackpot rolls to the next level and the model goes through another iteration.

Each iteration calculates a full year of drawings. Performing the simulation 1,000 times essentially creates 1,000 potential years of results. This allows us to create distributions of possible results and evaluate the probability of achieving a given level of sales. The model also contains features that allow the simulation of numerous events that could affect sales such as introducing Mega Millions, changing the size of the matrix, the interest rate, the level of seeding and altering the jackpot structure.

Instant Games

Instant Games sales are forecast using an econometric model. The data for Instant Games is collected weekly and the model produces weekly estimates for the balance of the fiscal year. There are two exogenous variables: Weighted Average Prize Payout Percent and the number of Terminals. In addition, dummy variables are included to capture the impact of the One Week Sales Lag, and the periodic use of 75 Percent Games, and a trend variable.

Dependent Variable

- Current weekly sales of all Instant Games.

Weighted Average Prize Payout Percent

- Each Instant Game has a prize payout set in statute. Most games payout 65 percent of sales with up to three games paying out 75 percent. This variable is the average prize percent payout per week of all the Instant Games, weighted by the sales per game.

Terminals

- This variable is the number of terminals that sold Instant Games each week. The variable appears to have a non-linear impact on sales. The square of terminals picks up the decreasing returns resulting from the addition of new terminals beyond a certain threshold.

75 Percent Games Dummy

- On October 27, 2001, the Division launched a 75 percent Instant Game and experienced significant growth in sales. The Lottery Division also offered three 75 percent Instant Games during fiscal year 2002-03. A dummy variable is used to account for the increase in Instant Game sales caused by the 75 percent Instant Game. The dummy variable is zero prior to and including October 20, 2001, and is one for the time-span of the first 75 percent Instant Game and for the duration of the 75 percent Instant Games instituted in 2002-03.

One-Week Sales Lag

- The one-week lag incorporates a delayed effect in sales from when a new Instant Game is injected into the market.

Trend

- This variable captures trend growth over time.

INSTANT GAME - MULTIPLE REGRESSION EQUATION

$$\text{Instant Game Sales per Week}_t = 8260 + 83.9079*\text{Trend}_t - .000165*\text{Terminals}^2_t + 0.3012*\text{One-Wk SalesLag}_t + 48{,}154*\text{Weighted Average Prize Percent Payout}_t + 2106*\text{75 Percent Instant Games Dummy}_t$$

t-values: (0.54) (4.35) (-3.51) (6.77) (2.42) (4.59)

Total R Square =	.9704
Durbin-Watson =	2.04
Number of Observations =	606
Root Mean Squared Error =	2133

Quick Draw

Quick Draw sales are estimated using a multiple regression equation. There are three independent variables: The number of terminals, a dummy variable representing the hours Quick Draw is operated daily, a Trend, and a dummy variable for an initiative titled Quick Draw Extra.

Dependent Variable
- Weekly Quick Draw sales.

Trend
- This variable captures trend growth over time.

Terminals
- The variable is the number of terminals selling Quick Draw.

Quick Draw Extra
- This is a dummy variable that represents a game enhancement employing on-premise promotions involving bonus payouts. These promotions typically require on-premise retail displays and educational radio support. The dummy variable is zero prior to and including November 10, 2000, and is one for duration of the initiative in fiscal years 2000-01 through 2002-03, and one for the scheduled time-span of operation in fiscal year 2003-04.

QUICK DRAW - MULTIPLE REGRESSION EQUATION

$$\text{Quick Draw Sales per Week}_t = 2{,}907 - 4.0215*\text{Trend}_t + 2.5534*\text{Terminals}_t + 596.2343*\text{Quick Draw Extra}_t$$

t-values: (6.33) (-3.14) (20.34) (2.44)

Total R Square =	.91
Durbin-Watson =	1.9
Number of Observations =	673
Root Mean Squared Error =	637

Win 4

A multiple regression procedure is used to estimate Win 4 game sales. There are three independent variables: trend, a dummy variable representing the number of draws each day, and a dummy variable representing Bonus weeks.

Dependent Variable

- This variable represents current weekly Win 4 sales.

Trend

- This variable captures trend growth over time.

Draws per Day

- A dummy variable reflecting the amount of Win 4 draws per day. On December 2, 2001, the Division launched a noon draw for the Numbers and the Win4 game. This is a second drawing for each game per day. The dummy variable is zero prior to and including November 24, 2001, and one thereafter.

