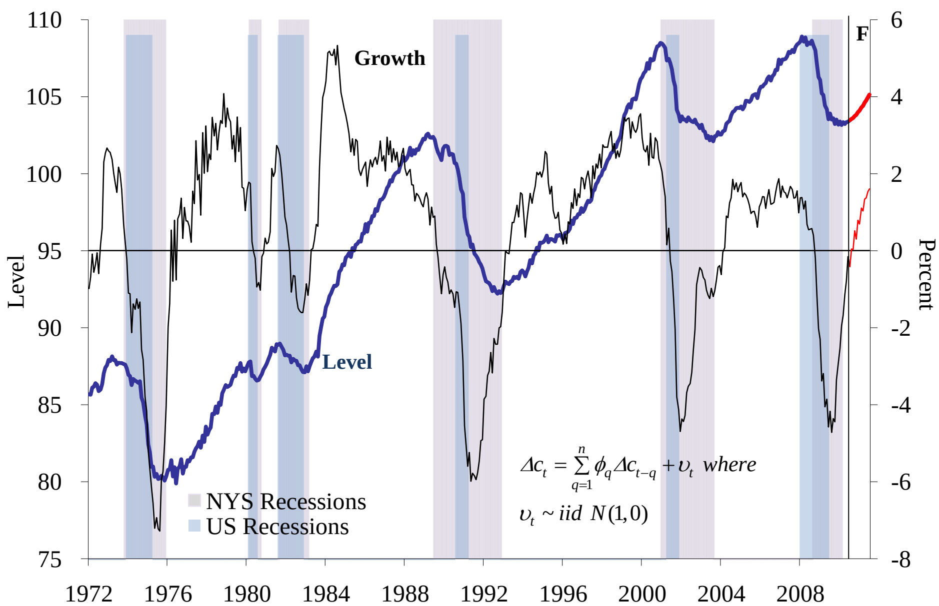
New York State

New York State Index of Coincident Economic Indicators



Economic, Revenue, and Spending Methodologies

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AN OVERVIEW OF THE METHODOLOGY PROCESS

The Division of the Budget (DOB) Economic, Revenue and Spending Methodologies supplements the detailed forecast of the economy, tax, and spending forecasts presented in the Executive Budget and Quarterly Updates. The purpose of this volume is to provide background information on the methods and models used to generate the estimates for the major receipt and spending sources contained in the 2010-11 Mid-Year Update and the upcoming 2011-12 Executive 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, revenue and spending data to form multi-year quarterly projections of economic, revenue, and spending changes.

The spending side analysis is designed to provide, in summary form, background information on the methods and analyses used to generate the spending estimates for a number of major program areas contained in the budget, and is meant to enhance the presentation and transparency of the State's spending forecast. The methodologies illustrate how spending forecasts are the product of many factors and sources of information, including past performance and trends, administrative constraints, expert judgment of agency staff, and information in the State's economic analysis and forecast, especially in cases where spending trends are sensitive to changes in economic conditions.

AN ASSESSMENT OF FORECAST RISK

No matter how sophisticated the methods used, all forecasts are subject to error. For this reason, a proper assessment of the most significant forecast risks can be as critical to the budget process as the forecast itself. Therefore, we begin by reviewing the most important sources of forecast error and discuss how they affect the spending and receipt forecasts used to construct the Mid-Year Update.

Data Quality

Even the most accurate forecasting model is constrained by the accuracy of the available data. The data used by the Budget Division to produce a forecast typically undergo several stages of revision. For example, the quarterly components of real U.S. gross domestic product (GDP), the most widely cited measure of national economic activity, are revised no less than five times over a four-year period, not including the rebasing process. Each revision incorporates data that were not available when the prior estimate was made. Initial estimates are often based on sample information, though early vintages are sometimes based on the informed judgment of the analyst charged with tabulating the data. The monthly employment estimates produced under the Current Employment Statistics (CES) program undergo a similar revision process as better, more broad-based data become available and with the evolution of seasonal factors. For example, the total U.S. nonagricultural employment estimate for December 1989 has been revised no less than ten times since it was first published in January 1990.[1] Less

[1] The current estimate for total employment for December 1989 of 108.8 million is 0.7 percent below the initial estimate of 109.5 million.

frequently, data are revised based on new definitions of the underlying concepts.[2] Unfortunately, revisions tend to be largest at or near business cycle turning points, when accuracy is most critical to fiscal planners. Finally, as demonstrated below, the available data are sometimes not suitable for economic or revenue forecasting purposes, such as the U.S. Bureau of Economic Analysis estimate of wages at the state level.

Model Specification Error

Economic forecasting models are by necessity simplifications of complex social processes involving millions of decisions made by independent agents. Although economic and fiscal policy theory provides some guidance as to how these models should be specified, theory is often imprecise with respect to capturing behavioral dynamics and structural shifts. Moreover, modeled relationships may vary over time. Often one must choose between models that use the average behavior of the series over its entire history to forecast the future and models which give more weight to the more recent behavior of the series. Although more complicated models may do a better job of capturing history, they may be no better at forecasting the future, leading to the parsimony principle as a guiding precept in the model building process.

Reporting Model Coefficients: Fixed Points or Ranges?

Although model coefficients are generally treated as fixed in the forecasting process, coefficient estimates are themselves random variables, governed by probability distributions. Typically, the error distribution is assumed to be normal, a key to making statistical inference. Reporting the standard errors of the coefficient distributions gives some indication of how precisely one can measure the relationship between two variables. For many of the results reported below, point estimates of the coefficients are reported along with their standard errors. However, it would be more accurate to say that there is a 66 percent probability that the true coefficient lies within a range of the estimated coefficient plus and minus the standard error.

Economic Shocks

No model can adequately capture the multitude of random events occur that can affect the economy, and hence revenue and spending results. September 11 is an example of such an event. Also, some economic variables are more sensitive to shocks than others. For example, equity markets rise and fall on the day's news, sometimes by large magnitudes. In contrast, GDP growth tends to fluctuate within a relatively narrow range. For all of these reasons, the probability of any forecast being precisely accurate is virtually zero. But although one cannot be confident about hitting any particular number correctly, one can feel more confident about specifying a range within which the actual number is likely to fall. Often economic forecasters use sophisticated techniques, such as Monte Carlo analysis, to estimate confidence bands based on model performance, the precision of the coefficient estimates, and the inherent volatility of the series. A 95 percent confidence band (or even a much less exacting band) often can be quite wide,

[2] The switch from SIC to NAICS is a classic example of how changes in the definition of a data series can challenge the modeler. The switch not only changed the industrial classification scheme, but also robbed state modelers of decades of employment history.

suggesting the possibility that the actual result could deviate substantially from the point estimate. Even with a 95 percent band, there is a 5 percent chance of a shock that results in an extremely unexpected outcome. Indeed, based on some of the events of the last 10 years — the high-tech/Internet bubble, September 11, and the recent financial crisis — it could be argued that this probability is much higher than 5 percent. Finally, from a practitioner's perspective, these techniques are only valid if the model is properly specified.

What sometimes appears to be a random economic shock may actually be a more permanent structural change. Shifts in the underlying economic, revenue, or spending structure are difficult to model in practice, particularly since the true causes of such shifts only become clear with hindsight. This can lead to large forecast errors when these shifts occur rapidly or when the cumulative impact is felt over the forecast horizon. Policy makers must be kept aware that even a well specified model can perform badly when structural changes occur.

Evaluating a Loss Function

The prevalence of sources of forecast error underscores the importance of assessing the risks to the forecast, and explains why the discussion of such risks consumes such a large portion of the economic backdrop presented with the Executive Budget. In light of all of the potential sources of forecast risk, how does a budgeting entity utilize the knowledge of risks to inform the forecast? Standard econometric theory tells us that the probability of any point forecast being correct is virtually zero, but a budget must be based on a single projection.

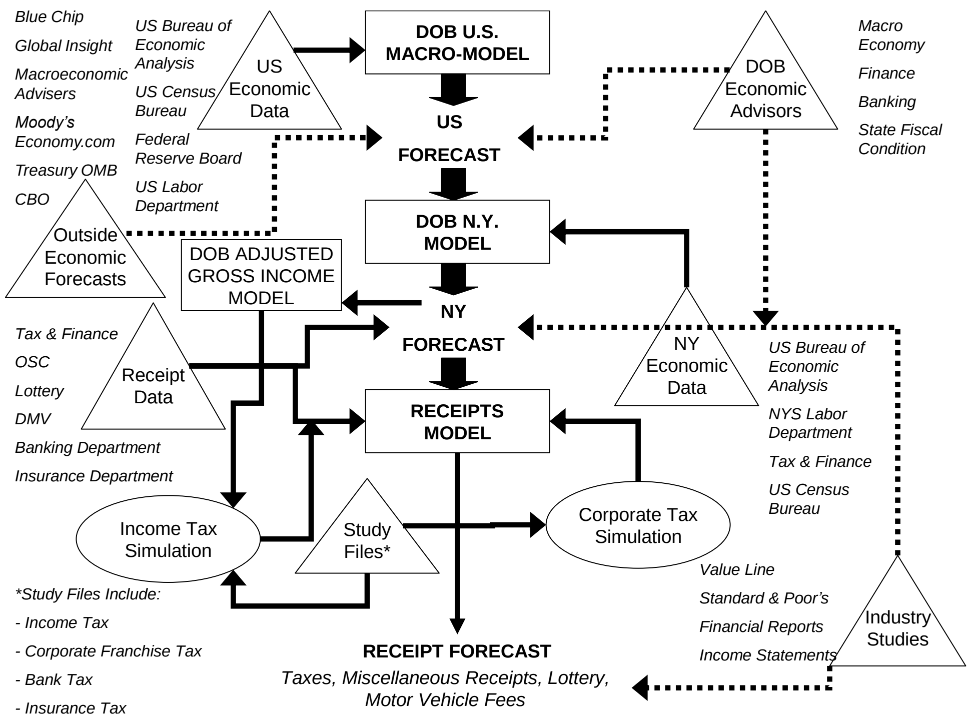
One way to reconcile these two facts is to evaluate the cost of one's forecasting errors, giving rise to the notion of a loss function. A conventional example of a loss function is the root-mean-squared forecast error (RMSFE). In constructing that measure, the "cost" of an inaccurate forecast is the square of the forecast error itself, implying that large forecast errors are weighted more heavily than small errors. Because positive and negative errors of equal magnitude are weighted the same, the RMSFE is symmetric. However, in the world of professional forecasting, as in our daily lives, the costs associated with an inaccurate forecast may not truly be symmetric. For example, how much time we give ourselves to get to the airport may not be based on the average travel time between home and the gate, since the cost of being late and missing the plane may outweigh the cost of arriving early and waiting awhile longer. Granger and Pesaran (2000) show that the forecast evaluation criterion derived from a decision-based approach can differ markedly from the usual RMSFE. They suggest a more general approach, known as generalized cost-of-error functions, to deal with asymmetries in the cost of over- and under-predicting.[3] 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. In summary, errors are an inevitable part of the forecasting process and, as a result, policymakers must be fully informed of the forecast risks, both as to direction and magnitude.

[3] For a detailed discussion, see C.W.J. Granger, *Empirical Modeling in Economics: Specification and Evaluation*, Cambridge University Press, 1999.

AN OVERVIEW OF THE METHODOLOGY PROCESS

The flow chart below provides an overview of the receipts forecasting process (an equivalent spending chart is included below). 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 consider all of the sources of model errors and to assess the impact of changes in the revenue environment that models cannot be expected to capture. Adjustments that balance all of these risks while minimizing the appropriate loss function are key elements of the process. Nevertheless, in the final analysis, such adjustments tend to be relatively small. The Budget Division's forecasting process remains guided primarily by the results from the models described in detail below.

The Economic and Revenue Forecasting Process



THE ECONOMY

The economic environment is the most important factor influencing the receipts estimates and has an important impact on spending decisions. New York State's revenue base is dominated by tax sources, such as the personal income and sales taxes, that are sensitive to economic conditions. In addition, expenditures such as Medicaid, welfare, debt service, and nonpersonal service costs are directly related to the state of the economy. As a result, the first and most important step in the construction of receipts and spending 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 are released on the first Friday of each month for the preceding month, while unemployment benefits claims data are released on a weekly basis. Receipts data published by the Office of the State Comptroller are released by the 15th of each month for the preceding month, while similar data from the New York State Department of Taxation and Finance are 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	Governor submits Executive Budget to the Legislature by the middle of the month, or by February 1 following a gubernatorial election.
FEBRUARY	Prepare forecast for Executive Budget With 21-Day Amendments.
MARCH	Joint Legislative-Executive Economic and Revenue Consensus Forecasting Conference.
APRIL	Statutory deadline (April 1) 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.
DECEMBER /JANUARY	Prepare Executive Budget forecast and supporting documentation. Meet with DOB Economic Advisory Board for review and comment on mid-year forecast and incorporate comments of Advisory Board members.

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 model 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 are described in detail in this volume. Model output is combined with a qualitative assessment of economic conditions to complete a preliminary U.S. forecast. In addition, the Budget Division staff review the projections of other forecasters, which 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 trends in employment, income, financial markets, foreign trade, and consumer confidence can have a major impact on New York's economic performance. However, the New York economy is subject to idiosyncratic fluctuations, which can 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 services 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 that 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 of the income components that make up State taxable income are also required. 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 are 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 these data are vital in assessing the plausibility of the existing economic forecast, particularly for the year in progress and at or near turning points when “realtime” data are most valuable.

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 of revenue and spending. In addition, the panel provides insight on other key functions that may impact receipts growth, including financial services compensation and the performance of sectors of the economy difficult to capture in any model.

FORECASTING RECEIPTS

Once the economic forecast is complete, these projections are used to forecast selected revenues. Again, DOB combines qualitative assessments, the econometric analysis, and expert opinions on the New York revenue structure to produce a final receipts forecast.

Decomposing Cash Collections

Much can be learned about the forces operating on receipts just by carefully examining the data. Many of the revenue sections of this report contain a series of related plots termed “component collection graphs.” The first graph in the series is the raw collections data for the tax. The next three plot the underlying components of the series as determined by the structural time series approach developed by Andrew Harvey. This approach decomposes the series into its trend, seasonal, and irregular components. In many cases, close examination of these charts reveals important patterns and shifts in the data that suggest strategies for modeling and forecasting. Although these graphs are not a substitute for more substantive analysis, they represent a productive first step in evaluating the data-generating process.

Modeling and Forecasting

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 estimating process, DOB staff analyze industry trends, tax collection experience, and other information necessary to better understand and predict receipts activity.

For large tax sources, receipt estimates are approached by constructing underlying taxpayer liability and then projecting liability into future periods based on results from econometric models specifically developed for each tax. Microsimulation models are employed to estimate future tax liabilities for the personal income and corporate business taxes. This technique starts with detailed taxpayer information taken directly from tax returns (the data are stripped of identifying taxpayer information) and allows for the actual computation of tax liability under alternative policy and economic scenarios. Microsimulation allows for a bottom-up estimate of tax liability for future years as the data file of taxpayers is "grown," based on DOB estimates of economic growth. As with most DOB revenue models, the simulation models require projections of the economic variables that drive tax liability.

An advantage of the microsimulation approach is that it allows direct calculation of the revenue impact of already enacted and proposed tax law changes on future liability. But while DOB's tax simulation models evaluate the direct effect of a policy change on taxpayers, the models do not permit feedback from the taxpayer back to the macroeconomy.[4] For large policy changes intended to influence taxpayer behavior and trigger changes in the underlying economy, adjustments are made outside the modeling process. Simulating future tax liability is most important for the personal income tax, which accounts for over half of General Fund tax receipts and is discussed in greater detail later in this report. After liability is estimated for future taxable periods, it is converted to cash estimates on a fiscal year basis.

FORECASTING SPENDING

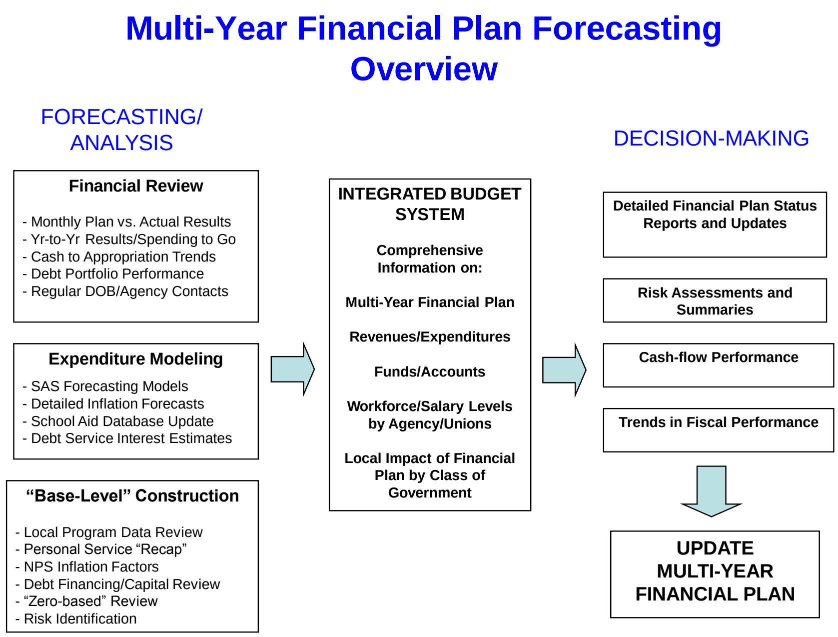
Like revenues, spending projections are often closely tied to the DOB economic forecast. In many cases, spending projections are also tied to institutional and demographic factors pertaining to a specific spending program.

Each spending methodology description below addresses at least four key components, including an overview of important program concepts, a description of relationships among variables and how they relate to the spending forecast, how the forecasts translate into the current Financial Plan estimates, and the risks and variations

[4] For examples of modeling efforts that attempt to incorporate such feedback, see Congressional Budget Office, *How CBO Analyzed the Macroeconomic Effects of the President's Budget*, July 2003.

inherent in each forecast. These factors are described in more detail below for key program areas that drive roughly 80 percent of the State's overall spending forecast.

The following chart depicts, in broad terms, the multi-year forecasting process that DOB employs in constructing its spending forecasts.



AN ASSESSMENT OF FORECAST ACCURACY

The forecast of tax receipts is a critical part of preparing the Financial Plan. The availability of receipts sets an important constraint on the ability of the State to finance spending priorities. The economic forecast provides the foundation upon which the revenue forecasts are based. As discussed above, all forecasts are subject to error. In an area as complex as economic and revenue forecasting, this error can be substantial. The size of the forecast errors can be mitigated by the proper application of forecast tools, but it cannot be eliminated. Below we provide an assessment of the accuracy with which the Budget Division has forecast some key economic variables in recent years, as well as the major revenue groups.

Forecast Accuracy for Selected U.S. Economy Variables

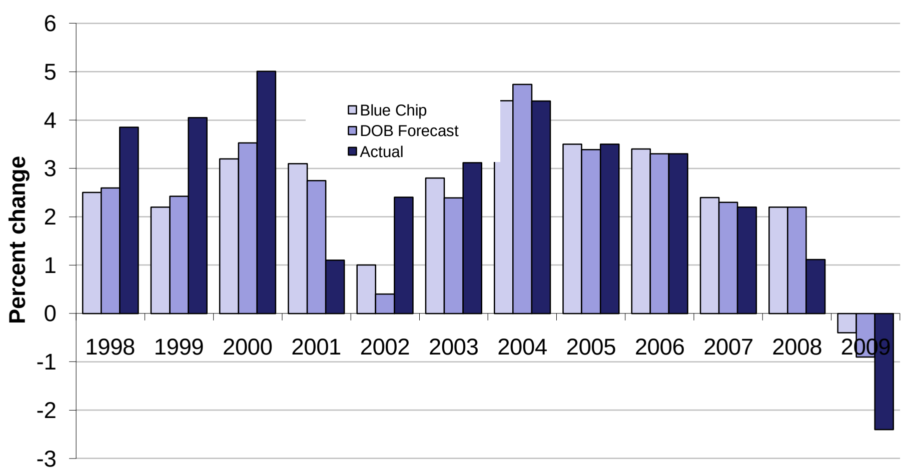
Forecasting the future of the economy is very difficult, due not only to the issues discussed above, but also to the occurrence of economic shocks, i.e., unpredictable events such as the September 11 attacks or the 2005 hurricanes that destroyed much of the Gulf Coast. Predicting business cycle turning points is a particularly difficult challenge for forecasters since the model coefficients on which future predictions are based are fixed at values that summarize the entire history of the data. For example, at the end of 2000, DOB predicted that the economy would experience a significant slowdown for the following year. However, we could not predict the events of September 11. On the other hand, we projected that the impact of September 11 would be less severe but longer lasting than it turned out to be. Here we select a few key economic variables and compare our one-year-ahead annual forecast to the initial BEA and BLS estimates.[5] For comparison purposes, we also include the Blue Chip forecast where available.

As Figure 1 through Figure 4 indicate, when the economy is on a steady growth path, the forecast errors tend to be smaller than when the economy actually changes direction. For both real U.S. GDP and inflation, DOB's forecast has tended to be very similar to the Blue Chip Consensus forecast. Like the Blue Chip consensus forecast, DOB overestimated the strength of real U.S. GDP during the 2001 recession, but underestimated strength of the economy coming out. In contrast, because of the unusually long period by which the U.S. labor market recovery lagged the recovery in output, there was a tendency to overpredict employment in 2002 and 2003 and income in 2003.

Figure 1

Executive Budget Forecast Accuracy: US Real GDP Growth

One year ahead



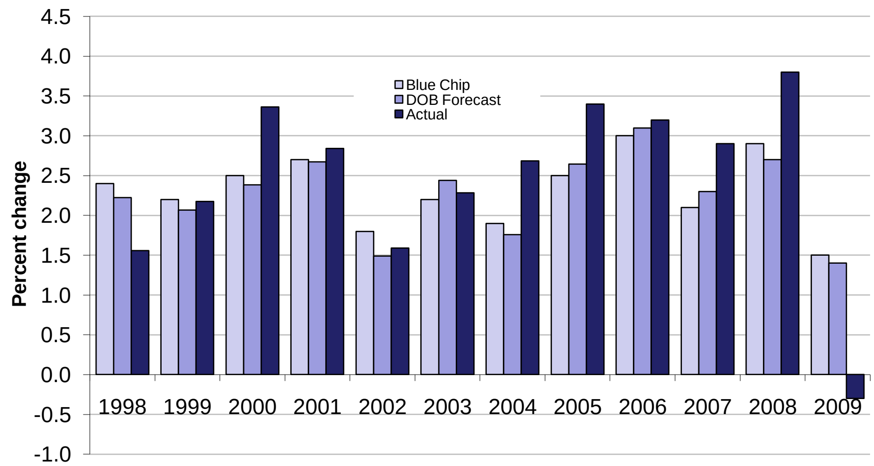
Note: "Actual" is as of BEA's "advance" estimate for the fourth quarter, released at the end of the following January; Blue Chip and DOB forecasts for 2009 date from November 2008 because of the unusually early release date for the 2009-10 Executive Budget.
Source: Moody's Economy.com; Blue Chip Economic Indicators (December forecast for following year); Federal Reserve Bank of Philadelphia; DOB staff estimates.

[5] We use the initial estimates rather than the most recent estimates as benchmarks to assess DOB's forecast accuracy since it would be impossible to forecast future revisions to the data.

Figure 2

Executive Budget Forecast Accuracy: US Inflation

One year ahead

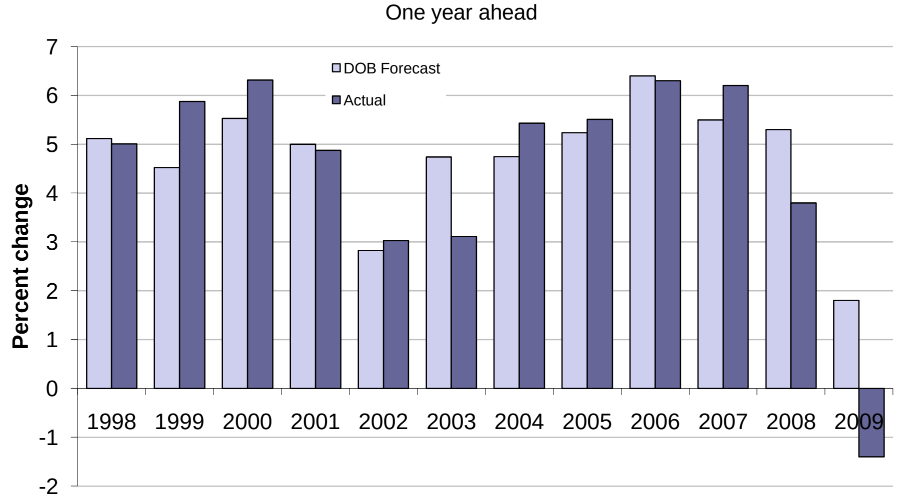


Note: "Actual" is as of BLS's preliminary estimate for December, released in the middle of the following January; Blue Chip and DOB forecasts for 2009 date from November 2008 because of the unusually early release date for the 2009-10 Executive Budget.
Source: Moody's Economy.com; Blue Chip Economic Indicators (December forecast for following year); Federal Reserve Bank of Philadelphia; DOB staff estimates.

Figure 3

Executive Budget Forecast Accuracy: US Personal Income

One year ahead

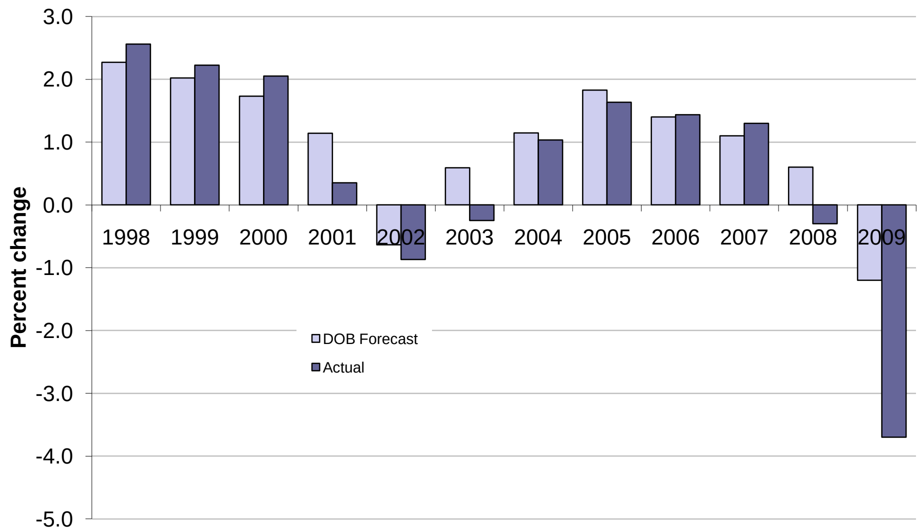


Note: "Actual" is as of BEA's advance estimate of the fourth quarter, released at the end of the following January.
Source: Moody's Economy.com; Federal Reserve Bank of Philadelphia; DOB staff estimates.

Figure 4

Executive Budget Forecast Accuracy: US Employment

One year ahead



Note: "Actual" is as of BLS's preliminary estimate for December, released at the beginning of the following January.
Source: Moody's Economy.com; Federal Reserve Bank of Philadelphia; DOB staff estimates.

Forecast Accuracy for New York State Employment and Wages

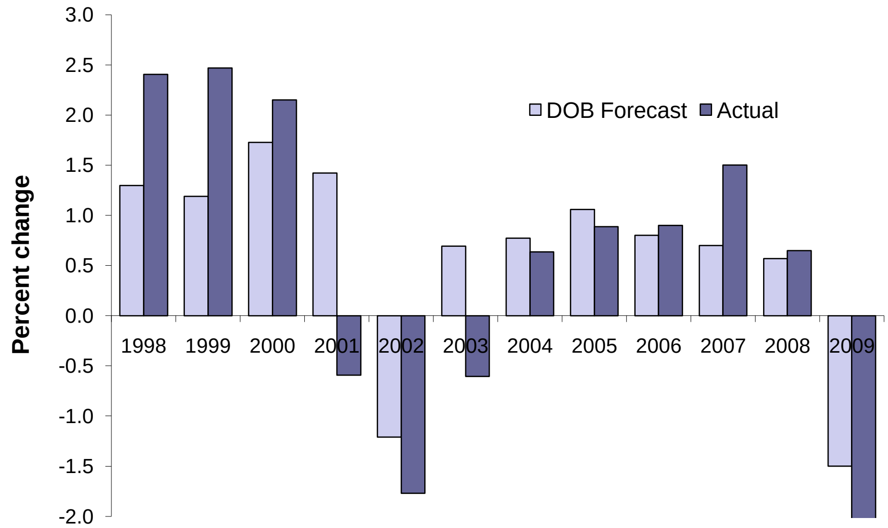
In addition to the problems pertaining to forecasting accuracy discussed in the U.S. section, the constraints that exist for the State economic models are even more severe due to the limited amount of available data. Therefore, we are unable to construct a structural model of similar scale describing the relationships between income, consumption, and production. The main data source available for the New York model is Quarterly Census of Employment and Wages (QCEW) data obtained from the New York State Department of Labor. The following two figures compare DOB's one-year-ahead forecasts to actual QCEW data.

When the economy was doing well during the years of the technology and equity market bubble, DOB's forecast tended to underestimate State economic activity, as measured by employment and income. But in the wake of the events of September 11, economic activity contracted significantly more than predicted, resulting in overestimation of State employment growth. Indeed, for 2003 the Budget Division forecast a modest amount of growth, but employment actually continued to fall for that year. The wage forecast errors are similar to those for employment. We note that prior to 2001, DOB used a different series to measure State wages. Therefore, forecast errors based on the former series are not included here.

Figure 5

Executive Budget Forecast Accuracy: New York Employment

One year ahead

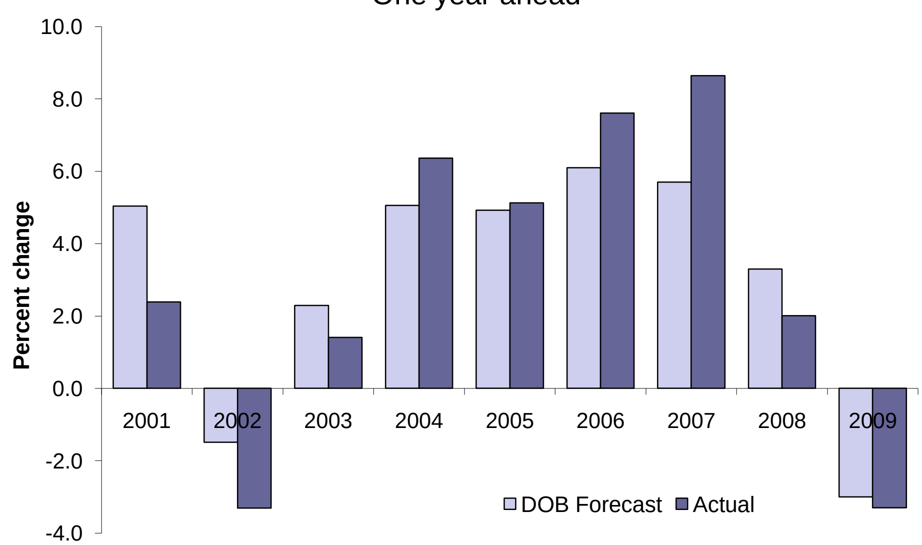


Source: NY State Labor Department; DOB staff estimates.

Figure 6

Executive Budget Forecast Accuracy: New York Wages

One year ahead



Source: NY State Labor Department; DOB staff estimates.

Forecast Accuracy for Revenues

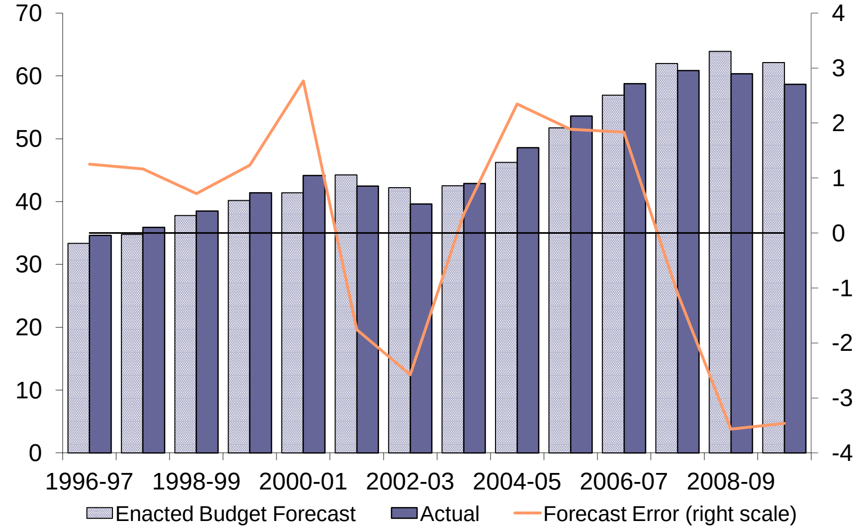
As discussed above, forecast models are simplified versions of reality and as such are subject to error. Tax collections in New York are dependent on a host of specific factors that are difficult to accurately predict. Among the more specific factors that can impact New York receipt estimates are:

- National and State economic conditions, which are subject to shocks that are by definition unanticipated;
- One-time actions (that either spin up or delay collections and impact cash flow);
- Court decisions concerning the proper applicability of tax;
- State or Federal tax policy actions that could alter taxpayer behavior;
- Tax structures including tax rates and base subject to tax;
- Efficiency of tax collection systems;
- Enforcement efforts, audit activities and voluntary compliance;
- Timing of payments (shifting collections from one fiscal year to another);
- Tax Amnesty programs (1994, 1996, 2003, and 2010 covering personal income tax, corporate franchise tax, sales tax, estate and gift tax and other minor taxes);
- Timing of Budget enactment; and
- Statutorily mandated accounting changes.

The following summary graphs review the Division's recent forecast performance using several measures. In each figure, the error is defined as the actual collections minus the forecast. Figure 7 compares the total tax forecast to actual results and presents the historical pattern of the forecast errors (2009-10 Forecast includes the estimated receipts for the Metropolitan Commuter Transportation Mobility tax which was established after the Enacted Budget). The overall pattern reflects the difficulty in forecasting at and near business cycle turning points and the tendency to overestimate receipts during recessions and to underestimate during expansions. Figure 8 shows the share of the total dollar error contributed by each major tax category. In some years, there are offsetting errors. These graphs also show that while an error rate may be significant, the dollars involved may be less so. **Error! Reference source not found.** and **Error! Reference source not found.** show the forecast errors in both dollar and percentage terms for the major tax areas.

Figure 7

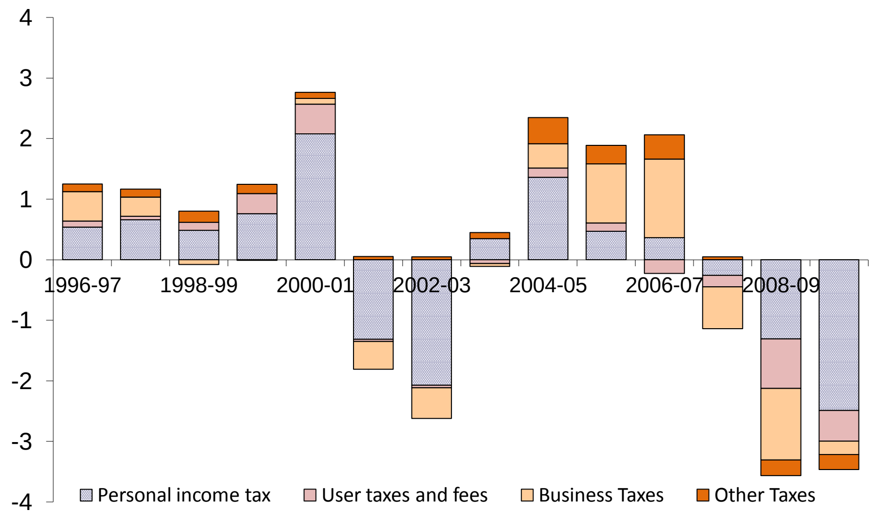
Enacted Budget Forecast Errors: Total Taxes
($ Billions)



Source: NY State Department of Taxation and Finance; DOB staff estimates.

Figure 8

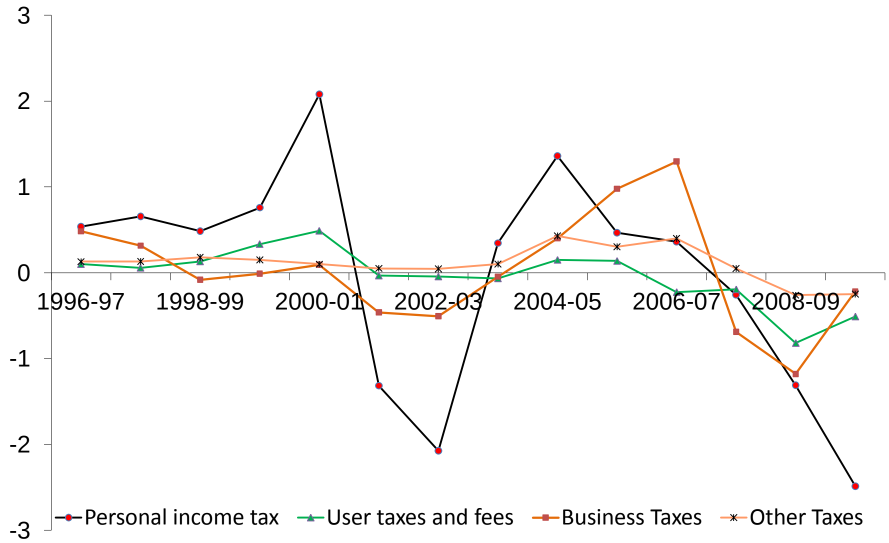
Enacted Budget Forecast Accuracy: Forecast Errors
($ Billions)



Note: Error is defined as the difference between actual and forecast.
Source: NY State Department of Taxation and Finance; DOB staff estimates.