Bonus Week

- This is a dummy variable reflecting scheduled promotional Bonus days for this game. The dummy variable is zero in every week before and after scheduled Bonus weeks, and is one during the Bonus weeks.

WIN 4 - MULTIPLE REGRESSION EQUATION

$$\text{Win 4 Sales per Week}_t = 5{,}536 + 7.02*\text{Trend}_t + 998.53*\text{Draws per Day}_t + 249.725*\text{Bonus Week}_t$$

t-values (27.36) (15.54) (7.96) (4.33)

Total R Square =	.97
Durbin-Watson =	2.08
Number of Observations =	886
Root Mean Squared Error =	296

Daily Numbers Game

The Daily Numbers sales are estimated by employing a multiple regression equation. There are three independent variables: the number of draws per day, a trend and a dummy variable representing Bonus weeks.

Dependent Variable

- This variable represents current weekly Daily Numbers sales.

Trend

- This variable captures trend growth over time.

Draws per Day

- A dummy variable reflecting the number of Daily numbers draws per day is included. On December 2, 2001, the Division launched a noon draw for the Numbers and the Win 4 game. This is a second drawing for each game per day. The dummy variable is zero prior to and including November 24, 2001, and one thereafter.

Bonus Week

- This is a dummy variable reflecting scheduled promotional Bonus days for this game. The dummy variable is zero in every week before and after scheduled Bonus weeks, and is one during the Bonus weeks.

DAILY NUMBERS - MULTIPLE REGRESSION EQUATION

$$\text{Daily Numbers Sales per Week}_t = 17{,}409 - 6.1952*\text{Trend}_t + 390.6964*\text{Draws per Day}_t + 533.4917*\text{Bonus Week}_t$$

t-values	(20.93)	(-3.25)	(0.76)	(5.55)

Total R Square =	.94
Durbin-Watson =	2.11
Number of Observations =	1010
Root Mean Squared Error =	603

Take 5

Take 5 sales are estimated using a multiple regression equation. There are four independent variables: a dummy variable representing the change in prize payout percent from 40 percent to 50 percent, a dummy variable reflecting the amount of draws offered each week, a dummy variable representing competition from the Mega Millions game, and a trend.

Dependent Variable

- This variable represents current weekly Take 5 sales.

Change in Prize Payout Percent Dummy

- The variable represents the change in prize payout percent for the game from 40 percent at the inception of the game to 50 percent payout on January 18, 1992. The dummy variable is zero prior to and including January 17, 1992, and one thereafter.

Draws per Week

- This dummy variable represents the amount of Take 5 draws available each week. The change from one to two draws per week on June 16, 1992, the growth from two to four draws per week on Jan 6, 1997, and the increase from four to seven draws on September 1, 2000, had significant effects on sales. The dummy variable is one prior to and including January 16, 1992, then it is changed to two to reflect an additional draw per week until January 6, 1997, when it is changed to four, then on Sept 1, 2000, it is seven thereafter to represent seven draws per week.

Mega Millions Competition

- This dummy variable represents the negative impact on the sales of the Take 5 game from the introduction of the Mega Millions game. The dummy variable is zero prior to and including the week of May 18, 2002, and one thereafter.

Trend

- This variable captures trend growth over time.

TAKE 5 - MULTIPLE REGRESSION EQUATION

$$\text{Take 5 Sales per Week}_t = 2{,}437 + 2{,}008*\text{ChangePayout}_t + 409.46*\text{Draws per Week}_t + 1.5762*\text{Trend}_t - 729.6289*\text{MegaMillionsCompetition}_t$$

t-values: (6.04) (7.74) (5.8) (1.29) (-2.87)

Total R Square =	.97
Durbin-Watson =	2.02
Number of Observations =	905
Root Mean Squared Error =	274

Mega Millions

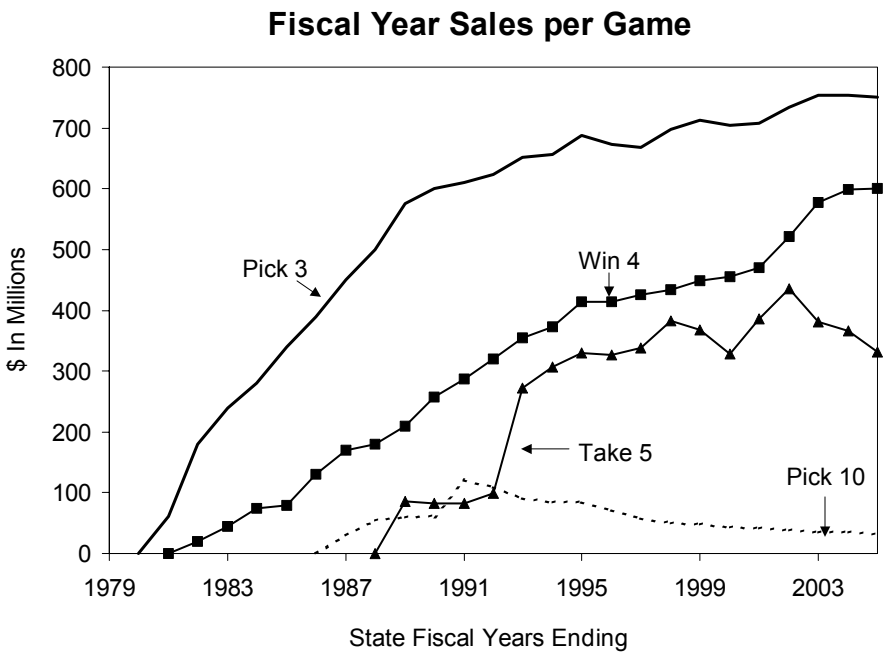
The Mega Millions game forecast is estimated by calculating the average per capita sales and comparing the results to previous historical sales per capita in New York, New Jersey, and Georgia. New Jersey and Georgia had sales history with the Big Game Group before New York State joined the group and the name changed to Mega Millions. The per capita sales are then multiplied by New York State's population to obtain an estimate of weekly sales. Total estimated sales are multiplied by the statutory allocation for education to derive a revenue estimate. Lotto and Take 5 sales are expected to decline due to competition from the Mega Millions. Based upon the historical experience of the original Big Game Group states that have similar games, a reduction in the estimated revenues from the Lotto and Take 5 is expected. As with Lotto, Mega Millions receipts are expected to be volatile due to the random nature in the timing of extremely large jackpots.

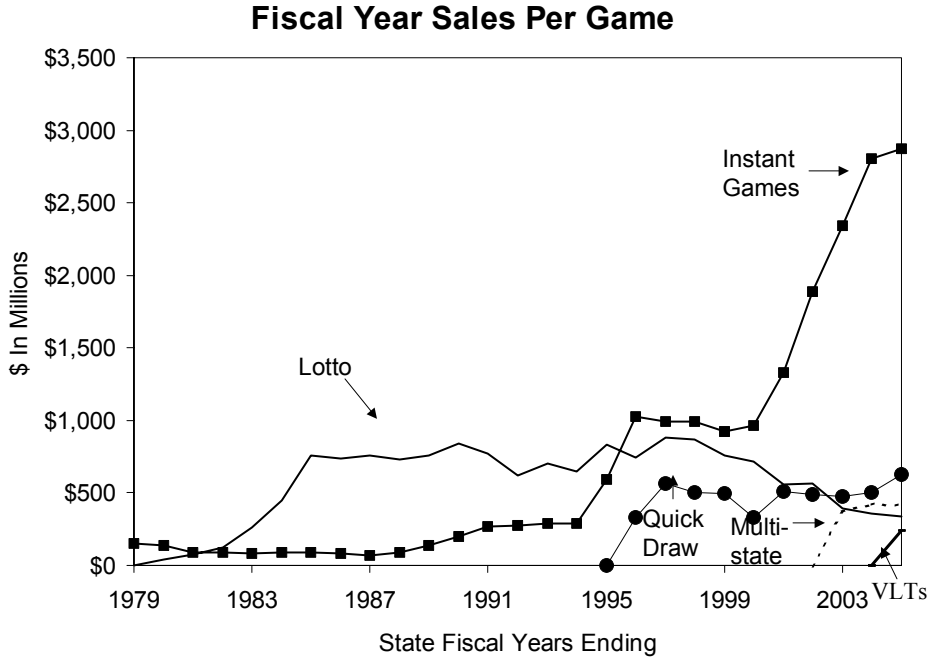
BASE LOTTERY REVENUE FOR EDUCATION
STATE FISCAL YEAR ENDING MARCH 31
(millions of dollars)