Figure 9

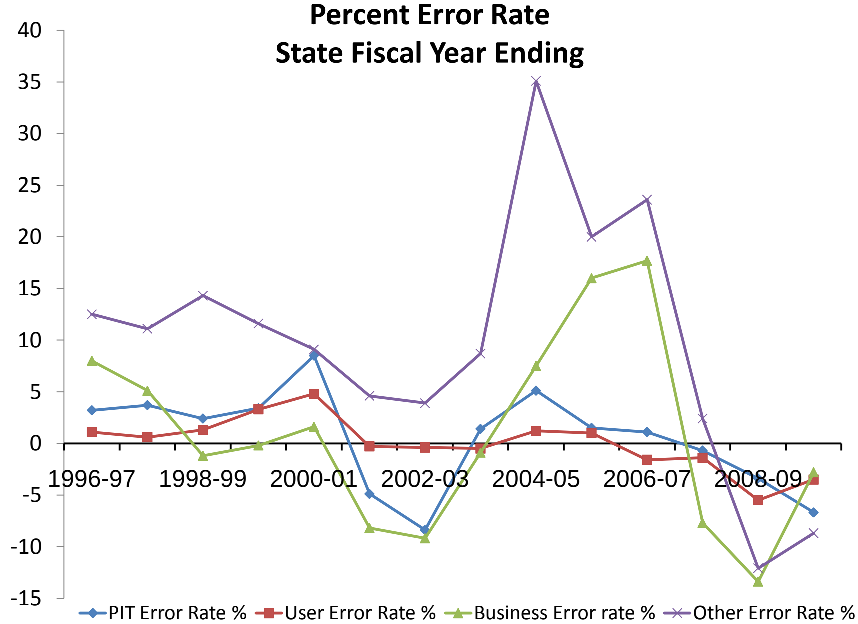
Enacted Budget Forecast Errors
($ Billions)



Note: Error is defined as the difference between actual and forecast.
Source: NY State Department of Taxation and Finance; DOB staff estimates.

Figure 10

Actual vs. Enacted
Percent Error Rate
State Fiscal Year Ending



Part I

Economic Methodologies

U.S. MACROECONOMIC MODEL

The Division of the Budget (DOB) Economic and Revenue Unit provides projections on a wide range of economic and demographic variables. These estimates are used in the development of State revenue and expenditure projections, debt capacity analysis, and for other budget planning purposes. This section provides a detailed description of the econometric models developed by the staff for forecasting the U.S. economy.

RECENT DEVELOPMENTS IN MACROECONOMIC MODELING

Macroeconomic modeling has undergone a number of important changes during the last 35 years, primarily as a result of developments in economic and econometric theory. Recent progress in macroeconomic theory has led to resolution in many areas of the historic debate between dueling theoretical camps — the Keynesians and monetarists — carried on more recently by their intellectual descendants, the so-called New Keynesians and the New Classicals. This meeting of the minds has been referred to as "the new synthesis" by Woodford (2009) and others. For practitioners, an examination of the areas where consensus has formed lends guidance as to which model features represent the state of the art of macroeconomic forecasting.[1] The Budget Division model for the U.S. economy incorporates several key elements of these advances.

The first major development was Robert Lucas' (1976) critique of the role of expectations in traditional macroeconomic models. By failing to incorporate the "rational expectations" assumption that agents are forward looking, traditional macroeconomic models could not generate forecasts consistent with a rational response by agents to a possible policy change. The result was a widespread adoption of rational expectations in macroeconomic forecasting models, with expectations evolving endogenously to changes in monetary and fiscal policy.

The Lucas analysis also initiated the emergence of a new generation of econometric models explicitly incorporating coherent intertemporal general equilibrium foundations, where firms and households are assumed to make decisions based on optimization plans that are realized in the long run. This approach permits short-term business cycle fluctuations and long-term equilibrium properties are handled within a single consistent framework. This synthesis is made possible by adding adjustment frictions, as well as other departures from the perfectly competitive, instantaneous-adjustment model. The inclusion of these departures has now become widely accepted, and in fact has become one of the most fertile — and controversial — areas of economic research.

A third development stems from the classic study by Nelson and Plosser (1982), who concluded that the hypothesis of nonstationarity cannot be rejected for a wide range of commonly used macroeconomic data series. Nonstationary time series have means and variances that change with time. Research surrounding nonstationarity prompted a revisiting of the problem of spurious regression described by Granger and Newbold

[1] Dynamic Stochastic General Equilibrium (DSGE) models directly address many of the theoretical concerns that are at the center of current debate and likely represent the next generation of large scale forecasting models. While these models are currently being tested at the Federal Reserve Board, the Congressional Budget Office, and other institutions, and have shown potential, it remains to be proven whether real time detailed forecasts from these models will ultimately stand up to those of existing macroeconomic models. For a discussion, see Edge, Kiley, and Laforte (2009).

(1974), which 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. A result has been structural forecasting models that are more directly based on the series' underlying data generating mechanism.

It is now widely accepted that monetary policy can have an impact on both inflation and the economy's equilibrium response to a real shock, and consequently the course of the business cycle. 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 generally simple rule-based approach is believed to maximize the credibility of the central bank, a key input to the effectiveness of the policy itself.

Perhaps the most popular example of an interest rate-setting rule is Taylor's rule, as proposed by John Taylor (1993). According to Taylor's rule, the monetary authority's policy choices are guided by the extent to which inflation and output deviate from target levels, though there is an ongoing debate as to the precise specification. There is mounting empirical evidence that the Federal Reserve has more vigorously pursued a policy of keeping inflation expectations well anchored since the early 1980s. This evidence suggests that a policy rule which augments actual inflation by expectations may be optimal, under most circumstances.

The last two years have been an extraordinary period for monetary policy. With the current level of slack in the economy, the Budget Division's specification of Taylor's rule prescribes an optimal interest-rate target that is well below zero. Consequently, the Federal Reserve has been compelled to turn to less conventional policy tools in pursuit of its twin mandates, price stability and full employment. However, the central bank's recent foray into quantitative easing has proven to be a challenge for forecasters given the lack of historical experience with this unprecedented mode of policy action. There is no doubt that the central bank's recent actions and their aftermath will be debated for many years to come.

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 agent-specific 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 summarized in Brayton and Tinsley (1996), the assumptions that govern the long-run behavior of DOB/U.S. are grounded in neoclassical microeconomic foundations. Consumers exhibit maximizing behavior over consumption and labor-supply decisions, while firms maximize profit. The model solution converges to a balanced growth path in the long run. Consumption is determined by expected wealth, which is determined, in part, by expected future output and interest rates. The value of investment is affected by the cost of capital and expectations about the future paths of output and inflation.

However, in addition to the microeconomic foundations governing long-run behavior, DOB/U.S. incorporates dynamic adjustment mechanisms, reflecting that even forward-looking agents do not adjust instantaneously to changes in economic conditions. Sources of "friction" within the economy include adjustment costs, the wage setting process, and persistent spending habits among consumers. Frictions delay the adjustment of nonfinancial variables, producing periods when labor and capital can deviate from their optimal paths. 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.[2] 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 six modules of estimating equations, forecasting well over 200 variables. The first module estimates real potential U.S. output, as measured by real U.S. gross domestic product (GDP). The next module estimates the formation of agent expectations, which become inputs to blocks of estimating equations in subsequent 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 third module. A fourth module produces forecasts for variables thought to be influenced primarily by exogenous forces but which, in turn, play an important role in determining the economy's other major indicators. These variables, along with the

[2] This assumption has recently been challenged in light of the role of asset price bubbles in the precipitation of the current credit crisis. Alternatively, bubbles can be viewed as long-term asset market frictions (Brunnermeier, 2001).

long-term equilibrium values estimated in the third module, become inputs to the core behavioral model, which represents the fifth block of estimating equations. The core behavioral model is the largest part of DOB/U.S. and much of the discussion that follows focuses on this block. The final module is comprised of satellite models that use core model variables as inputs, but do not feed back into the core behavioral equations.

The current estimation period for the model is the first quarter of 1965 through the second quarter of 2010, although some data series do not have historical values for the full period. Descriptions of each of the six modules follow below.

Potential Output and the Output Gap

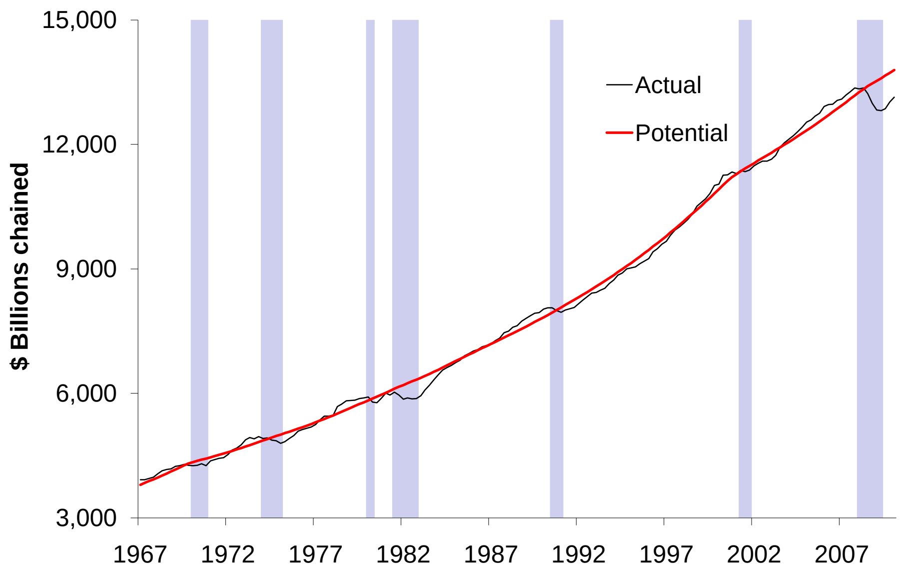
Potential GDP is one of the foundational elements of DOB/U.S., on which the model's long-term equilibrium values and monetary policy forecasts are based. Potential GDP is the level of output that the economy can produce when all available resources are being utilized at their most efficient levels. The economy can produce either above or below this level, but when it does so for an extended period, economic agents can expect inflation to rise or fall, respectively, although the precise timing of that movement can depend on a multiplicity of factors. The "output gap" is defined as the difference between actual and potential output.

The Budget Division's method for estimating potential GDP largely follows that of the Congressional Budget Office (CBO) (1995, 2001). This method estimates potential GDP for each of the four major economic sectors defined under U.S. Bureau of Economic Analysis (BEA) National Income and Product Account (NIPA) data: private nonfarm business, private farm, government, and households and nonprofit institutions. The nonfarm business sector is by far the largest sector of the U.S. economy, accounting for about 74 percent of total GDP in 2009. A neoclassical growth model is specified for this sector that incorporates three inputs to the production process: labor (measured by the number of hours worked), the capital stock, and total factor productivity. The last of these three inputs, total factor productivity, is not directly measurable. It is estimated by substituting the log-values of hours worked and capital 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. Total factor productivity is the residual resulting from a subtraction of the log value of output accounted for by labor and capital from the historical log value of output.

Each of the inputs to private nonfarm business production is assumed to contain a component that varies with the business cycle and a long-term trend component that tracks the evolution of economy's capacity to produce. Inputs are adjusted to their "potential" levels by estimating and then removing the cyclical component from the data series. The cyclical component is assumed to be reflected in the deviation of the actual unemployment rate from what economists define as the nonaccelerating inflation rate of unemployment, or NAIRU. When the unemployment rate falls below the NAIRU, indicating a tight labor market, the stage is set for higher wage growth and, in turn, higher inflation. An unemployment rate above the NAIRU has the opposite effect. Estimation of the long-term trend component presumes that the "potential" level of an input grows smoothly over time, though not necessarily at a fixed growth rate. Once the models are estimated, the potential level is defined as the fitted values from the regression, setting the unemployment rate deviations from the NAIRU equal to zero. This same method is applied to all three of the major inputs to private nonfarm business production.

To obtain a measure of potential private nonfarm business GDP, the potential levels of the three production inputs are substituted back into the production function where hours worked, capital, and total factor productivity are given coefficients of 0.7, 0.3, and 1.0, respectively. For the other three sectors of the economy, the cyclical component is removed directly from the series itself in accordance with the method used to estimate the potential levels of the inputs to private nonfarm business production. Nominal potential measures for the four sectors are also estimated by multiplying the chained dollar estimates by the implicit price deflators based on actual historical data for each quarter. The estimates for the four sectors are then "Fisher" added together to yield an estimate for total potential real U.S. GDP.[3] Figure 11 compares the DOB construction of potential GDP to actual and illustrates the severe impact of the 2007-2009 recession on national output relative to its productive potential.

Figure 11
Potential vs. Actual U.S. GDP



Note: Shaded areas represent U.S. recessions.
Source: Moody's Economy.com; DOB staff estimates.

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.

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[3] Throughout DOB/U.S., aggregates of chained dollar estimates are calculated by "Fisher adding" the component series. Correspondingly, components of chained dollar estimates constructed by DOB, such as non-computer, nonresidential fixed investment and non-oil imports, are calculated using Fisher subtraction.

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 wealth prospects. Thus, when deciding how much to spend in a given period, they consider not only their income in that period, but also their lifetime or "permanent income," as per the "life cycle" or "permanent income" hypotheses put forward by Friedman (1957) and others. In estimating their permanent incomes, consumers are assumed to use all the information available to them at the time they make purchases. Producers are also assumed to be forward-looking, basing their decisions on their expectations of future prices, interest rates, and output. However, since both households and firms experience costs associated with adjusting their long-term expenditure plans, both 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 that expectations are correct, on average, over the long-term. This is yet another assumption seemingly challenged by the subprime debt bubble and other recent events. If investors suspect a persistent mispricing of a certain class of assets, i.e., a bubble, and they know from past experience that arbitrageurs will ultimately correct the mispricing (the bubble will burst), then the rational expectations hypothesis suggests that they will engage in trades that effectively eliminate it today. Brunnermeier and Nagel (2004) present an alternate view that rests on information asymmetries, funding frictions, and other market imperfections. For example, since individual investors do not know when other investors will start trading against the bubble, they may be reluctant to "lean against the wind" because of potential lost gains. Rational investors could choose to "ride the bubble" instead, allowing the mispricing to persist. In other words, even a long-term mispricing of an asset may not be inconsistent with the rational formation of expectations. Thus, rational expectations remain a key underlying assumption in DOB/U.S.

Formally, the rational expectations hypothesis implies that the expectation of a variable Y at time t, Y_t, formed at period $t\text{-}1$, is the statistical expectation of Y_t based on all available information at time $t\text{-}1$. 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. Adaptive expectations are captured by including the term, αY_{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 the importance of expectations in forecasting is now well established, their specification continues to challenge model builders. DOB/U.S. estimates agent expectations in two stages. First, measures of expectations pertaining to three key economic variables are estimated within a vector autoregressive (VAR) framework. These expectations become part of an information set that is shared by all agents who then use them, in turn, to form expectations over variables that are specific to a particular subset of agents, such as households and firms. Details of this process are presented below.

Shared Expectations

All agents in DOB/U.S. use a common information set to form expectations. This set consists of three key macroeconomic variables: inflation as represented by the GDP price deflator, the federal funds rate, and the percentage output gap. The percentage output gap is defined as actual real GDP minus potential real GDP, divided by actual real GDP. Values for the early part of the forecast period are fixed by assumption, while values for the remaining quarters are estimated within a VAR framework, with the federal funds rate and the GDP inflation rate in first-difference form (see Table 1).

TABLE 1
HISTORICAL VAR MODEL

Federal Funds Rate (r)

$$
\begin{aligned}
\Delta r_t = & -\underset{(0.034)}{0.074}(r - r_\infty)_{t-1} + \underset{(0.063)}{0.029}(\pi - \pi_\infty)_{t-1} + \underset{(0.077)}{0.189}\,\Delta r_{t-1} - \underset{(0.078)}{0.296}\,\Delta r_{t-2} + \underset{(0.080)}{0.177}\,\Delta r_{t-3} + \underset{(0.076)}{0.033}\,\Delta r_{t-4} \\
& + \underset{(0.080)}{0.066}\,\Delta\pi_{t-1} + \underset{(0.079)}{0.190}\,\Delta\pi_{t-2} + \underset{(0.073)}{0.111}\,\Delta\pi_{t-3} + \underset{(0.062)}{0.063}\,\Delta\pi_{t-4} \\
& + \underset{(0.086)}{0.323}\,\chi_{t-1} - \underset{(0.129)}{0.154}\,\chi_{t-2} - \underset{(0.126)}{0.167}\,\chi_{t-3} + \underset{(0.087)}{0.051}\,\chi_{t-4}
\end{aligned}
$$

Adjusted $R^2 = 0.22$

GDP Deflator (π)

$$
\begin{aligned}
\Delta \pi_t = & -\underset{(0.042)}{0.052}(r - r_\infty)_{t-1} - \underset{(0.079)}{0.086}(\pi - \pi_\infty)_{t-1} + \underset{(0.096)}{0.213}\,\Delta r_{t-1} + \underset{(0.097)}{0.082}\,\Delta r_{t-2} + \underset{(0.099)}{0.010}\,\Delta r_{t-3} + \underset{(0.094)}{0.078}\,\Delta r_{t-4} \\
& - \underset{(0.100)}{0.480}\,\Delta\pi_{t-1} - \underset{(0.097)}{0.312}\,\Delta\pi_{t-2} - \underset{(0.091)}{0.204}\,\Delta\pi_{t-3} + \underset{(0.077)}{0.022}\,\Delta\pi_{t-4} \\
& + \underset{(0.106)}{0.080}\,\chi_{t-1} - \underset{(0.161)}{0.023}\,\chi_{t-2} - \underset{(0.157)}{0.088}\,\chi_{t-3} - \underset{(0.108)}{0.017}\,\chi_{t-4}
\end{aligned}
$$

Adjusted $R^2 = 0.23$

Percentage Output Gap (χ)

$$
\begin{aligned}
\chi_t = & -\underset{(0.029)}{0.022}(r - r_\infty)_{t-1} - \underset{(0.054)}{0.032}(\pi - \pi_\infty)_{t-1} + \underset{(0.066)}{0.123}\,\Delta r_{t-1} - \underset{(0.067)}{0.296}\,\Delta r_{t-2} + \underset{(0.068)}{0.111}\,\Delta r_{t-3} - \underset{(0.064)}{0.061}\,\Delta r_{t-4} \\
& + \underset{(0.068)}{0.091}\,\Delta\pi_{t-1} + \underset{(0.067)}{0.084}\,\Delta\pi_{t-2} - \underset{(0.062)}{0.019}\,\Delta\pi_{t-3} - \underset{(0.053)}{0.036}\,\Delta\pi_{t-4} \\
& + \underset{(0.073)}{1.210}\,\chi_{t-1} - \underset{(0.110)}{0.066}\,\chi_{t-2} - \underset{(0.108)}{0.218}\,\chi_{t-3} - \underset{(0.074)}{0.007}\,\chi_{t-4}
\end{aligned}
$$

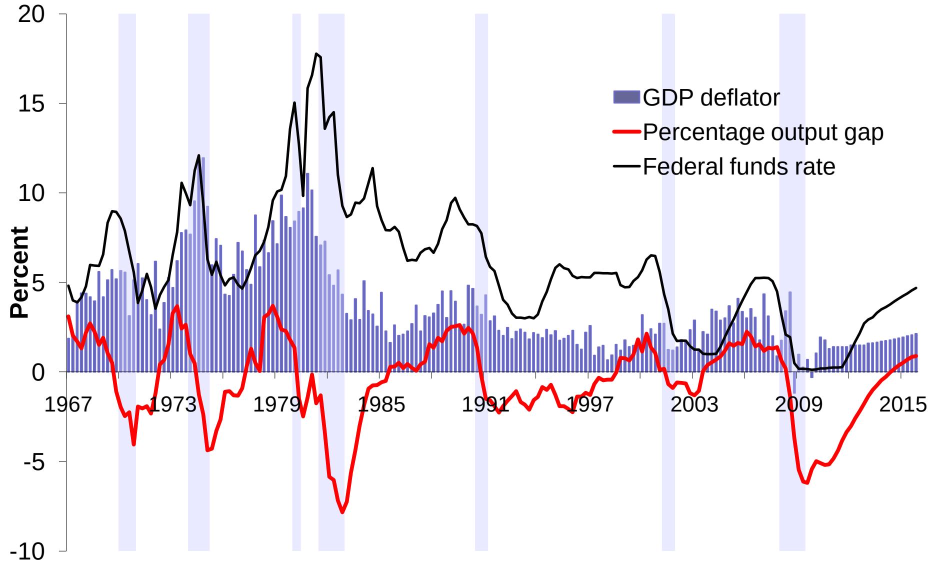
Adjusted $R^2 = 0.90$

Number of Obs = 461

Note: The subscript '∞' is used to indicate the endpoint condition; for the percentage output gap, the endpoint condition stipulates a long-run value of zero.Values in parentheses under coefficients represent standard errors.