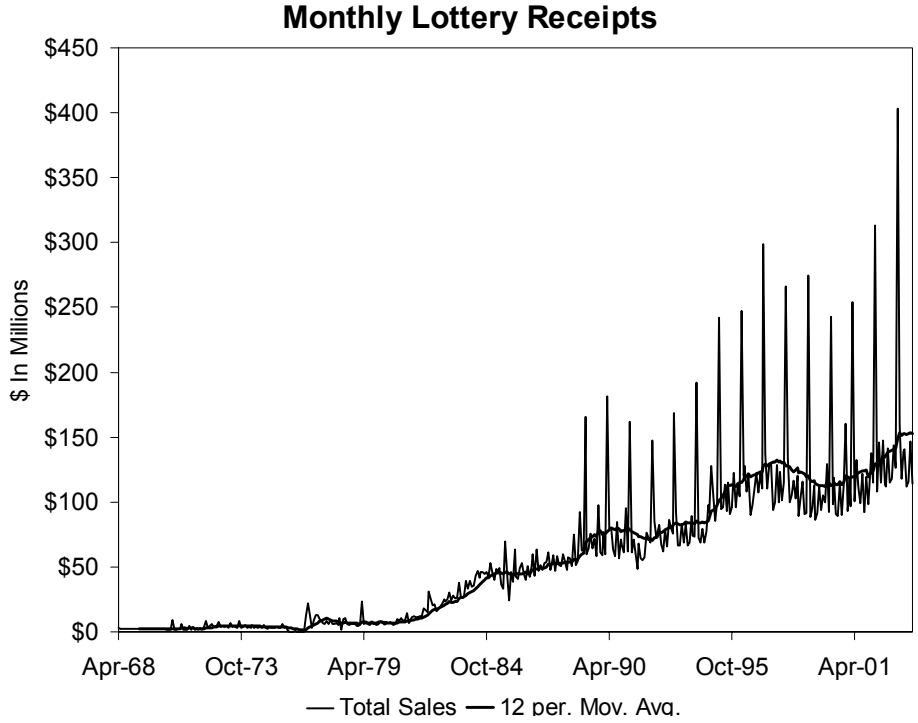
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004 (Estimated)
Actual Receipts	1,054	1,162	1,441	1,533	1,534	1,442	1,349	1,440	1,599	1,826	1,869
Growth Percent	9.7	10.2	24.0	6.4	0.0	(6.0)	(6.4)	6.7	11.0	14.2	2.4

LOTTERY SALES OF PRIMARY GAMES
(millions of dollars)

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004 (Estimated)
Numbers	1,029	1,102	672	668	697	712	705	707	734	753	754
Win 4	373	415	414	426	433	449	456	470	521	577	599
Instant	284	593	1,026	995	994	926	967	1,327	1,886	2,346	2,801
Lotto	647	835	742	882	870	759	755	556	566	391	361
Quick Draw	0	0	328	563	503	493	329	507	488	474	500
Mega Millions	0	0	0	0	0	0	0	0	0	369	420


Fiscal Year Sales per Game
800
700
600
500
400
300
200
100
0
$ In Millions
Pick 3
Win 4
Take 5
Pick 10
1979
1983
1987
1991
1995
1999
2003
State Fiscal Years Ending


Fiscal Year Sales Per Game
$3,500
$3,000
$2,500
$2,000
$1,500
$1,000
$500
$0
$ In Millions
Instant Games
Lotto
Quick Draw
Multi-state
VLTs
1979
1983
1987
1991
1995
1999
2003
State Fiscal Years Ending



PERCENTAGE DISTRIBUTION OF CASH RECEIPTS

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
1995-96	20.1	19.6	19.7	40.6
1996-97	21.4	18.8	19.2	40.6
1997-98	22.5	19.6	18.5	39.4
1998-99	21.9	20.4	18.6	39.1
1999-00	17.9	20.4	21.7	40.0
2000-01	19.0	18.6	21.0	41.4
2001-02	18.8	30.5	18.3	32.4
2002-03	19.4	20.0	19.9	40.7
2003-04 (est.)	25.8	23.7	24.2	26.3

Risks To Forecast

An adverse ruling in a lawsuit contesting the Constitutionality of legislation authorizing the Mega Millions game and VLTs could terminate both the game and the VLT program. Additional delays and unforeseen problems could reduce VLT revenues. The Mega Millions game may achieve lower sales than forecasted if we do not achieve the number of large jackpots that are expected. Mega Millions cannibalization of sales for Lotto and Take-5 may be more severe than expected. A terrorist attack in New York State could cause the loss of key employees, power, communication, travel capability, and crucial resources needed for Division operations.

VIDEO LOTTERY

BACKGROUND

Chapter 383 of the laws of 2001 first authorized video lottery terminals on October 29, 2001. This statute authorized the operation of video lottery terminals at selected racetracks throughout the State and set the initial operating parameters.

Tax Base and Rate

The tax base is the amount wagered at video lottery facilities. The amount dedicated to education is fixed in statute at 61 percent of net machine income (the amount wagered minus the prizes awarded). The tracks retain 29 percent of net machine income and the Division of the Lottery retains 10 percent for administration expenses. In addition, the statute provides that any amount not spent by the Division of the Lottery for administrative expenses is also earmarked for education. Under current law, the Comptroller, pursuant to an appropriation, distributes all net receipts from the lottery for the purposes of providing education aid. Legislation submitted with the 2004-05 Executive Budget provides for up to eight additional licenses to operate video lottery facilities.

Administration

The Division of the Lottery has the responsibility for the regulation and oversight of the video lottery program. The Division of the Lottery's central computer system controls all video lottery terminals and accounts.

DATA SOURCES

The data available on VLT operations will be collected and reported by the Division of the Lottery.

STATUTORY CHANGES

Legislation was enacted on October 29, 2001, to allow the Division of the Lottery to license the operation of VLTs at selected New York State racetracks. Legislation enacted on May 2, 2003, made the following major adjustments to the VLT program:

- Of the revenue remaining after payment of prizes, the Division of the Lottery retains 10 percent commission, the racetracks receive 29 percent, and 61 percent is dedicated to education.
- Of the 29 percent commission paid to the tracks, the amount allocated to purses in years one through three is 25.9 percent; in years four and five, 26.7 percent; and in subsequent years, 34.5 percent.
- Of the 29 percent commission paid to the tracks, the harness and thoroughbred Breeders' funds receive 4.3 percent in the first through fifth years and 5.2 percent in all the following years.
- The racetracks are allowed to enter into agreements with the horse owners for no longer than five years, to allow the tracks to retain a portion of the revenue dedicated to purses for the operation of the facilities.

FORECAST METHODOLOGY

Current estimates are based on an approach flexible enough to respond to a rapidly changing VLT environment. It begins with the most current information available from the Division of the Lottery, the tracks, private sector consultants, and published reports to set the initial revenue generating potential of each facility. This allows an estimate of net machine income and in the remaining analysis we focus on the impacts of competition, location,

number of facilities and alternatives to program expansion. This abbreviated approach to the estimates allows for the immediate estimation of receipts expected from VLTs and is consistent with industry standards and the approach taken in other states.

The Division decided that in such a dynamic environment it would be useful to construct a more complete methodology that would allow for the actual estimation of net machine income for proposed and existing facilities. This effort has required extensive programming, the application of GIS modeling and the incorporation of U.S. Census data to determine the underlying market for VLTs by facility. At the current time, we are continuing to build this more comprehensive model at the facility level. We have been able to use this approach to validate aggregate statistics on the total market for VLTs, the number of potential participants and the amount spend at VLT facilities.

Current Methodology

The Division of the Budget has constructed a simulation model that allows us to estimate revenues from video lottery terminals using as inputs information used by the facility operators and industry experts as well as published reports. The approach conforms to standard practices used in related studies. This model allows an efficient method for developing quick "what if" estimates. The simulation model begins with an estimate of net machine income (the gross amount bet minus the prizes paid out) per machine per day provided by the tracks, industry experts, and published reports.

The video lottery forecast begins by making certain assumptions concerning the structure and viability of the program. These assumptions include but are not limited to:

- The average prize payout averages 92 percent over the period of analysis.
- All facilities will operate for 365 days per year.
- All facilities will operate for 16 hours per day.
- All facilities operate the expected number of machines.
- Marketing, advertising, food and beverage, entertainment, the facilities quality of experience is competitive.
- All facilities complete their currently anticipated expansion plans.
- All facilities qualifying for the VLT program begin operations and continue to operate throughout the period of analysis.
- The statutory distribution of revenue does not change over the period of analysis.
- Other than the facilities specifically accounted for in the model, no new casinos or racinos become operational in the market area during the period of analysis.