The long-run values of the three variables are constrained by "endpoint" conditions. Restrictions for the federal funds rate and inflation are represented by the first two terms on the right-hand side of each equation in Table 1, while the assumption that the percentage output gap becomes zero in the long run is implied and therefore does not appear explicitly in the equations. 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. Figure 12 illustrates how the three variables that comprise shared expectations converge to their long-term equilibrium values over time. Once the core behavioral model is solved, there is feedback from the model solutions for these critical variables back to the shared expectations module in order to capture the endogenous evolution of expectations in a model-consistent fashion and the entire model is resolved.

Figure 12
Shared Expectations



Note: Shaded areas represent U.S. recessions.
Source: Moody's Economy.com; DOB staff estimates.

Agent-Specific Expectations

The common information set is augmented by expectations pertaining to agents in specific sectors. For example, households base their consumption decisions on the expected lifetime accumulation of income and wealth. Therefore, the household-specific information set includes expectations over the components of real disposable personal income and after-tax values of securities- and nonsecurities-related wealth. Similarly, the firm sector-specific information set includes expectations over the relative prices of investment goods.

Long-Term Equilibrium Determination

The economy's long-term equilibrium is derived from a set of conditions that result from the optimizing behavior of economic agents, without regard for short-term adjustment costs. In the case of equilibrium consumption, households are assumed to be utility maximizers subject to a lifetime income constraint. Firms are assumed to maximize profits subject to a constant-returns-to-scale production function, and are assumed to exhibit price-taking behavior.

Equilibrium Consumption

In the household sector, optimizing behavior is based on a life-cycle model in which consumers maximize the present discounted value of their expected lifetime utility. Risk-averse consumers who have unconstrained access to capital markets will tend to smooth their consumption spending over time, by borrowing, saving, or dissaving as circumstances demand, based on an estimate of expected future lifetime resources, commonly referred to as "permanent income." Expected permanent income is comprised of the present discounted value of current and future real disposable income plus the value of household wealth. In DOB/U.S., the expected value of household permanent income for each quarter in the forecast period is approximated by a relatively stable share of expected potential GDP plus expected values for securities-related and nonsecurities-related wealth. The expected values for all of the components of permanent income are determined in the agent-specific expectations module.

Real disposable income is comprised of several income sources, including labor income, property income (including income from interest and dividends), and transfer income. For relatively young working-age household members, labor income will constitute a large share of permanent income, whereas for those in retirement, property and transfer income will predominate. Therefore, the precise composition of aggregate permanent income at any given point in time will depend on the age profile of the U.S. household population. Since this age profile varies over time, the various components of permanent income enter the equation for long-term equilibrium consumption separately. In addition, this equation includes the current and lagged values of the output gap, capturing the notion that the rate at which households discount future income may depend on household perceptions of income risk, which in turn is assumed to vary with the business cycle. In DOB/U.S., the variation in long-term equilibrium consumption is assumed to be best approximated by the variation in those components of total consumption that tend not to exhibit extreme volatility over the course of the business cycle, namely services and nondurable goods.[4]

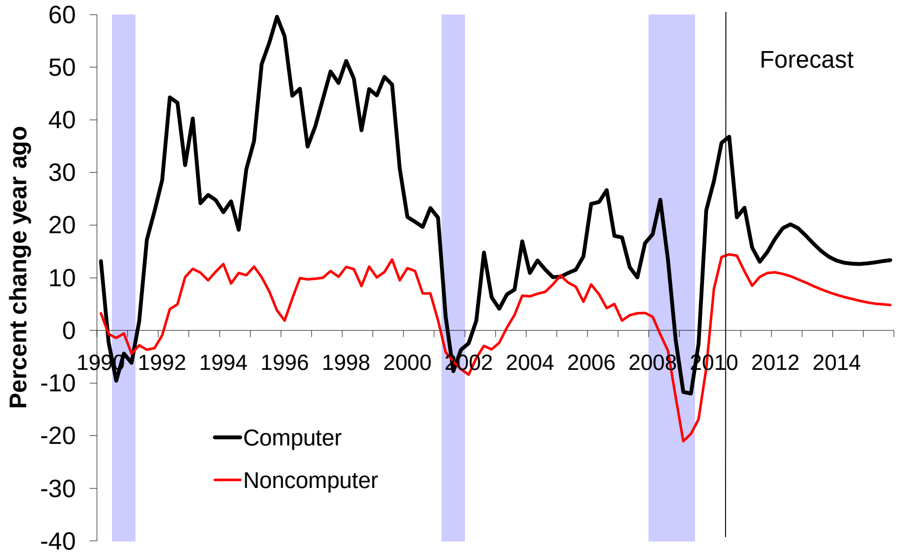
Equilibrium Investment in Producer Durable Equipment

Between 1992 and 2000, nonresidential investment in producer durable equipment and software grew at an average annual rate of 12.5 percent. At the time, most econometric models failed to capture this persistent and significant growth. Tevlin and Whelan (2000) postulate two reasons as to why so many failed to capture the late 1990s investment boom. First, the average depreciation rate for producer durable equipment increased dramatically as computers grew as a share of the total. The rapid rate of advancement in digital technology rendered computer and related equipment obsolete in just a few years. Indeed, the depreciation rate for computers and related equipment is more than twice that for other equipment.[5] Secondly, investment became more sensitive to the user cost of capital. In order to address these problems, DOB/U.S. estimates investment in computer equipment separately from the remainder of producer durable

[4] A "Fisher addition" of nondurable and services consumption produces the noncyclical component of total consumption.
[5] See Fraumeni (1997).

equipment.[6] Figure 13 compares the growth in the two investment components since 1990.

Figure 13
Real Producer Durable Equipment Growth



Note: Shaded areas represent U.S. recessions.
Source: Moody's Economy.com; DOB staff estimates.

Profit-maximizing behavior dictates that the long-term rate of equilibrium investment is the rate of investment that maintains the optimum capital-output ratio. Assuming a standard Cobb-Douglas production function, the optimal capital-output ratio will be proportional to the ratio of the price of output to the rental rate of capital. This relationship holds for both types of producer durable equipment. Given this optimal ratio, desired growth in investment varies with output growth and changes in the rental rate of capital.

For each type of equipment, the rental rate of capital is defined as its purchase price, represented by the implicit price deflator, multiplied by the sum of the financial cost of capital and the rate of depreciation. The financial cost of capital, a measure of the cost of borrowing in equity and debt markets, is estimated by giving equal weight to an estimate of the after-tax cost of equity and the yield on Moody's Baa-rated corporate bonds.[7] As discussed above, different rates of depreciation are used for computer and noncomputer equipment.

[6] 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.

[7] The series that estimates the after-tax cost of borrowing in the equity market is created by Global Insight.

Equilibrium Prices, Productivity, Wages, and Hours Worked

In equilibrium, the price level is determined by the condition that in competitive markets price equals marginal cost. Long-run productivity growth is determined by a time series model reflecting the belief that its own recent history is the best predictor of future growth. Long-term equilibrium nominal wage growth is determined by the sum of trend productivity growth and the long-term expected rate of inflation. The desired level of man-hours worked is constructed by dividing potential real GDP by trend labor productivity.

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 30 such variables, whose 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 NIPA concepts.

The Core Behavioral Module

The core behavioral module contains 118 estimating equations, of which 33 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, 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, and labor supply. Following Brayton and Tinsley (1996), DOB/U.S. assumes the existence of two groups of consumers. The larger class consists of forward-looking, utility-maximizing consumers whose consumption decisions are constrained by their permanent incomes as defined above. Implicit in the model is the recognition that this group of households is heterogeneous, representing various stages of the lifecycle. The second group is comprised of low-income households, who are assumed to base their consumption decisions on current-period income rather than permanent income. Such behavior may arise because of credit market constraints that prevent these households from borrowing for the purpose of smoothing their spending over time. Consequently, such households are referred to as “liquidity constrained.”

The four 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. 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 and adjustment costs. The equations for the determination of cyclical consumption, noncyclical consumption, and housing investment appear in Table 2. Brief descriptions of the equations follow:

TABLE 2
HOUSEHOLD SECTOR

Noncyclical Consumption

$$\Delta \ln C1_t = \underset{(0.001)}{0.004} + \sum_{\tau=0}^{5} EZQC_{t+\tau} + \underset{(0.022)}{0.022}(\ln QC - \ln C1)_{t-1} + \underset{(0.066)}{0.230}\Delta \ln C1_{t-1} + \underset{(0.031)}{0.132}\left(\Delta \ln Y_t - \sum_{\tau=0}^{5} EZQC_{t+\tau}\right)$$
$$-\underset{(6.1)}{25.1}\sum_{\tau=0}^{5} EZGAP_{t+\tau} + \underset{(0.029)}{0.064}\Delta \ln Y_{t-3} - \underset{(0.003)}{0.010}\, D1980Q2_t + \underset{(0.000016)}{0.000022}\, SLACB_t$$

Adjusted $R^2 = 0.46$

Cyclical Consumption

$$\Delta \ln C2_t = \sum_{\tau=0}^{5} EZQC_{t+\tau} + \underset{(0.001)}{0.003}(\ln QC - \ln C2)_{t-1} - \underset{(0.0653)}{0.326}\Delta \ln C2_{t-1} + \underset{(0.190)}{0.565}\Delta \ln Y_t$$
$$+\underset{(0.040)}{0.179}\Delta \ln INVH_t - \underset{(0.020)}{0.098} D1970Q4_t - \underset{(0.020)}{0.087} D1974Q4_t - \underset{(0.022)}{0.062} D1980Q2_t$$
$$-\underset{(0.021)}{0.066} D1981Q4_t - \underset{(0.020)}{0.087} D1987Q1_t + \underset{(0.020)}{0.088} D2001Q4_t + \underset{(0.00009)}{0.00054}\, SLACB_t$$

Adjusted $R^2 = 0.58$

Residential Fixed Investment

$$\Delta INVH_t = -\underset{(4.9)}{14.9} + \sum_{\tau=0}^{5} EZQC_{t+\tau} + \underset{(0.417)}{0.946}(QC / INVH)_{t-1} + \underset{(0.056)}{0.588}\, INVH_{t-1}$$
$$+\underset{(0.048)}{0.202} SLACB_t + \underset{(0.155)}{0.384}\Delta PSH_t + \underset{(0.017)}{0.031}\Delta Y_t$$
$$+\underset{(6.5)}{28.7}\, D1980Q2Q3Q4_t + \underset{(10.7)}{39.2} D1976Q4_t + \underset{(10.7)}{31.6} D1977Q2_t$$

Adjusted $R^2 = 0.64$

Banks' Willingness to Lend to Consumers

$$SLACB_t = \underset{(0.055)}{0.646}\, SLACB_{t-1} - \underset{(0.908)}{7.547}\, \Delta LIBOR3_t + \underset{(113.4)}{549.8}\, \Delta \ln GDPR_t$$

Adjusted $R^2 = .61$

Number of Obs = 171

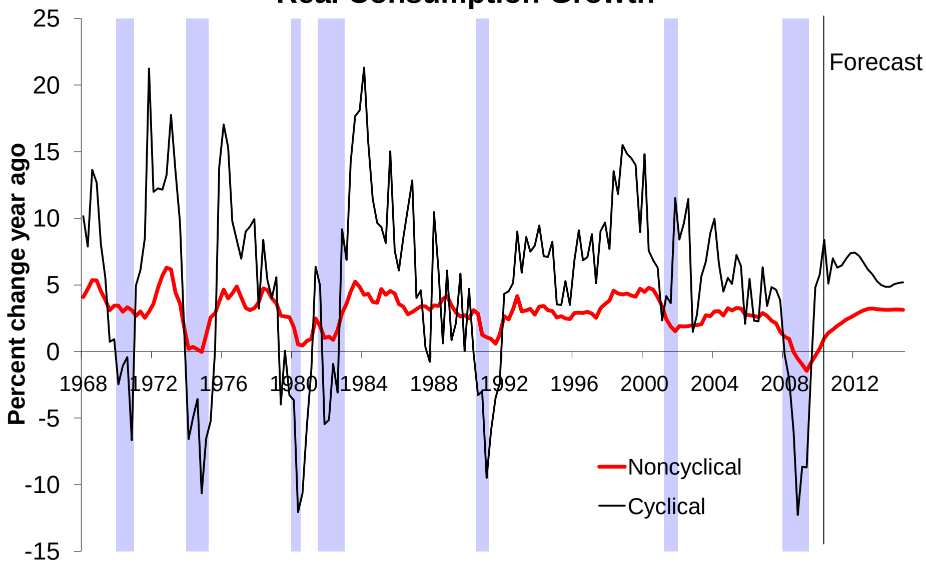
Note: Values in parentheses under coefficients represent standard errors.

C1	Real noncyclical consumption
C2	Real cyclical consumption
QC	Desired real noncyclical consumption
Y	Real disposable personal income
EZQC	Expected desired noncyclical consumption
EZGAP	Expected potential GDP gap
SLACB	Willingness to lend to consumers
INVH	Residential fixed investment
PSH	Real new home price
EEAP	U.S. Private Employment
LIBOR3	3-month libor rate
GDPR	Real GDP

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 (see Figure 14). 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 long-run equilibrium, a lagged dependent variable that captures habit persistence, forward expectations of both desired noncyclical consumption and the output gap, and real income. The latter 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 second expectations term 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.

Figure 14
Cyclical vs Noncyclical
Real Consumption Growth



Note: Shaded areas represent U.S. recessions.
Source: Moody's Economy.com; DOB staff estimates.

RESIDENTIAL FIXED INVESTMENT

Residential investment by households is estimated using a dynamic adjustment equation, which assumes that households adjust their rate of housing investment in accordance with a long-term equilibrium relation between desired noncyclical consumption and housing services. A home price variable is also included in order to capture features of both supply and demand in the housing market. 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, bank willingness to lend to consumers, and the real average price of one-family homes sold.

BANK WILLINGNESS TO LEND

Also appearing in Table 2 is the forecasting model for bank willingness to lend to consumers from the Federal Reserve Board Senior Loan Officer Survey, which captures the impact on consumer spending of credit market conditions beyond what the interest rate alone can capture. The model specification for bank willingness to lend includes its own lag, the 3-month LIBOR rate to account for interbank lending costs, and real GDP growth to account for default risk, which is assumed to be inversely related to economic growth.

LABOR SUPPLY

Households must make decisions about how much labor they supply to the labor market. In DOB/U.S., the behavioral equation which determines the first difference of the labor force participation rate includes its own lags; real GDP lagged three quarters; a dummy variable capturing the influx of women into the labor market in the 1960s, 1970s, and 1980s; and dummy variables capturing the extraordinary increases in hiring census workers in the first quarters of 1990, 2000, and 2010 for the decennial censuses. 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).

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 the two components of nonresidential fixed investment, private nonresidential structures, labor demand, real wages, and output prices. Like the behavioral equations describing the household sector, several of the firm-sector equations incorporate both error-correction terms to capture the impact of long-term equilibrium relationships and 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 and software, investment in all other equipment, and investment in nonresidential structures. The estimating equations for investment in computer and related equipment and all other equipment are virtually identical. Both equations contain an error-correction term, defined as a lag difference between equilibrium and current investment, an autoregressive term, forward expectations of equilibrium investment, and the appropriate rental rate of capital, as defined above. Longer lags yield a superior fit in the equation for noncomputer equipment due to its relatively low depreciation rate. In addition, the computer equipment equation contains the first difference of potential GDP growth and a dummy variable to capture the large decline in investment during the second and third quarters of 2001. The equation for noncomputer equipment contains the current period value for the output gap. Investment in nonresidential structures is determined by its own rental rate, real U.S. GDP growth, as well as its own past values and dummy variables.

TABLE 3
FIRM SECTOR: NONRESIDENTIAL FIXED INVESTMENT

Computer and Related Equipment

$$\underset{(0.85)}{\Delta ICO_t = -\ 4.75} \sum_{\tau=0}^{5} EQICO_{t+\tau} + \underset{(0.045)}{0.132}\ (QICO - ICO)_{t-1} + \underset{(0.094)}{0.108}\ \Delta ICO_{t-1} + \underset{(0.018)}{0.119}\ \Delta POTGDP_t$$

$$-\ \underset{(0.021)}{0.010}\ \Delta RRC_{t-1} - \underset{(1.440)}{11.907}\ Y2KD_t + \underset{(0.116)}{4.54}\ AR1_t$$

$Adjusted\ R^2 = 0.69$

Noncomputer Equipment

$$\Delta IEXCO_t = \underset{(1.21)}{3.23} + \sum_{\tau=0}^{5} EQIEXCO_{t+\tau} + \underset{(0.020)}{0.061}\ (EQIEXCO - IEXCO)_{t-2} + \underset{(0.075)}{0.256}\ \Delta IEXCO_{t-2}$$

$$+\ \underset{(0.448)}{0.975}\ GDPGAP_t - \underset{(181)}{446}\ \Delta RRO_{t-2} - \underset{(6.2)}{20.7}\ Y2KD_t + \underset{(0.083)}{0.171}\ AR1_t + \underset{(0.087)}{0.239}\ AR3_t$$

$Adjusted\ R^2 = 0.42$

Structures

$$\Delta \ln IS_t = \underset{0.067}{0.240}\, \Delta \ln IS_{t-1} + \underset{0.067}{0.222}\, \Delta \ln IS_{t-2} + \underset{0.174}{0.643}\ \Delta \ln GDP_t - \underset{0.072}{0.174}\, \Delta \ln RRS_{t-3}$$

$$+\ \underset{0.134}{0.201}\ \Delta \ln RRO_t - \underset{(0.023)}{0.100}\ D1886Q2_t - \underset{(0.022)}{0.104}\ D2001Q4_t + \underset{(0.024)}{0.069}\ D1978Q2_t$$

$Adjusted\ R^2 = 0.43$

$Number\ of\ Obs = 171$

Note: Values in parentheses under coefficients represent standard errors.