Defining the Market Area

To estimate the potential revenue for any facility located in New York, you must be able to assess the performance of a particular facility adjusting for the impact of potential competitors. Since most studies assume that the market for a VLT facility can range as far as 150 miles, the market area for New York State facilities should include any competitor facility within 150 miles of a State-run facility. For this purpose, we have input the latitude and longitude of every facility operating in the nine northeastern states and eastern Canada, which we define as New York's market area (Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, Pennsylvania, Rhode Island, Vermont, and New York).

Inputs

The model divides the total market area for each facility into three zones: primary, 0 to 50 miles; secondary, 50 to 100 miles; and the tertiary, 100 to 150 miles. We input the latitude and longitude of each facility and calculate the arc distance between each facility to determine whether it falls with the primary, secondary or tertiary market areas of all surrounding facilities. Where we did not know the actual location of the facility, we assumed a logical location within

the appropriate municipality or region. We assume that if one facility is within the primary zone of another facility it will reduce the sales of that facility by 10 percent. If it is in the secondary zone, it will reduce the sales of its competitor by 5 percent and if it is in the tertiary zone, it will reduce sales by 1 percent. This produces an approximation of the impact from surrounding facilities that is sensitive to the distance between the facilities and the size of each facility. Most facilities fall into the market areas of several facilities. As a result, the net machine income is reduced from the amount that would be expected if the facility had no competition by a "competitive factor." This approach allows us to locate a facility anywhere in New York's market area and quickly determine its impact on all surrounding facilities and the potential for that facility given rival locations.

A second input in determining revenue results is the attractiveness of a location. This factor accounts for the fact that not all facilities are equal. Some facilities could be large with thousands of machines while others will be relatively small. Some locations will have attached or related hotels and other amenities, while most will be stand-alone facilities. Some facilities will be heavily marketed with extensive advertising budgets and provide complimentary services, while others will not.

The next input is the number of machines per facility per month and the estimated start date for each facility. For the racetracks, we used the most recent information available from the Division of the Lottery and supplemented this information to account for potential risks. This matrix of number of machines allows us to move start dates, allow for facility expansions and allows us to account for new facilities.

The final input is an estimate of the amount spent per hour per machine. This amount is set initially to reproduce the net machine income assuming there is no competition. This amount is grown each month to account for increases in inflation. The amount spent per hour is then multiplied by the competitive factor (mentioned above) which is derived by factoring in the competitive forces acting on each facility located in its market area.

We also make minor adjustments to account for the possibility that a facility will not be open each day of the year, that some portion of machines may not be operative and that the facility may not be open for the maximum amount of time permitted. The model also allows for other risks to the forecast, such as a change in the prize payout, expansion plans, and changes in the hours of operation or days of operation.

At this point, we can estimate the total amount wagered at each facility for each month through 2009-10. We assume that 92 percent of this amount is paid-out in prizes and the remaining amount is divided as specified in law. To account for competition with existing lottery games, it is assumed that in the first year 5 percent of net machine income will come from the revenue from other lottery games and in the second year this falls to 3 percent. We anticipate no further falloff in the third and subsequent years.

Risks to the Forecast

Clearly, the estimation process is highly dependent on a myriad of assumptions. We believe the assumptions made are reasonable and based on industry norms but there is the possibility of significant deviations from these averages. Casinos compete by increasing the amount paid out in prizes. We are assuming 92 percent payouts but if competition drives this number up, it could have a significant impact on revenues. For example, if competition drives the prize payout up to 94 percent, the amount of revenue to New York would, holding other factors constant, fall by 25 percent. In addition, the estimate assumes no additional facilities will be built in New York State's market area. However, there are discussions about allowing slot machines at the Meadowlands; Pennsylvania and other neighboring states are considering authorizing racinos; and there are continual expansions at Foxwoods, Mohegan Sun and Turning Stone.

On the other hand, the market for video lottery gaming could be greater than anticipated, especially in the New York City metropolitan area. If this proves to be correct, the estimates of net machine income could be understated and the estimates of losses due to competition might be too high.