ICO	Nonres. fixed investment – computer and related equipment
EQICO	Expected desired computer investment
QICO	Desired computer investment – durable equipment
POTGDP	Potential GDP
RRC	Rental rate – computers
Y2KD	Post-Y2K dummy for 2001
AR1	First-order autocorrelation correction
IEXCO	Nonres. fixed investment – durable equip. excl. computers
EQIEXCO	Expected future desired investment – durable equip. excl. computers
QIEXCO	Desired investment – durable equip. excl. computers
GDPGAP	Percent real GDP gap
RRO	Rental rate of capital – other durable equipment
AR3	Third-order autocorrelation correction
IS	Nonres. fixed investment – structures
GDP	Real GDP
RRS	Rental rate – structures
D1986Q2	Dummy for Tax Reform Act of 1986
D2001Q4	Dummy for retroactive provision of Job Creation and Worker Assistance Act of 2002

LABOR DEMAND: HOURS WORKED AND EMPLOYMENT

In DOB/U.S., the level of national employment is determined by estimating equations for the number of hours worked and the length of the average workweek, which together capture the nonfarm private business sector's demand for labor. Total employment, in turn, affects the movements of many other economic variables, such as output, wages, consumption, and inflation. Hours worked are estimated using a dynamic adjustment equation that includes an error-correction term composed of the difference between long-term equilibrium hours and actual hours, real U.S. GDP growth, the expected one-period-ahead value of the output gap, and dummy variables.

The estimating equation for the average length of the workweek in the private nonfarm business sector also contains an error-correction term and the expected one-period-ahead value of the output gap. In addition, the model includes growth in real private nonfarm business GDP and dummy variables. The level of total private nonfarm employment is determined by dividing hours worked by the average length of the workweek multiplied by the number of weeks in a year.

THE WAGE RATE

The average hourly wage rate is defined as total private employee compensation (cash wages and salaries plus additional costs such as medical insurance premiums and employer contributions for social insurance) divided by hours worked. The long-run equilibrium growth in the wage rate is assumed to depend on trend productivity growth and the inflation rate, where inflation is measured by the private nonfarm chain-weighted GDP deflator and productivity is private nonfarm output divided by hours worked adjusted to remove the effects of the business cycle. Thus, the equilibrium 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 in an error-correction framework but contains additional lags capturing the presence of "wage-stickiness." The model also includes the expected one-period-ahead value of the output gap to capture the impact of forward-looking behavior on the speed of adjustment toward equilibrium.

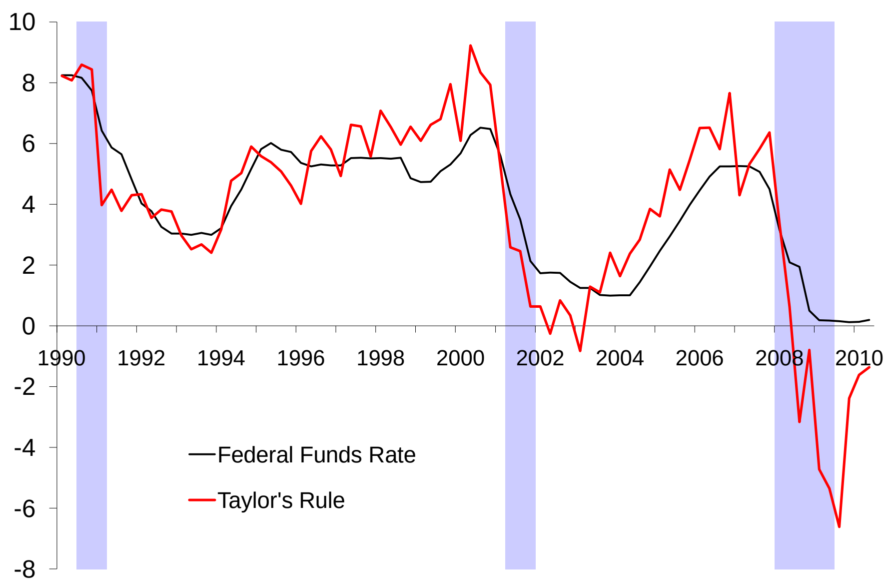
OUTPUT PRICES

The price level is represented by the private nonfarm chain-weighted GDP deflator. Its growth is modeled within a dynamic adjustment framework in which the price level adjusts gradually from its current level to its long-term equilibrium value. The model also includes the expected one- and two-period-ahead values of the output gap, again to capture the impact of forward-looking behavior on the speed of adjustment toward equilibrium. In addition, the model contains the petroleum products component of the Producer Price Index (PPI) to capture the impact of wholesale energy prices, as well as dummy variables to capture the impact of the 1970s oil shocks above and beyond what is captured by the PPI.

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 economy's performance – as reflected in the behavior of inflation, output, and employment – by balancing the twin goals of full employment and price stability. 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 their twin goals. Taylor's rule is a federal funds rate reaction function that responds to the deviation of inflation from its long-term target level and to the deviation of output growth from its potential level. The rule also yields a "normative prescription" for the direction of future policy.[8] As illustrated in Figure 15, 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, recent experience highlights the challenge to the central bank when the target approaches the zero lower bound.

Figure 15
Federal Funds Rate vs. Rate Implied by Taylor's Rule



Note: Shaded areas represent U.S. recessions.
Source: Moody's Economy.com; DOB staff estimates.

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 its stabilization policy. No intermediate targets are 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

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

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. Deviations from the Federal Reserve's assumed inflation target are weighed twice as heavily as deviations from its output growth target, i.e., inflation deviations have a weight of one while output-growth deviations have 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 makes operational 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.

TABLE 4
MONETARY POLICY: TAYLOR'S RULE

$$r_T = \bar{\pi}_t + R_t + 1(\bar{\pi}_t - \pi_T) + 0.5(\bar{g}_t - g_T)$$

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

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

$$\textit{where,} \quad R_t = r_t - \pi_t$$

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

DOB/U.S. also contains equations that estimate the contribution to GDP from Federal, state and local governments. Spending by both the Federal government and state and local governments depends on the revenues they collect. Although government revenues come from various sources – the personal income tax, the sales tax, corporate business taxes, and fees – we find that personal income tax revenues act as an adequate proxy for revenues from all these sources. Since the components of personal income grow at varying rates, the models for both Federal and state and local revenues include these components separately, as well as effective tax rates. All government sector variables are modeled in first-differenced logarithmic form.

Since government receipts are only available in nominal terms, final demand by the government sector is modeled in nominal terms as well. Real spending is calculated by deflating these nominal values by the appropriate price deflators. Because governments determine their budgets before they know how much revenue they will collect, they do not adjust quickly to current revenue shocks. In addition, Federal government spending is not constrained in the short run by contemporaneous-year revenues. Therefore, government spending models include past revenues with lags up to seven quarters, as well as the current period nonfarm GDP price deflator. The Federal government spending model also includes the percentage GDP gap, capturing the countercyclicality of spending. Since employee compensation accounts for most of the state and local government contribution to final demand, the spending model also includes government employment.

In addition, DOB/U.S. estimates the impact of changes in fiscal policy on the macroeconomy. Because 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, such as in 2001 and 2003. For this purpose, DOB/U.S. combines the most recent Joint Committee on Taxation and CBO 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 subdivided 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.

In addition to the federal funds rate, which is modeled based on Taylor's rule, DOB/U.S. contains models for six interest rates: the three-month, one-year, five-year, and ten-year U.S. Treasury securities rates, as well as the Baa corporate bond rate and the 30-year conventional mortgage rate. These equations are specified within an error-correction framework based on the expectations theory of the term structure of interest rates, which posits that the yield on the 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 one-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. A real GDP gap term is added to most of the equations to capture the impact of expected (future) inflationary pressures on the current yield curve.

The Foreign Sector

Real U.S. exports are determined by the level of foreign economic activity, as measured by an estimate of the growth rate of global GDP and U.S. export prices relative to foreign prices. Real imports are divided into non-oil and oil goods and services. Non-oil imports are a function of real domestic demand and the ratio of import prices to domestic prices. Oil imports are a function of real domestic demand, as well as oil prices relative to domestic prices. Both imports and exports equations contain additional dummy variables to capture one-time shocks, such as the September 11 terrorist attacks and the oil shocks of the 1970s.

Satellite Model

Sectoral Employment

Total employment is disaggregated into 20 industrial sectors based on the North American Industry Classification System (NAICS). Individual equations incorporate "structural" variables that are forecast in prior modules, such as hours worked, real GDP, real personal income, the S&P 500 adjusted for inflation, interest rates, and demographic variables. The general approach is to estimate an error-correction model, although the error-correction term is dropped if it is not significant. Some of the sectors are modeled in differences from the year-ago level to remove seasonality. In order to capture seasonality in those sectors that were modeled in first differences, we add time-variant seasonal dummy variables, which are constructed using the X11 procedure developed by the U.S. Census Bureau.

Nominal Consumption Detail

DOB forecasts 16 detailed components of nominal consumption expenditures for the purpose of forecasting sales tax receipts (see the "Sales and Use Tax" section). Three examples of these forecasting models are presented in Table 5. All models are in first-differenced log form.

The three major components of consumption expenditures are durable goods, nondurable goods, and services. To help ensure that the detailed components add up to the projected totals, either the total or a function of the total appears on the right-hand side and is retained if the coefficient is statistically significant. For example, total durable consumption spending less spending on motor vehicles and parts is on the right-hand side of furnishings and durable household equipment spending. Also included are its own lagged value, fixed residential investment, bank willingness to lend, and some dummy variables to account for large shocks that the other explanatory variables cannot account for. Given that the impact of credit market conditions are already to some extent accounted for by total durable spending, the negative coefficient on bank willingness to spend may be an indication that this component is less sensitive to credit market conditions than the total less spending on motor vehicles and parts.

The model specification for consumer spending for gasoline and other energy goods includes total nondurable consumption, of which it is a component, the energy goods component of the Producer Price Index (PPI) for finished goods, and bank willingness to lend. The model specification for consumer spending for transportation services includes total services consumption less spending for medical, housing, and financial services; the energy goods component of the PPI for finished goods; bank willingness to lend; and total private sector employment to capture changes in aggregate demand.

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 PPI for refined petroleum products and other implicit price deflators for consumption are used to forecast several components of the PPI.

TABLE 5
SELECTED CONSUMPTION MODELS

$$\Delta \ln CDFHEQ_t = \underset{(0.0007)}{-0.0006} + \underset{(0.038)}{0.836}\ \Delta \ln\left(CD_t - CDMVPQ_t\right) + \underset{(0.013)}{0.066}\ \Delta \ln IFIXR_t + \underset{(0.032)}{0.057}\ \Delta \ln CDFHEQ_{t-1}$$
$$- \underset{(0.00003)}{0.00008}\ SLACB_t - \underset{(0.005)}{0.026}\ D1986Q4_t + \underset{(0.005)}{0.021}\ D1989Q1_t$$

$Adjusted\ R^2 = .90$

$$\Delta \ln CNGFOQ_t = \underset{(0.003)}{-0.017} + \underset{(0.274)}{1.916}\ \Delta \ln CN_t + \underset{(0.028)}{0.421}\ \Delta \ln WPI057_t + \underset{(0.0001)}{0.00014}\ SLACB_t$$

$Adjusted\ R^2 = .91$

$$\Delta \ln CSTRSQ_t = \underset{(0.002)}{-0.003} + \underset{(0.126)}{0.733}\ \Delta \ln\left(CS_t - CSMEDQ_t - CSHHOQ_t - CSFIQ_t\right) - \underset{(0.008)}{0.015}\ \Delta \ln WPI057_{t-1}$$
$$+ \underset{(0.081)}{0.165}\ \Delta \ln CSTRSQ_{t-1} + \underset{(0.00005)}{0.0001}\ SLACB_t + \underset{(0.201)}{0.693}\ \Delta \ln EEAP_t$$

$Adjusted\ R^2 = .65$

Number of Obs = 122

Note: Values in parentheses under coefficients represent standard errors.

CDFHEQ	PCE: Furnishings and Durable Household Equipment
CD	PCE: Durable Goods
CDMVPQ	PCE: Motor Vehicle and Parts
IFIXR	Residential Investment
SLACB	Willingness to lend to consumers
D1986Q4	Dummy (=1 for 1986Q4; 0 otherwise)
D1989Q1	Dummy (=1 for 1989Q1; 0 otherwise)
CNGFOQ	PCE: Gasoline and Other Energy Goods
CN	PCE: Nondurable Goods
WPI057	PPI: Finished Energy Goods
SLACB	Willingness to lend to consumers
CSTRSQ	PCE: Transportation Services
CS	PCE: Services
CSMEDQ	PCE: Medical Services
CSHHOQ	PCE: Housing Services.
CSFIQ	PCE: Financial Services
WPI057	PPI: Finished Energy Goods

Nonpersonal Service Inflation

DOB provides forecasts for 32 detailed sub-components specifically for the purpose of forecasting the nonpersonal service (NPS) expenditure component of the State budget. Since these forecasts are used by many different units within the Division for fiscal planning purposes, most are modeled on a State fiscal year basis. This set of forecast variables includes price deflators for medical equipment, office equipment, office supplies, energy-related products, business services, and real estate rentals. Right-hand-side variables for these models include the DOB/U.S. forecasts for price indices described above. For example, the price index for light fuel oil explains much of the variation in the index for home heating oil. Likewise, the price index for medical equipment is well represented by the price index for total medical care excluding medical services and drugs and medical supplies. All three of the latter measures are forecast within DOB/U.S. Table 6 presents model specifications for these two variables.

TABLE 6
SELECTED PRICE DEFLATORS

Home Heating Oil

$$\Delta \ln WPI057302_t = \underset{(0.0013)}{-\,0.0002} + \underset{(0.011)}{0.997}\ \Delta \ln WPI0573_t$$

Adjusted $R^2 = 0.99$

Number of Obs $= 122$

Medical Equipment

$$\Delta \ln CPIUEMB_t = \underset{(0.0060)}{-\,0.0088} + \underset{(1.738)}{8.022}\ \Delta \ln CPIMED_t - \underset{(1.527)}{6.265}\ \Delta \ln CPISVMED_t - \underset{(0.243)}{0.807}\ \Delta \ln CPIUEMA_t$$

Adjusted $R^2 = 0.89$

Number of Obs $= 30$

Note: Values in parentheses under coefficients represent standard errors.

WPI057302	PPI - Fuel oil #2 home heating oil
WPI0573	PPI - Light fuel oils
XCPIUEMB	CPI - Medical Equipment
CPIMED	CPI - Medical care
CPISVMED	CPI - Medical services
CPIUEMA	CPI - Drugs and medical supplies

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, London Inter Bank Offering Rate (LIBOR) 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.

Current Quarter Estimation

The DOB/U.S. macroeconomic models described above are all quarterly models, consistent with their primary data source, the National Income and Product Accounts

(NIPA) data provided by the U.S. Department of Commerce Bureau of Economic Analysis (BEA). However, BEA's quarterly estimates are themselves based on data compiled, generally at a monthly frequency, by the U.S. Department of Labor Bureau of Labor Statistics (BLS), the U.S. Department of Commerce Census Bureau, and BEA itself. Much of these data, though not all, are reported to the public. The purpose of the Budget Division's current quarter tracking system is to make maximum use of the available high frequency information at the time a forecast is made. This process allows DOB to more accurately estimate the base quarters for both real and nominal U.S. GDP, as well as U.S. personal income. Since the DOB/U.S. models discussed above tend to project equilibrium relationships assuming no exogenous shocks, the projected annual growth rate for the near term is heavily dependent upon the base quarter estimate. Hence, the accuracy of the base quarter is crucial to the accuracy of the overall forecast.

For each quarter, BEA produces three estimates in the months immediately following the quarter – an initial release followed by two revisions. These estimates are followed by at least three more annual revisions, typically released in July of each year. In addition, BEA periodically releases a more comprehensive revision which includes an update of the reference year upon which measures of real activity are based. As an example, Table 7 presents a chronology of BEA's first three releases of NIPA estimates, since these estimates are the most relevant to the Budget Division's current quarter estimation, for the four quarters of 2009. As the table indicates, the initial estimate for any given quarter is released at the end of the first month of the following quarter. For example, the first release of the estimate for the first quarter of 2009, known as the "advance" release, was available at the end of April 2009. With the second or "preliminary" release, made public by BEA at the end of May 2009, the first quarter estimate underwent the first of many revisions. The second revision of 2009Q1 was reported with the third or "final" release, at the end of June. Not included in the table is the first annual revision, which was released at the end of the following July.

TABLE 7
NIPA RELEASE SCHEDULE FOR THE FOUR QUARTERS OF 2009

Release	**2009Q1**	**2009Q2**	**2009Q3**	**2009Q4**
Advance Estimate	Apr. 29, 2009	Jul. 31, 2009	Oct. 29,2009	Jan. 29, 2010
Preliminary Estimate	May. 29, 2009	Aug. 27, 2009	Nov. 24, 2009	Feb. 26, 2010
Final Estimate	Jun. 25, 2009	Sep. 30, 2009	Dec. 22, 2009	Mar. 26, 2010

Source: U.S. Bureau of Economic Analysis.

DOB always incorporates the most recent NIPA data when doing a forecast. For example, the forecast completed in the middle of October, in preparation for the Mid-Year Financial Plan Update, included the final estimate of the second quarter that became available at the end of September. However, by mid-October, a substantial volume of high frequency data related to the third quarter also became available. DOB's current quarter methodology is designed to incorporate the full breadth of the available high frequency data to forecast the advance release of the quarter either in progress or just ended. These data include monthly payroll employment, retail trade, construction value-put-in-place, weekly initial unemployment insurance claims, monthly personal income and consumption estimates, monthly vehicle sales, manufacturing and trade shipments and inventories, monthly exports and imports, various price measures, daily interest rates, oil prices, exchange rates, and so on.

The first step in DOB's current quarter estimation process pertains to those variables which either are policy driven or whose inherent volatility makes them more suitable to the application of anecdotal evidence and judgmental trending than to formal modeling. Monthly estimates for these variables, which include the federal funds rate, the S&P 500, energy prices, the trade-weighted value of the dollar, Boeing aircraft deliveries, some employment series, and vehicle sales, are constructed to complete the quarter, making them available for the next step in the process.

A system of monthly models that forecast the primary inputs to BEA's quarterly estimates of the components of GDP and personal income comprises the second step.[9] For example, monthly industrial production is an input to private fixed investment in equipment and software, exports, and the change in private inventories. The model specification for monthly industrial production is presented in Table 8. In forecasting the quarterly GDP deflator and the deflators for many of the GDP components, DOB follows BEA by utilizing monthly CPI and PPI data, as well as monthly price indices for imports and exports. Forecasts for employment and interest rates are also inputs to models for several of the components of personal income. In turn, forecasts for personal income, mortgage interest rates, housing starts, and home sales are inputs to fixed residential investment. Additional step 2 models include retail sales, construction value-put-in-place, manufacturing orders and shipments, imports and exports, and Federal budgetary outlays.

TABLE 8
INDUSTRIAL PRODUCTION

$$\Delta \ln IP_t = \underset{(0.0003)}{-0.0008} + \underset{(0.039)}{0.090}\,\Delta \ln IP_{t-3} + \underset{(0.0004)}{0.002}\,\Delta RFED_t + \underset{(0.0001)}{0.0005}\,(TRATE10_t - RFED_t) + \underset{(0.121)}{1.99}\,\Delta \ln ETP_t$$
$$+ \underset{(0.123)}{0.488}\,\Delta \ln ETP_{t-1} - \underset{(0.122)}{0.444}\,\Delta \ln ETP_{t-2} - \underset{(0.137)}{0.551}\,\Delta \ln ETP_{t-3} - \underset{(0.004)}{0.014}\,HURR_t + \underset{(0.003)}{0.010}\,STRIKE_t - \underset{(0.004)}{0.028}\,BOEING_t$$

$Adjusted\ R^2 = 0.57$

$Number\ of\ Obs = 449$

Note: Values in parentheses under coefficients represent standard errors.

IP_t	Industrial Production
RFED	Effective federal funds rate
TRATE10	10-Year Treasury rate
ETP	Private employment
HURR	Dummy variable for Hurricanes Rita and Wilma
STRIKE	Dummy variable for end of GM strike
BOEING	Dummy variable for Boeing strike

Finally, in the third step, the real and nominal components of GDP are projected. In addition to the GDP price deflator, DOB has developed forecasting models for the following nominal and real GDP components: durable and nondurable consumption; housing-related and non-housing services consumption; new housing and other fixed

[9] For a summary description of BEA's estimation methods and source data for the advance GDP release, see <http://www.bea.gov/scb/pdf/2007/11%20November/1107_nipamethod.pdf>, last referenced October 28, 2008.

residential investment; business sector fixed investment in computer and computer-related durable equipment and software, noncomputer equipment, and structures; federal government defense consumption and investment, and nondefense consumption and investment spending; state and local government consumption and investment spending; oil and non-oil imports; and exports. Real U.S. GDP is calculated two ways: first, by dividing the sum of the nominal components by the GDP price deflator, and second, by "Fisher adding" the real components. If the two methods produce different outcomes, adjustments are made before incorporating the results into DOB/U.S.

Current quarter models have also been developed for the following components of national personal income: wages and salary disbursements, transfer payments to persons, personal contributions for social insurance, other labor income, rental income of persons with the capital consumption adjustment (CCA), personal dividend income, personal interest income, and proprietors' income with the inventory valuation adjustment (IVA) and CCA. Examples of models for the GDP deflator, real nondurable consumption, and two components of personal income appear below.

GDP Deflator

As alluded to above, the current quarter GDP deflator is a function of the monthly CPI and the price deflators for imports and exports. The left-hand side variable is quarterly growth at seasonally adjusted annualized rates (SAAR). The right-hand side concepts are also annualized quarterly growth rates as shown in Table 9.

TABLE 9
GDP DEFLATOR

$$GGDF_t = \underset{(0.0006)}{0.003} + \underset{(0.053)}{0.491}\left[\left(\frac{\sum_{i=1}^{3} CPI_{t,i}}{\sum_{i=1}^{3} CPI_{t-1,i}}\right)^4 - 1\right] - \underset{(0.011)}{0.063}\left[\left(\frac{\sum_{i=1}^{3} PIB_{t,i}}{\sum_{i=1}^{3} PIB_{t-1,i}}\right)^4 - 1\right] + \underset{(0.026)}{0.037}\left[\left(\frac{\sum_{i=1}^{3} PEB_{t,i}}{\sum_{i=1}^{3} PEB_{t-1,i}}\right)^4 - 1\right]$$

$$+ \underset{(0.10)}{0.415} AR1 + \underset{(0.0006)}{0.003}\ AR4$$

Adjusted $R^2 = 0.68$

Number of Obs $= 82$

Note: Values in parentheses under coefficients represent standard errors.

GGDF	Annualized quarterly growth rate of GDP deflator
$CPI_{t,i}$	CPI for *i*th month of quarter *t*
$PIB_{t,i}$	Imports price deflator for *i*th month of quarter *t*
$PEB_{t,}$	Exports price deflator for *i*th month of quarter *t*
AR1	Autocorrelation correction term
AR4	Autocorrelation correction term

Table 10 shows how a recent set of estimates evolved over the quarter and compares them to BEA's advance release. The three vantages that appear in the this table and those that follow refer to various points in time during the forecast period, with vantage 1 typically referring to a point in the second month of the current quarter, vantage 2 a point in the third month, and vantage 3 a point in the first month of the following quarter.

TABLE 10
CURRENT QUARTER ESTIMATES: GDP DEFLATOR
Percent Change (SAAR)

		Vantage 1	Vantage 2	Vantage 3	Advance
2005	Q1	1.7	2.0	3.1	3.2
	Q2	3.1	2.8	2.5	2.5
	Q3	1.9	2.0	2.6	3.1
	Q4	4.0	3.6	2.6	3.0
2006	Q1	2.7	2.0	2.0	3.3
	Q2	3.4	3.3	3.4	3.3
	Q3	2.5	2.9	3.0	1.8
	Q4	-0.1	1.6	0.3	1.5
2007	Q1	2.5	3.0	3.9	4.0
	Q2	2.8	3.4	3.6	2.7
	Q3	1.7	1.5	1.3	0.7
	Q4	2.6	2.3	2.8	2.5
2008	Q1	3.7	3.5	3.5	2.6
	Q2	1.5	1.6	1.3	1.1
	Q3	3.5	4.9	4.0	4.1
	Q4	2.2	0.7	-1.0	-0.3
2009	Q1	1.4	1.7	1.5	2.8
	Q2	1.4	1.2	1.0	0.2
	Q3	2.1	2.0	2.0	0.2
	Q4	1.5	1.5	1.3	0.6
2010	Q1	1.6	0.8	0.8	0.9
	Q2	0.3	0.3	0.3	1.8

Source: Moody's Economy.com; DOB staff estimates.

Nondurable Consumption

NIPA data for consumption and personal income are available both monthly and quarterly. Based on BEA's methodology, the forecasting model for nondurable consumption includes nondurable retail sales, which is projected simultaneously and incorporates equity market performance, as measured by the S&P 500, the nondurable component of the CPI, and personal income. The implicit price deflator for nondurable consumption is estimated within the same system, with the nondurable component of the CPI and the spot price of West Intermediate Texas crude oil on the right-hand side. The estimation results appear in Table 11. Real nondurable consumption is computed by dividing its nominal value by the implicit price deflator. Table 12 shows how a recent set of estimates evolved over the quarter and compares them to BEA's advance release.

TABLE 11
NONDURABLE CONSUMPTION

Nondurable Consumption

$$\Delta \ln CN_t = \underset{(0.0005)}{-0.0012} + \underset{(0.051)}{1.176}\, \Delta \ln RTNF_t + \underset{(0.050)}{0.140}\, \Delta \ln RTNF_{t-1}$$

Adjusted $R^2 = 0.76$

Nondurable Retail Sales

$$\Delta \ln RTNF_t = \underset{(0.0004)}{0.002} + \underset{(0.009)}{0.039}\, \Delta \ln SP500_t + \underset{(0.039)}{0.560}\, \Delta \ln CPIUAN_{t-1} + \underset{(0.094)}{0.207}\, \Delta \ln YP_t - \underset{(0.075)}{0.458}\, AR1_t - \underset{(0.075)}{0.165}\, AR2_t$$

Adjusted $R^2 = 0.54$

Implicit Price Deflator for CN

$$\Delta \ln PICN_t = \underset{(0.023)}{0.856}\, \Delta \ln CPIUAN_t + \underset{(0.002)}{0.006}\, \Delta \ln WTI_t$$

Adjusted $R^2 = 0.92$

Number of Obs=177

Note: Values in parentheses under coefficients represent standard errors.

CN_t	Nondurable consumption;
$RTNF_t$	Nondurable retail sales;
YP_t	Personal income
$SP500_t$	Standard and Poor's 500 index
$CPIUAN_t$	Nondurable goods CPI
$AR1_t$	Autocorrelation correction term
$AR2_t$	Autocorrelation correction term
$PICN_t$	Implicit price deflator for nondurable consumption
WTI_t	West Texas intermediate crude oil price

TABLE 12
CURRENT QUARTER ESTIMATES: REAL NONDURABLE CONSUMPTION
Percent Change (SAAR)

		Vantage 1	Vantage 2	Vantage 3	Advance
2005	Q1	5.5	7.1	5.4	4.9
	Q2	1.3	1.5	1.7	3.3
	Q3	3.5	4.2	1.6	2.6
	Q4	3.8	4.6	5.8	5.1
2006	Q1	6.5	5.8	6.0	5.4
	Q2	1.5	1.3	(0.1)	1.7
	Q3	2.1	3.4	3.0	1.6
	Q4	2.8	4.3	5.6	6.9
2007	Q1	2.9	4.9	3.4	2.9
	Q2	1.2	2.0	(0.3)	(0.8)
	Q3	1.8	3.1	3.7	2.7
	Q4	1.9	1.3	1.8	1.9
2008	Q1	0.5	(1.2)	(1.5)	(1.3)
	Q2	1.6	0.9	5.2	4.0
	Q3	1.0	(2.3)	(4.8)	(6.4)
	Q4	(6.6)	(5.3)	(4.6)	(7.1)
2009	Q1	(1.2)	(1.9)	(0.1)	1.3
	Q2	(0.6)	(5.4)	(3.9)	(2.5)
	Q3	8.4	9.9	12.7	1.1
	Q4	8.5	11.4	10.2	10.5
2010	Q1	4.3	9.2	9.9	8.7
	Q2	(3.6)	(2.9)	(2.7)	(3.0)

Source: Moody's Economy.com; DOB staff estimates.

Personal Income

Data for personal income and its components are available at monthly frequency. Since wages account for such a large part of personal income, employment-related data are critical inputs to the personal income models, as are initial claims for unemployment insurance benefits, interest rates, and the S&P 500. These variables are projected in step two of the current quarter forecasting process. To avoid nonstationarity, all variables are transformed as the difference between the logarithm of the current month and the logarithm of the variable at the same month of the previous quarter (three months earlier).

Table 13 presents the model specification and estimation results for wage and salary disbursements. The wage and salary disbursement model contains total private employment for those employed in the private sector as the main driving forces. The model also includes dummy variables to account for income shifting that occurred in anticipation of tax law changes that cannot be captured by the employment and earnings data alone. Table 14 shows how a recent set of estimates evolved over the quarter and compares them to BEA's advance release.

TABLE 13
WAGE AND SALARY DISBURSEMENTS

$$\Delta_3 \ln WS_t = \underset{(0.004)}{0.011} + \underset{(0.068)}{0.957}\Delta_3 \ln ETP_t + \underset{(0.004)}{0.051}D92M12_t - \underset{(0.005)}{0.030}D93M1_t$$
$$- \underset{(0.005)}{0.032}D93M2_t - \underset{(0.004)}{0.090}D93M3_t + \underset{(0.004)}{0.054}D93M12_t - \underset{(0.005)}{0.012}D94M1_t$$
$$- \underset{(0.005)}{0.012}D94M2_t - \underset{(0.004)}{0.061}D94M3_t + \underset{(0.007)}{0.994}AR1_t$$

Adjusted $R^2 = .90$

Number of Obs $= 521$

Note: Values in parentheses under coefficients represent standard errors.

Δ_3	Change from three months ago
WS_t	Wage and salary disbursements
ETP_t	Employment, total private
$DyrMm_t$	Dummy=1 for year=yr and month=m, 0 otherwise
$AR1_t$	Autocorrelation correction term

TABLE 14
CURRENT QUARTER ESTIMATES:
WAGE AND SALARY DISBURSEMENTS
PERCENT CHANGE (SAAR)

		Vantage 1	Vantage 2	Vantage 3	Advance
2005	Q1	5.3	4.7	5.4	5.4
	Q2	6.5	5.4	5.4	5.0
	Q3	3.9	4.5	4.8	4.7
	Q4	3.6	4.9	4.2	4.2
2006	Q1	5.3	6.3	6.0	6.0
	Q2	7.3	6.1	6.1	6.4
	Q3	5.7	5.2	5.2	4.9
	Q4	5.9	5.8	5.8	6.0
2007	Q1	8.0	9.1	9.0	9.5
	Q2	5.5	2.5	2.5	2.8
	Q3	6.1	6.3	5.1	5.2
	Q4	4.6	5.1	5.0	4.4
2008	Q1	4.8	4.4	4.5	5.3
	Q2	4.6	2.8	2.7	3.3
	Q3	3.4	3.9	3.9	3.4
	Q4	1.6	0.7	0.1	(1.0)
2009	Q1	(2.5)	(3.7)	(3.7)	(4.4)
	Q2	(2.7)	(1.7)	(2.1)	(5.0)
	Q3	(1.0)	(0.2)	0.2	(0.3)
	Q4	(6.1)	1.0	1.8	2.2
2010	Q1	3.6	3.1	2.6	3.2
	Q2	4.0	3.9	4.7	3.4

Source: Moody's Economy.com; DOB staff estimates.

The driving forces for proprietors' income are total private employment, the 10-year Treasury bond rate, and the variable's own past. Table 15 presents the model specification and estimation results for this income component, while Table 16 presents a history of the model's accuracy.

TABLE 15
PROPRIETORS' INCOME

$$\underset{}{\Delta_3 \ln PRP_t} = \underset{(0.001)}{0.007} + \underset{(0.046)}{0.241}\,\Delta_3 \ln PRP_{t-1} + \underset{(0.212)}{1.169}\,\Delta_3 \ln ETP_t - \underset{(0.014)}{0.030}\,\Delta_3 \ln TRATE10_t + \underset{(0.016)}{0.956}\,AR1_t$$

$Adjusted\ R^2 = .78$

$Number\ of\ Obs = 521$

Note: Values in parentheses under coefficients represent standard errors.

Δ_3	Change from three months ago
PRP_t	Proprietors' income
ETP_t	Employment, total private
$TRATE10_t$	Interest rate on 10-year treasury notes; in month t
$AR1_t$	Autocorrelation correction term

TABLE 16
CURRENT QUARTER ESTIMATES: PROPRIETORS' INCOME
PERCENT CHANGE (SAAR)

		Vantage 1	Vantage 2	Vantage 3	Advance
2005	Q1	18.3	11.3	12.0	12.0
	Q2	9.9	9.1	9.3	11.1
	Q3	(2.7)	1.7	1.9	0.4
	Q4	1.8	12.7	16.0	13.4
2006	Q1	5.9	5.4	5.3	4.3
	Q2	1.5	2.4	3.8	3.6
	Q3	(0.3)	(1.2)	(1.2)	0.6
	Q4	2.7	4.3	4.4	3.7
2007	Q1	2.3	3.1	3.7	4.8
	Q2	6.6	3.2	3.1	3.0
	Q3	1.8	1.3	4.3	2.8
	Q4	(0.6)	1.1	1.1	3.3
2008	Q1	7.5	5.1	1.4	0.3
	Q2	(3.2)	1.3	1.3	2.1
	Q3	6.0	2.0	2.0	1.2
	Q4	(2.7)	(2.3)	(5.2)	(7.2)
2009	Q1	(8.1)	(6.8)	(6.8)	(7.3)
	Q2	(4.9)	(0.9)	(1.7)	(5.4)
	Q3	(3.6)	5.8	6.1	4.1
	Q4	2.5	7.7	10.4	11.1
2010	Q1	6.6	4.3	(0.5)	1.7
	Q2	6.0	10.4	8.2	7.5

Source: Moody's Economy.com; DOB staff estimates.

Nonfarm Payroll Employment

National employment trends impact many other economic indicators. Early each month, BLS releases its Employment Situation Report which summarizes national nonfarm payroll employment trends for the prior month. DOB has constructed models to predict the initial monthly release, which include average weekly initial unemployment insurance claims and average weekly continuing unemployment insurance claims as predictor variables. Unemployment insurance claims are a useful measure of layoff activity in the job market, while continuing claims measure the accumulation of individuals no longer in the workforce and thus may be an indicator of the rate of job creation. Thus, increases in initial and continuing claims should indicate weaker employment growth, while decreases will suggest an improving labor market.

National nonfarm payroll employment is estimated at several levels of aggregation including total, private, private services, total government and state and local government. The total and private employment models are specified with the endogenous variable expressed in first differences. Both models include the current and prior month's average initial claims and the first difference of monthly average continuing claims. Additional predictors for these models include the change in the number of workers striking during the month, the lag of the yield curve, and a dummy capturing the employment impact of the nation's preparation for and subsequent invasion of Iraq. Each model has three lags of the endogenous variable, which capture the persistence of the series. The specification and estimation results from the total employment model are presented in Table 17.

Private sector service employment is modeled, in first differences, as an autoregressive process. The first differences of private sector employment and the number of striking service sector workers are used as explanatory variables.

The first difference of government employment is modeled using initial claims and the first difference of continuing claims as explanatory variables. Dummy variables are included to capture the temporary increase in federal employment necessary to complete the decennial census. The first, third, fourth and fifth lags of the left hand side variable are also included. The monthly change in state and local government employment is modeled using the first difference of government employment and the change in the number of government workers on strike as the independent variables.

TABLE 17
MONTHLY NONFARM EMPLOYMENT ESTIMATE

$$\Delta TOTEMP_t = \underset{(40.06)}{165.717} - \underset{(0.0003)}{0.002}\ IC_t + \underset{(0.0003)}{0.0018}\ IC_{t-1} - \underset{(0.00007)}{0.0004}\ \Delta CC_t - \underset{(0.00006)}{0.0002}\ IRAQ_t + \underset{(3.07)}{6.62}\ YC_{t-1}$$

$$- \underset{(0.0001)}{0.001}\ \Delta STRIKE_t - \underset{(27.69)}{95.50}\ UILC_t + \underset{(0.04)}{0.25}\ \Delta TOTEMP_{t-1} + \underset{(0.04)}{0.24}\ \Delta TOTEMP_{t-2} + \underset{(0.04)}{0.15}\ \Delta TOTEMP_{t-3}$$

Adjusted $R^2 = .77$

Number of Obs = 457

Note: Values in parentheses under coefficients represent standard errors.