Comprehensive Methodology

The Division of the Budget has constructed a more complex micro-simulation model that allows the State to estimate revenues from video lottery facilities over a multi-year period. We designed the model to be flexible enough to incorporate, among other things, changes in start dates, the number of machines per facility, the location and attractiveness of facilities, the market area of each facility. The model uses the same initial assumptions as under the current model. (See above.)

Defining the Market

In most respects, the Division of the Budget's methodology follows standard industry practice. The first phase is to determine the market for video lottery gaming. Since the market area for a casino or a video lottery facility can extend out for more that 100 miles, it was necessary to define a possible market area for New York facilities that comprises nine states (Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, Pennsylvania, Rhode Island, Vermont, and New York).

To fully understand the market potential for video lottery terminals and slot machines in New York, three questions must be addressed:

1. How many potential participants live in the New York market area.
2. How often will the participants visit a casino or VLT facility.
3. How much will they spend each time they visit a facility.

Number of Participants

To estimate the potential number of participants, a demographic profile of people who typically patronize casinos is input. To account for differences among the states in participation rates, we adjust the national rates for each demographic variable to reflect the state-specific participation rate. We utilize the census tract as the proper level for regional analysis. Using the adjusted data, we estimated the number of participants by applying state-specific participation rates for each of the four demographic characteristics. This provides an indication by census tract of how many people are likely to participate in the nine-state market area.

Data is expected for people over 20 years of age. In New York, persons 18 and older can visit VLT facilities. To estimate the number of participants in the 18 to 20 age bracket, we used the Census estimates of population and applied the participation rate from the next higher age bracket.

Applying this calculation to New York shows New York's population 21 plus years of age at 13,505,172 and an estimated participation rate of 25.8 percent. However, participation rates vary by state from a high of 47 percent in Nevada to 6.4 percent in West Virginia. The participation rate appears correlated with the availability of casinos and this suggests that additional participants are encouraged by access to VLT venues. Therefore, we assume that as more VLTs become available the participation rates in New York and some surrounding states will increase to between 35 percent and 40 percent which seems to be the norm for states with easier access to these facilities.

PARTICIPATION RATES*

State	Participation Rates (percent)
Connecticut	38.2
Maine	9.7
Massachusetts	27.5
New Hampshire	17.4
New Jersey	39.5
New York	25.8
Pennsylvania	21.3
Rhode Island	32.2
Vermont	14.7

* Source: *"Profile of the American Casino Gambler."*

This increase in participation parallels the expected increase in the number of machines from about 7,000 today to roughly 65,000 (depending upon the final disposition of the legislation submitted with the 2004-05 Budget). At that point, the industry will be fully mature and our participation rates should equal that of other states, such as Connecticut and New Jersey, whose residents have had full access to casinos for several years.

To arrive at a multi-year monthly forecast, we project the demographic trends and participation rates by month to March 2011. We then apply the appropriate monthly participation rate to each of the four demographic categories in each census tract to arrive at four monthly estimates of the number of potential participants in each census tract. We use an un-weighted average of the four estimates to arrive at a final estimate. We increase the estimated participation rates of some fully mature states, such as New Jersey and Connecticut modestly over the projection period.

Number of Visits

To estimate the frequency of visits we combine two approaches. First, several published studies indicate that the closer an individual lives to a casino the more frequently they will visit. One study by KPMG postulated that a typical person within the primary market area of a casino (less than 50 miles) would visit on average ten times per year. A person within the secondary market area (50 miles to 100 miles) would visit six times per year on average and in the tertiary area (100 miles to 150 miles) would visit three times per year. The Harrah's Profile found that nationally the average casino player visits a casino 5.7 times per year. Again, the Profile gives the average number of visits by state and it appears that the number of visits increases in states with higher participation rates. We have calibrated our analysis using both studies and the results from the model are relatively close.

Amount Gambled

To determine the amount spent per visit we relied on two studies. Oregon completed a study that indicated that the average person would gamble approximately 1.16 percent of their annual income on all forms of gaming. KPMG, on the other hand, postulated that people in the primary market area would be willing to lose $45 each time they visited a casino, $50 in the secondary market area and $65 in the tertiary market area. We have used both assumptions in our analysis obtained similar results from the model.

Defining the Market Area for Each Facility

The VLT analysis next concentrates on allocating the aggregate number of visits and gaming dollars in New York's market area to each of the potential venues. There are several existing facilities in New York, the surrounding states and in Canada and over the next five

years, New York could add a significant number of new facilities. Each will compete for potential VLT players and gaming dollars. In this section, we describe how we determine the distribution of potential VLT customers and revenue among all the competing facilities.

Concentric Rings

To establish a market for a facility we began with the accepted norms for the industry. The primary, secondary and tertiary markets were set at 0 to 50 miles, 50 to 100 miles and 100 to 150 miles, respectively. This produces three concentric rings around each facility. We calculated the arc distance from the latitude and longitude of the geographic centroid of each census tract to the latitude and longitude of each facility, or the centroid of the census tract containing the facility. Where we did not know the actual location of the facility, we assumed a logical location within the appropriate municipality or region. We then determined whether a given census tract fell within the primary, secondary or tertiary market area of another facility. We used the attractiveness factor to adjust the facility's market area to reflect its relative drawing power.

Most census tracts fell into the market areas of several facilities. To allocate the visits (and the potential revenue from each census tract) to each facility, we calculated the probability that the participants in a census tract would visit each casino. To determine the probability that an individual would visit a casino, we used a gravity model approach, which assumes that the propensity to visit a facility is inversely related to the square of the distance from the facility and directly related to the attractiveness of the facility. This is a standard approach in location theory and is used widely by those in the gaming industry. Based on prior analysis by industry experts, we used a power of 2.5 as opposed to the square as it has proven to them to be a good predictor of actual results. Using these probabilities, we calculated for each census tract the number of visits to each facility.

SAMPLE PROBABILITIES OF VISITING A CASINO
(percent)

	Primary	Primary Secondary	Primary Tertiary	Primary Secondary Tertiary	Secondary	Secondary Tertiary	Tertiary
Primary	100.0	88.2	96.1	85.2			
Secondary		11.8		11.4	100.0	76.8	
Tertiary			3.9	3.5		23.3	100.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Travel Time

Another, possibly more accurate, way to establish a market area considers travel times. Here the model assumes that people are more responsive to the time it takes them to travel to a facility than the straight line distance between their home and the facility. Again, following the norms in other studies, we established the primary, secondary and tertiary market areas as 0 to 30 minutes, 30 to 90 minutes and 90 to 150 minutes. Assuming an average speed of 50 miles per hour and allowing 15 minutes to get to a major highway, makes these market areas comparable in size to the concentric ring model. In this case, the market areas will become irregular, generally following major highway systems, which could include census tracts with significantly different demographics than the census tracts identified using the concentric rings method. We also adjust the travel times to reflect the attractiveness of the facility as already discussed. The process for allocating gamblers and gambling dollars is identical to the concentric rings analysis.

Facility Limits

To this point, the model will produce estimates of the number of participants, the number of visits and total gaming revenue spent at each facility. However, there are other factors that limit usage. The industry standard assumption is that a participant will spend three hours at a VLT. In New York, the hours of operation are limited to 16 hours per day. This implies that each machine can accommodate 5.33 players per day. For example, if a facility had 2,000 machines, the maximum number of average duration visits the facility could accommodate is 10,667 per day. If the model results indicate that a facility market area would only support 5,333 visits per day, half of the machines would stand idle on average. Likewise, if the facilities market area will produce 21,333 visits per day, the waiting time to use machines would be significant.

Overall, industry experts estimate facility utilization at 80 percent. Looking at the facility limitations above, we combined these two parameters and created a sliding scale that compares the number of visits that the facility's market area will produce and adjust the facility's utilization factor to account for expected market demand. This allows us to uncover possible areas of market saturation and areas with the greatest potential for expansion.

Other Factors

Since the object of the model is to produce estimates of State fiscal year revenues, we need to be sensitive to the actual period of operation during each fiscal year and to the competitive effects of other facilities. For the tracks, we have used the most recent information available from Lottery to specify expected start dates and the initial number of machines. We have also incorporated in the model the ability to add new facilities anywhere in the Northeast and to adjust to any expansion plans anticipated by the tracks or other facilities.

To attempt to reflect the impact of the recently authorized Native American casinos, we have assumed start dates and the number of terminals at each facility. At this time, however, the start dates, the number of machines and other parameters for the new Native American casinos are highly speculative. Unlike the facilities regulated by Lottery, which will give at least 61 percent of their gross proceeds to education, the revenue available to the State from Native American casinos will be significantly less.

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