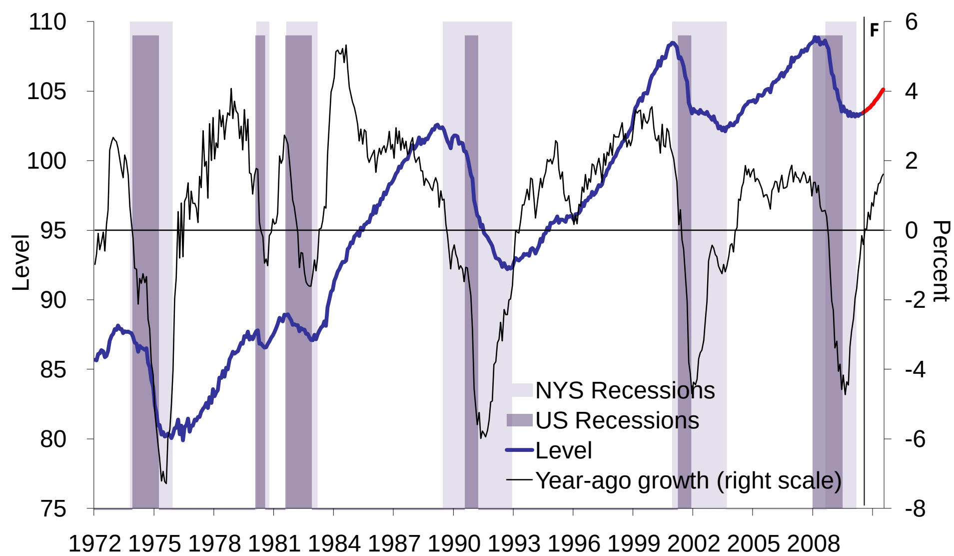
TOTEMP	Nonfarm Employment
IC	Monthly average initial claims
CC	Monthly average continuing claims
IRAQ	Iraq war dummy. Defined as 1 from May 2002 until Feb. 2004. Otherwise 0.
YC	Yield curve
STRIKE	Employees on strike
UILC	Unemployment insurance extension. Defined as 1 after June 2008. Otherwise 0

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 overall 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 rate of State economic growth can vary substantially from that of the nation. Figure 16 compares the lengths of the national recessions, as defined by the National Bureau of Economic Research (NBER) Business Cycle Dating Committee, with those of the State, as determined by the DOB methodology for constructing the New York State Index of Coincident Economic Indicators.[1] The comparison demonstrates by how much the two can differ in both length and severity. For example, during the early 1990s, the State was in recession noticeably earlier than the nation and came out of recession significantly later (see Figure 16).

Figure 16

New York State Index of Coincident Economic Indicators



Note: NYS recession dates are DOB staff estimates; forecast (in red) is derived from the New York State Leading Index.
Source: Moody's Economy.com; 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

[1] For a detailed description see R. Megna, and Q. Xu (2003), "Forecasting the New York State Economy: The Coincident and Leading Indicators Approach," *International Journal of Forecasting*, Vol 19, pp 701-713.

specifications, while the State's unique dynamics are modeled within a restricted VAR (RVAR) framework.[2]

MODEL STRUCTURE

DOB/N.Y. has six major modules: nonfarm payroll employment, real nonbonus average wage, bonus payments, nonwage income, prices, and unemployment rate. Because the state-level wage data published by BEA have proven unsatisfactory for the purpose of forecasting State personal income tax liability, the Budget Division constructs its own wage and personal income series based on Covered Employment and Wage data, also known as the ES 202 data. Moreover, because of the importance of trends in variable income – composed of bonus and stock options income – to the understanding of trends in State wages overall, the Budget Division has developed a methodology described below for decomposing its wage series into bonus and nonbonus wages.

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 18 presents the final specification for manufacturing employment.

[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.

TABLE 18
MANUFACTURING EMPLOYMENT

$$\Delta \ln E39_t = \underset{(0.00111)}{-0.00367} + \underset{(0.00680)}{0.00782} \Delta \ln E23_{t-2} + \underset{(0.0354)}{0.787} \Delta \ln EUS39_t - \underset{(0.00208)}{0.0150} DQ1_t + \underset{(0.00187)}{0.00846} DQ2_t$$

Adjusted $R^2 = 0.940$

Number of Obs $= 132$

Note: Values in parentheses under coefficients represent standard errors.

E39	Manufacturing employment
E23	Construction 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. Bonuses have grown substantially since the early 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 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.

Because no government agency collects data on variable income distinct from ordinary wages, 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

[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.

total number of firm employees. It is assumed that only private sector employees, excluding those of private educational institutions, 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 two indicators of Wall Street underwriting activities – the dollar volume of initial public offerings (IPOs) and the value of debt underwritings – can explain most of the variation in financial and insurance sector bonuses. Forecasts for these variables are based on interest rate and equity market forecasts provided by DOB/U.S. The finance and insurance sector bonus model is then constructed by using these underwriting activities as explanatory variables. The finance and insurance sector bonus equation appears in Table 19.

TABLE 19
FINANCE AND INSURANCE SECTOR BONUSES

$$\ln B52_t = \underset{(0.280)}{-\,1.71} + \underset{(0.0552)}{0.179}\,\ln IPO_{t-4} + \underset{(0.173)}{0.267}\,\Delta_4 \ln DEBT_t + \underset{(0.00314)}{0.0228}\,T + \underset{(0.132)}{1.35}\,DQ1_t$$

Adjusted $R^2 = 0.80$

Number of Obs $= 132$

Note: Values in parentheses under coefficients represent standard errors.

B52	Finance and insurance sector bonus
IPO	Value of initial public offering
DEBT	Value of debt underwriting
T	Time trend
DQ1	Seasonal dummy for quarter 1

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 20 gives an example of the specification for bonuses in manufacturing.

TABLE 20
MANUFACTURING BONUSES

$$\Delta B39_t = \underset{(0.116)}{0.457} - \underset{(0.122)}{0.423}\,\Delta B39_{t-1} - \underset{(0.123)}{0.427}\,\Delta B39_{t-2} - \underset{(0.117)}{0.311}\,\Delta B39_{t-3} + \underset{(0.0949)}{0.290}\,\Delta B39_{t-4} + \underset{(0.00532)}{0.0321}\,\Delta B52_t$$
$$- \underset{(0.00534)}{0.0219}\,\Delta B52_{t-4} - \underset{(0.193)}{0.435}\,DQ1_t - \underset{(0.174)}{0.522}\,DQ2_t - \underset{(0.174)}{0.789}\,DQ3_t - \underset{(0.109)}{0.324}$$
$$\left(B39_{t-1} - \underset{(0.0860)}{1.232} - \underset{(0.00492)}{0.0367}\,B52_{t-1} \right)$$

Adjusted $R^2 = 0.93$

Number of Obs $= 132$

Note: Values in parentheses under coefficients represent standard errors.

B39	Manufacturing bonuses
B52	Finance and insurance bonuses
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 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 21 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 21
FINANCE AND INSURANCE SECTOR REAL NONBONUS AVERAGE WAGE

$$\Delta RWA52_t = -\underset{(0.986)}{0.371}\,\Delta RWA52_{t-1} - \underset{(0.101)}{0.467}\,\Delta RWA52_{t-2} - \underset{(0.102)}{0.227}\,\Delta RWA52_{t-3} + \underset{(0.0987)}{0.274}\,\Delta RWA52_{t-4} + \underset{(0.00127)}{0.00272}\,\Delta USRA_{t-1}$$

$$\underset{(0.00133)}{0.000250}\,\Delta USRA_{t-2} + \underset{(0.00131)}{0.00300}\,\Delta USRA_{t-3} - \underset{(0.00135)}{0.000470}\,\Delta USRA_{t-4} + \underset{(0.470)}{1.59}\,DQ1_t + \underset{(0.469)}{0.455}\,DQ2_t + \underset{(0.462)}{0.705}\,DQ3_t$$

$$+\underset{(17.7)}{20.1}\,\Delta lnGDP_{t-1} - \underset{(0.0227)}{0.0112}\,RTRATE3_t - \underset{(0.00000705)}{0.0000130}\,(RWA52_{t-1} - 29.790 - 3.287\,USRA_{t-1})$$

Adjusted $R^2 = 0.57$

Number of Obs $= 132$

Note: Values in parentheses under coefficients represent standard errors.

RWA52	Real average wage for New York finance and insurance sector
USRA	U.S. real average wage
GDP	Real U.S. gross domestic product
RTRATE3	Real interest rate on 3-month Treasury notes
DQ*i*	Seasonal dummy variable for quarter i

Nonwage Income

DOB/N.Y. estimates six components of nonwage income: transfer income; property income, which includes dividend, interest, and rental income; proprietors' income; other labor income; personal contributions to social insurance programs; and the residence adjustment, which corrects for the fact that wages are measured according to place of employment rather than place of residence. The two largest components, transfer payments and property income, together account for almost 80 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 22 gives an example of the specification for property 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 transfer income equation includes New York's population share; while 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 22
PROPERTY INCOME

$$\Delta \ln PROP_t = \underset{(0.00120)}{0.00167} + \underset{(0.0446)}{0.621}\,\Delta \ln P_t + \underset{(0.0694)}{0.234}\,\Delta \ln P_{t-1} - \underset{(0.0682)}{0.308}\,\Delta \ln P_{t-2} + \underset{(0.0992)}{0.0134}\,\Delta \ln PROP_{t-1} + \underset{(0.0882)}{0.350}\,\Delta \ln PROP_{t-2}$$

Adjusted $R^2 = 0.78$

Number of Obs $= 132$

Note: Values in parentheses under coefficients represent standard errors.

PROP	New York State property income
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 23, is specified as a function of the current and lagged value of the U.S. CPI, as well as its own lag.

TABLE 23
COMPOSITE CPI FOR NEW YORK

$$\Delta \ln CPINY_t = \underset{(0.00037)}{0.00100} + \underset{(0.085)}{0.3240} * \Delta \ln CPINY_{t-4} + \underset{(0.034)}{0.950}\,\Delta \ln CPI_t - \underset{(0.081)}{0.336}\,\Delta \ln CPI_{t-4} - \underset{(0.00020)}{0.00088}(RUNY - RUUS)_{t-3} - \underset{(0.002)}{0.009}\,D1982Q4_t$$

Adjusted $R^2 = 0.92$

Number of Obs $= 132$

Note: Values in parentheses under coefficients represent standard errors.

CPINY	New York consumer price index
CPI	National consumer price index
RUNY	New York unemployment rate
RUUS	U.S. unemployment rate
D1982Q4	Dummy for 1982Q4

New York State Unemployment Rate

The New York unemployment rate equation, shown in Table 24, is specified as a simple autoregressive process with the national unemployment rate (current and lagged) as an explanatory variable.

TABLE 24
NEW YORK UNEMPLOYMENT RATE

$$RUNY_t = \underset{(0.0222)}{0.942}\ RUNY_{t-1} + \underset{(0.0738)}{0.713}\ RUUS_t - \underset{(0.0769)}{0.670}\ RUUS_{t-1} + \underset{(0.0609)}{0.851}\ DQ1_t - \underset{(0.0624)}{0.644}\ DQ2_t + \underset{(0.0609)}{0.183}\ DQ3_t$$

Adjusted $R^2 = 0.98$

Number of Obs $= 132$

Note: Values in parentheses under coefficients represent standard errors.

RUNY	New York unemployment rate
RUUS	U.S. unemployment rate
DQi	Seasonal dummy for quarter i

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 NYSAGI components data series are 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. All estimation results presented below are based on tax return data from a sample of State taxpayers through the 2008 tax year, made available by the New York State Department of Taxation and Finance.

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. Since most taxable income is earned as wages and salaries and thus related to employment, total State payroll employment, which is forecast within DOB/N.Y., is a key input to this model.

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 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 included to account for unusual growth in tax returns generated by the stock market. The equation specification is shown in Table 25.

TABLE 25
TAX RETURNS

$$\Delta \ln RET_t = \underset{(0.002)}{0.003} + \underset{(0.126)}{0.382} \Delta \ln NYSEMP_t + \underset{(0.042)}{0.129} \Delta \ln((PROPNY + YENTNY)/CPINY)_t$$
$$+ \underset{(0.008)}{0.018} D87_t + \underset{(0.008)}{0.039} D00_t$$

Adjusted $R^2 = 0.74$

Number of Obs $= 31$

Note: Values in parentheses under coefficients represent standard errors.

RET	Number of tax returns
NYSEMP	Total State employment
PROPNY	State property income
YENTNY	State proprietors' income
CPINY	Consumer Price Index for New York
D87	Dummy variable for 1987 tax law change
D00	Dummy variable for 2000 equity market bubble

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, equity market activity, and real estate 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 Ozanne (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 or steady-state response variable is the actual tax rate.

The growth in realizations is also expected to be directly related to growth in equity prices. To capture the effect of equity prices, the average price of all stocks traded is incorporated into the model. Forecasts of the average stock price are based on the forecast for the S&P 500 from DOB/U.S. The impact of changes in the S&P 500 level on the average price of stocks traded is allowed to be different for declines and increases in S&P 500.

The model also contains a measure of real estate market activity, which appears to have substantially grown as a contributor to contributor to capital gains realizations since 2000. Taxpayers can exempt gains from the sale of a primary residence of up to $250,000 ($500,000 if filing jointly), but all other capital gains from real estate transactions are fully taxable. Conditions in the real estate market are captured by including New York State real estate transfer tax collections. The model specification is shown in Table 26.

TABLE 26
POSITIVE CAPITAL GAINS REALIZATIONS

$$\Delta \ln CG_t = \underset{(8.67)}{-30.26}\,\Delta TRSTX_t - \underset{(0.992)}{4.51}\,\Delta PRMTX_t + \underset{(0.191)}{1.49}\,\Delta \ln EQTYP_t + \underset{(0.127)}{0.660}\,\Delta \ln RETT_t + \underset{(0.109)}{0.503}\,D96\_97_t$$

Adjusted $R^2 = 0.84$

Number of Obs $= 35$

Note: Values in parentheses under coefficients represent standard errors.

CG	Positive capital gains realizations
TRSTX	Transitory tax measure
PRMTX	Permanent tax rate
EQTYP	Average price of stocks traded
RETT	Real estate transfer tax collections
D96_97	Dummy variable: 1 for 1996, -1 for 1997, 0 otherwise

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 to this income category is income from closely-held corporations organized under subchapter S of the Internal Revenue Code, and known as S corporations. 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] As more firms choose S corporation status over C corporation status, which is taxed under the corporate franchise tax, personal income increases, all else equal. 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, is likely to have 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 27.

[1] See, for example, Carroll and Joulfaian (1997).

TABLE 27
POSITIVE PARTNERSHIP, S CORPORATION,
RENT, ROYALTY, ESTATE AND TRUST INCOME

$$\Delta \ln PSG_t = \underset{(0.016)}{0.028} + \underset{(0.090)}{0.423}\Delta MTR_t + \underset{(0.068)}{0.205}\Delta \ln JS_t + \underset{(0.497)}{1.82}\,\Delta \ln GDP_t + \underset{(.032)}{0.224} D88\_89_t$$

$Adjusted\ R^2 = 0.75$

$Number\ of\ Obs = 31$

Note: Values in parentheses under coefficients represent standard errors.

PSG	Partnership, S corporation, rent, royalty, estate and trust income
MTR	Difference between corporate and personal income maximum marginal tax rates
JS	Standard and Poor's 500 stock index
GDP	Real U.S. GDP
D88_89	Dummy variable, 1 for 1988, -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 of real U.S. GDP. In the polynomial lag estimation, the coefficients on the various lags of GDP are estimated as functions of the length of the lag. As specified in the model shown in Table 28, the coefficient on the i^{th} lag of GDP is equal to - 0.734 i + 0.405 i^2. Thus, the coefficient on the second lag (i=2) of GDP is 0.153 = - 0. 734*2 + 0. 405*4.

Dividend income is also thought to be associated with firms' expectations pertaining to their future profitability, 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 yield. Dividends are also linked to equity market performance, as measured by the S&P 500, and dividend payouts by Standard and Poor member firms.

Historically, State dividend income has ranged from a decline of six percent in 1991 to an increase of 27 percent in 2004, 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. A dummy variable is also included to capture the extraordinary impact of recessions (1975, 1990, 1991, 1992, 2001, 2002, 2008, and 2009) beyond what is captured by fluctuations in real U.S. GDP. A third dummy variable accounts for the impact of a sizable one-time payout of dividends to shareholders by the Microsoft Corporation in 2004.

TABLE 28
DIVIDEND INCOME

$$\Delta \ln DIV_t = \underset{(0.222)}{0.473}\,\Delta JSDIV + \underset{(0.010)}{0.028}\,\Delta TRATE10_t + \underset{(0.097)}{0.158}\,\Delta \ln JS_t - \underset{(0.316)}{0.328}\,\Delta \ln GDP_{t-1} + \underset{(0.270)}{0.153}\,\Delta \ln GDP_{t-2}$$
$$\underset{(0.453)}{1.45}\,\Delta \ln GDP_{t-3} - \underset{(0.031)}{0.125}\,DREC_t + \underset{(0.060)}{0.128}\,DMCRSFT_t + \underset{(0.041)}{0.125}\,D88\_89_t + \underset{(0.057)}{0.114}\,D05_t$$

Adjusted $R^2 = 0.75$

Number of Obs $= 34$

Note: Values in parentheses under coefficients represent standard errors.

DIV	Dividend income
JSDIV	Standard and Poor's 500 Dividends
TRATE10	10-year Treasury yield
JS	Standard and Poor's 500 stock Index
GDP	Real U.S. GDP
DREC	Recession dummy variable
DMCRSFT	Microsoft one-time dividend payout dummy for 2004
D88_89	Dummy variable, 1 for 1988, -1 for 1989
D05	Dummy variable, 1 for 2005, 0 otherwise

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 U.S. federal funds interest rate. In addition, the overall trend in taxable interest income for New York is found to track New York property income, a component of State personal income that combines interest, dividend, and rental income. Further included is a dummy variable to capture the extraordinary impact of recessions (1975, 1990, 1991, 1992, 2001, 2002, 2008, and 2009) on interest income. The model specification is shown in Table 29.

TABLE 29
INTEREST INCOME

$$\Delta \ln INT_t = \underset{(0.010)}{0.029}\,\Delta FFRATE_t + \underset{(0.166)}{1.18}\,PROPNY_t - \underset{(0.039)}{0.107}\,DREC_t$$

Adjusted $R^2 = 0.77$

Number of Obs $= 33$

Note: Values in parentheses under coefficients represent standard errors.

INT	Interest income
FFRATE	Federal Funds interest rate
PROPNY	NYS property income
DREC	Recession 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. Business income is expected to vary with the overall strength 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 tax laws. The equation specification is shown in Table 30.

TABLE 30
BUSINESS INCOME

$$\Delta \ln BUS_t = \underset{(0.024)}{0.092} - \underset{(0.132)}{0.350} \Delta \ln BUS_{t-1} + \underset{(0.121)}{0.149} \Delta \ln YENTNY_t + \underset{(0.545)}{1.97} \Delta \ln GDP_t - \underset{(.020)}{0.097} D89_t$$

$Adjusted\ R^2 = 0.64$

$Number\ of\ Obs = 29$

Note: Values in parentheses under coefficients represent standard errors.

BUS	Sole proprietor and farm income
YENTNY	State proprietor income (NIPA definition)
GDP	Real U.S. GDP
D89	Dummy variable, 1 for years after 1988, 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 related 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 are 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. While the average annual growth rate between 1978 and 1989 was 13.4 percent, it fell to 6.5 percent between 1990 and 2008. This coincides with a decline in the 10-year Treasury yield from 10.3 percent in the earlier years to 5.7 percent in the later years. The equation specification is shown in Table 31.

TABLE 31
PENSION INCOME

$$\Delta \ln PEN_t = \underset{(0.002)}{0.014} \Delta TRATE10_{t-1} - \underset{(0.153)}{0.272} \Delta \ln PEN_{t-1} - \underset{(0.037)}{0.101} D92_t + \underset{(0.037)}{0.136} D94_t$$

$Adjusted\ R^2 = 0.649$

$Number\ of\ Obs = 29$

Note: Values in parentheses under coefficients represent standard errors.

PEN	Pension income
TRATE10	10-year Treasury yield
D92	Dummy variable for 1992
D94	Dummy variable for 1994

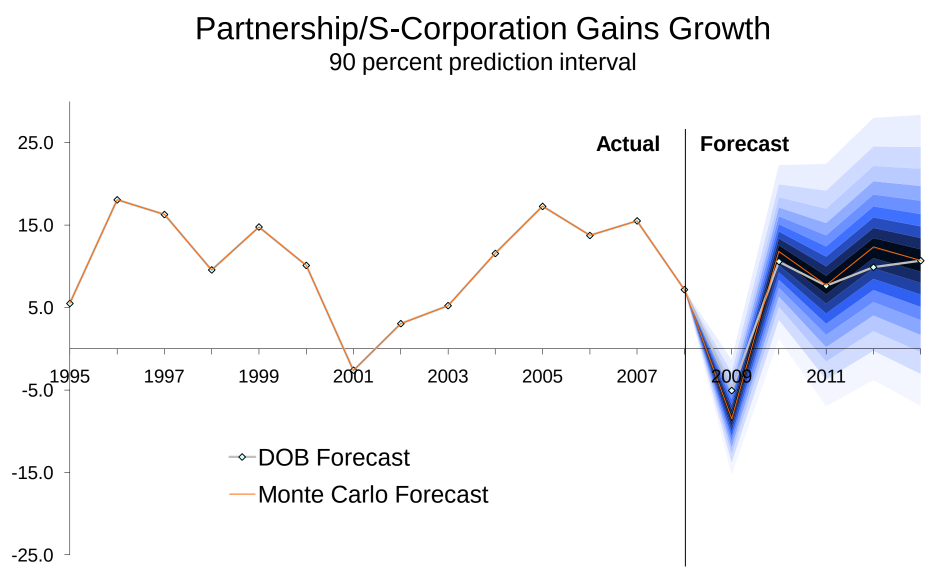
Risk Assessment and Fan Charts

Introduction

The Division of the Budget uses forecasting models to project future values for the components of New York State adjusted gross income (NYSAGI). By and large, these models presume that the historical relationships between the components of income and a number of key economic indicators are useful for projecting their future behavior, and that these relationships are stable and can be estimated using standard statistical methods. Since all statistical models are simplifications of complex relationships, they are subject to model misspecification error. In addition, there are risks associated with the forecasts for the exogenous economic indicators. Even if a model is well specified and the future values of the exogenous inputs can be predicted with certainty, a statistical forecast remains subject to error. There is always a component that cannot be captured by the model, which is simply ascribed to random variation. And the estimated parameters of the model are themselves random variables and, as such, subject to estimation error.

The tool used by the Division of the Budget for presenting the risk to the forecast is the fan chart. Fan charts display prediction intervals as shown in the sample chart below (see Figure 17). It is estimated that with 90 percent probability, future values will fall into the shaded area of the fan. Each band within the shaded area reflects five percent probability regions. The chart "fans out" over time to reflect the increasing uncertainty and growing risk as the forecast departs further from the base year. Not only does the fan chart graphically depict the risks associated with a point forecast as time progresses, but it also highlights how realizations that are quite far from the point estimate can have a reasonably high likelihood of occurring. Fan charts can exhibit skewness that reflects more downside or upside risk to the forecast, and the costs associated with erring on either side.

Figure 17



Note: With 90 percent probability, capital gains growth will fall within the shaded region. Bands represent 5 % probability regions.

Source: NYS Department of Taxation and Finance; DOB staff estimates.

Monte Carlo Simulation Study

The fan charts used by DOB are based on means and standard deviations derived from another tool, the Monte Carlo simulation study. For a given model specification and a given set of exogenous inputs, Monte Carlo simulation studies evaluate the risk to the forecast due to variation in the dependent variable that cannot be explained by the model, as well as the random variation in the model parameters. By assumption, the model errors are considered to be draws from a normally distributed random variable with mean zero. For purposes of the simulation, the model parameters are also considered to be random variables that are distributed as multivariate normal. The standard deviation of the regression errors, and the means and standard deviations of the parameter distribution are derived from the regression analysis.

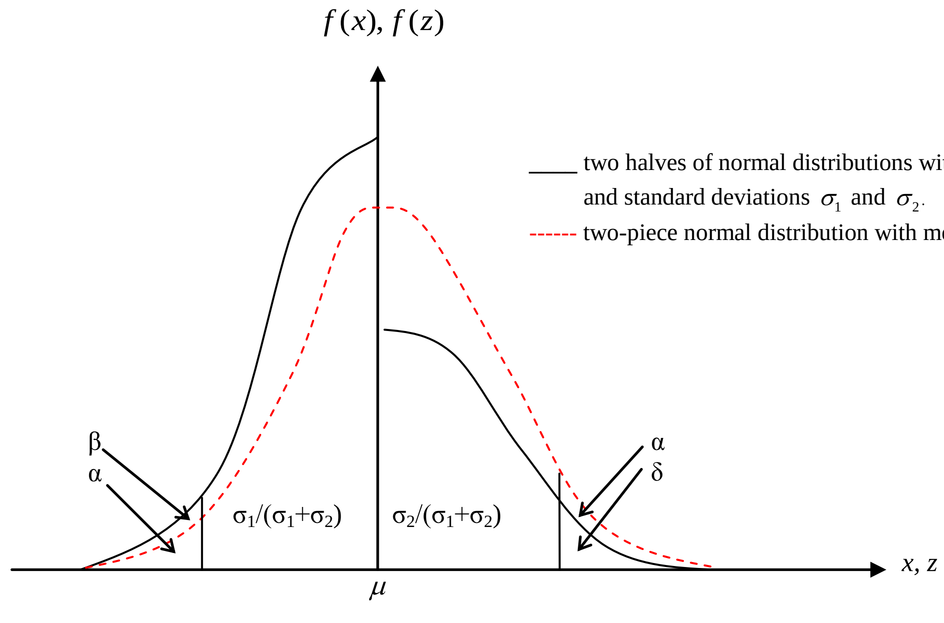
In order to simulate values for the dependent variable, a random number generator is used to generate a value for the model error and values for the parameters from each of the above probability distributions. Based on these draws and values from the input data set, which for purposes of the simulation is assumed to be fixed, the model is solved for the dependent variable. This "experiment" is typically repeated thousands of times, yielding thousands of simulated values for each observation of the dependent variable. The means and standard deviations of these simulated values provide the starting point for the fan chart.

The Fan Chart: Theoretical Underpinnings

To capture the notion of asymmetric risk, the fan chart used by DOB is based on a two-piece normal distribution for each of the forecast years following an approach due to Wallis (1999). A two-piece normal distribution of the form

$$f(x) = \begin{cases} A\exp[-(x-\mu)^2/2\sigma_1^2] & x \le \mu \\ A\exp[-(x-\mu)^2/2\sigma_2^2] & x \ge \mu \end{cases} \tag{1}$$

with $A = (\sqrt{2\pi}(\sigma_1+\sigma_2)/2)^{-1}$, is formed by combining halves of two normal distributions having the same mean but different standard deviations, with parameters (μ,σ_1) and (μ,σ_2), and scaling them to give the common value $f(\mu)$. If $\sigma_1 < \sigma_2$, the two-piece normal has positive skewness with the mean and median exceeding the mode. A smooth distribution $f(x)$ arises from scaling the discontinuous distribution $f(z)$ to the left of μ using $2\sigma_1/(\sigma_1+\sigma_2)$ and the original distribution $f(z)$ to the right of μ using $2\sigma_2/(\sigma_1+\sigma_2)$.



One can determine the cutoff values for the smooth probability density function $f(x)$ from the underlying standard normal cumulative distribution functions by recalling the scaling factors. For $\alpha < \sigma_1/(\sigma_1+\sigma_2)$, i.e. to the left of μ, the point of the two-piece normal distribution defined by $\text{Prob}(X \le x_\alpha) = \alpha$ is the same as the point that is defined by $\text{Prob}(Z \le z_\beta) = \beta$, with

$$\beta = \frac{\alpha(\sigma_1+\sigma_2)}{2\sigma_1} \qquad \text{and} \qquad x_\alpha = \sigma_1 z_\beta + \mu$$

Likewise, for $(1-\alpha) < \sigma_2/(\sigma_1+\sigma_2)$, i.e. to the right of μ, the point of the two-piece normal distribution that is defined by $\text{Prob}(X \le x_\alpha) = \alpha$ is the same as the point that is defined by $\text{Prob}(Z \le z_\delta) = \delta$, with

$$\delta = \frac{\alpha(\sigma_1+\sigma_2)}{2\sigma_2} \qquad \text{and} \qquad x_{1-\alpha} = \sigma_1 z_{1-\delta} + \mu$$

For the two-piece normal distribution, the mode remains at μ. The median of the distribution can be determined as the value defined by $\text{Prob}(X < x_\alpha) = 0.5$. The mean of the two-piece normal distribution depends on the skewness of the distribution and can be calculated as:

$$E(X) = \mu + \sqrt{\frac{2}{\pi}}(\sigma_2 - \sigma_1)$$

The Fan Chart: Choice of Parameters

In constructing its fan charts, DOB uses means from the Monte Carlo simulation study as the mean, μ, of the two underlying normal distributions. As mentioned above, if the two-piece normal distribution is skewed, the Monte Carlo mean becomes the mode or most likely outcome of the distribution and will differ from the median and the mean. In the sample fan chart above, the mode is displayed as the crossed line. Except for in extremely skewed cases the mode tends to fall close to the middle of the central 10 percent prediction interval. As Britton et al. (1998) point out in their discussion of the inflation fan chart by the Bank of England, the difference between the mean and the mode provides a measure of the skewness of the distribution. Given the skewness parameter, γ, DOB determines the two standard deviations, σ_1 and σ_2, as $\sigma_1 = (1+\gamma)\sigma$ and $\sigma_2 = (1\text{-}\gamma)\sigma$, where σ is the standard deviation from the Monte Carlo simulation study.

By definition, the mean of the distribution is the weighted average of the realizations of the variable under all possible scenarios, with the weights corresponding to the probability or likelihood of each scenario. In its forecasts, DOB aims to assess and incorporate the likely risks. Though no attempt is made to strictly calculate the probability weighted average, the forecast will be considered a close approximation of the mean. Thus the skewness parameter, γ, is determined as the difference between DOB's forecast and the Monte Carlo mean. DOB's fan chart shows central prediction intervals with equal tail probabilities. For example, the region in the darkest two slivers represents the ten percent region in the center of the distribution. DOB adds regions with 5 percent probability on either side of the central interval to obtain the next prediction interval. If the distribution is skewed, the corresponding 5 percent prediction intervals will include different ranges of growth rates at the top and the bottom, thus leading to an asymmetric fan chart.

The 5 percent prediction regions encompass increasingly wider ranges of growth rates as one moves away from the center because the probability density of the two-piece normal distribution decreases as one moves further the tails. Thus the limiting probability for any single outcome to occur is higher for the central prediction regions than for intervals further out because a smaller range of outcomes shares the same cumulative probability. Over time, risks become cumulative and uncertainties grow. DOB uses its own forecast history to determine the degree to which σ_1 and σ_2 need to be adjusted upward to maintain the appropriate probability regions.

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Part II

Revenue Methodologies

PERSONAL INCOME TAX

BACKGROUND

Historical

The New York State (NYS) personal income tax was originally enacted in 1919, six years after the ratification of the 16th Amendment to the U.S. Constitution allowed the Federal government to levy a personal income tax. A top rate of three percent was imposed on taxable incomes above $50,000 and remained in force until 1930. The present system of conformity with the Federal definition of adjusted gross income and allowing itemized deductions began in 1960. The tax rate schedule shifted several times during the 1970s, with the top rate peaking at 15.375 percent on taxable incomes above $25,000. Subsequently, the State underwent several major tax law reforms and reductions, culminating in a top tax rate of 6.85 percent and the implementation of numerous deductions and credits. In May 2003, two new top brackets were added temporarily for the 2003-2005 tax years with a maximum rate of 7.7 percent on taxable income above $500,000. The State's tax rate schedule returned to 2002 law effective in 2006. For tax years 2009 through 2011, the top tax rate has been temporarily increased to 8.97 percent on taxable income above $500,000.

The Nature of the Forecasting Problem

Detailed knowledge of the composition and distribution of taxable income is critical to accurately projecting future personal income tax (PIT) receipts. Consequently, the PIT forecasting process presents unique challenges. One complicating factor is the complex linkage between economic activity and PIT revenue. Individual taxpayer activities generate various forms of taxable income – such as wages, non-corporate business income, capital gains realizations, dividends, and interest income – that give rise to tax liability and, in turn, "cash" payments to the State. There can be long lags between the point in time when the liability is incurred and the cash payment is actually received by the New York State Department of Taxation and Finance. This lag is minimal for wages and salaries due to the withholding mechanism. However, for the non-wage components, such as capital gains realizations and business income, the lag can exceed one year.

A related challenge arises from the delay in the availability of liability data, of which the primary source is individual tax returns. The NYS Department of Taxation and Finance provides very timely information on the flow of PIT receipts throughout the tax year. Indeed, withholding data, which track wages and salaries closely, are compiled daily, while estimated payments are paid and compiled quarterly throughout the tax year. However, there is no detailed information on the income components that generated the underlying tax liability until tax returns are processed during the following year. The delay is compounded by the ability of taxpayers to request extensions for filing their returns, a common practice among high-income taxpayers. Thus, a solid estimate of 2009 tax liability will not become available until the end of 2010. This estimate will be further refined over the course of the first half of 2011 as Department of Taxation and Finance staff closely inspect and verify a sample of tax returns. The 2009 sample dataset, known as the personal income tax study file, is expected to become available during the summer of 2011.

Detailed information on both the components of taxable income and their distribution is also necessary for analyzing the impact of proposed tax law changes on PIT liability. Tax law changes that affect particular income components may have variable effects on taxpayers depending on their level of incomes. For example, a change in the tax treatment of capital gains would tend to affect high-income taxpayers more than low-income taxpayers, all things being equal. Therefore, it is essential to be able to project not only the total value of the components of taxable income, but also how those components are distributed across taxpayers by income.

Computing Personal Income Tax Liability

The computation of the personal income tax starts with the addition of the taxable components of income to arrive at Federal gross income.[1] The Internal Revenue Code permits certain exclusions and adjustments in arriving at Federal adjusted gross income (FAGI). The State requires certain additions and subtractions to FAGI in order to obtain New York State adjusted gross income (NYSAGI). NYSAGI is reduced by the larger of the State standard deduction or the total of itemized deductions. State itemized deductions generally conform to the Federal concept but with certain modifications, such as the add-back of State and local income taxes. Federal law, to which New York conforms, removes the limitation on itemized deductions for upper-income taxpayers in 2010. However, starting with the 2009 tax year, New York State limits deductions to only 50 percent of the charitable contribution for taxpayers with incomes above $1 million. Additionally, for tax years 2010 through 2012, the charitable deduction for taxpayers with incomes above $10 million has been further limited to 25 percent. State taxpayers may also subtract from NYSAGI a $1,000 exemption for each dependent, not including the taxpayer and spouse, in determining taxable income.

A graduated tax rate schedule is applied to taxable income to compute the tax owed. In addition, those with NYSAGI above $100,000 must calculate a supplemental tax that "recaptures" the benefit of the lower brackets. Taxpayers arrive at their final tax liability after subtracting whatever credits they may qualify for.[2] Taxpayers who qualify for refundable credits, such as the Earned Income Tax Credit and Empire State Child Credit, may even owe "negative" liability, entitling them to a payment from the State.

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[1] The 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] Current State law allows the following major credits: Earned Income Tax Credit; Empire State Child Credit, household credit; child and dependent care credit; real property tax circuit breaker credit; agricultural property tax credit; long-term care insurance credit; college tuition credit; nursing home assessment credit, investment credit; and Empire Zone credits. However, usage of most business tax credits earned from 2010 through 2012 must be deferred until 2013-2015.

DATA SOURCES

Data on the personal income tax (PIT) come primarily from the NYS Department of Taxation and Finance, although ancillary data are obtained from the U.S. Internal Revenue Service (IRS). Detailed descriptions of these various data sources appear below.

PIT Study Files

PIT study files are created every year by the NYS Department of Taxation and Finance specifically for the purpose of analysis and research. The study file is a statistical sample of income tax returns stratified by region; income; filer type; resident status; whether the taxpayer itemizes deductions or claims the standard deduction; and whether the taxpayer claims one or more business credits, one or more personal credits, or no credits. The most recent study file pertains to the 2008 tax year and contains approximately 644,000 records. The study file contains detailed information, including: marital and resident status, components of income, Federal and NYS adjusted gross incomes, either the standard deduction or the components of itemized deductions, the number and amount of exemptions, tax liability, and credits. Since the study files contain only a sample of the taxpayer universe, each record has a weight assigned to it such that when file components are multiplied by the weights, the results can be assumed to represent a statistically accurate portrait of the actual New York State taxpayer profile.

Processing Reports

The Department of Taxation and Finance generates daily, weekly, and monthly collection reports on withholding, estimated payments, and those components of collections that are related to taxpayers' final settlement with the State for the previous tax year, i.e., their tax returns. The Division of the Budget monitors these data closely for the purposes of both forecasting and performing monthly cash flow analysis.

Each component of receipts follows a different payment and reporting schedule. Withholding information is reported on a daily basis, while estimated payments follow a quarterly schedule (April-June-September-January).[3] Final payments from taxpayers whose returns are accompanied by a remittance to the State tend to arrive during the March-April-May period, as well as during 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.

Tax return processing reports provide year-to-date data on the number of returns filed, tax liability, and NYSAGI well before the study file for the same tax year becomes

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[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 remitted, a cumulative aggregate amount of less than $700 at the close of a calendar quarter must remit the tax quarterly.

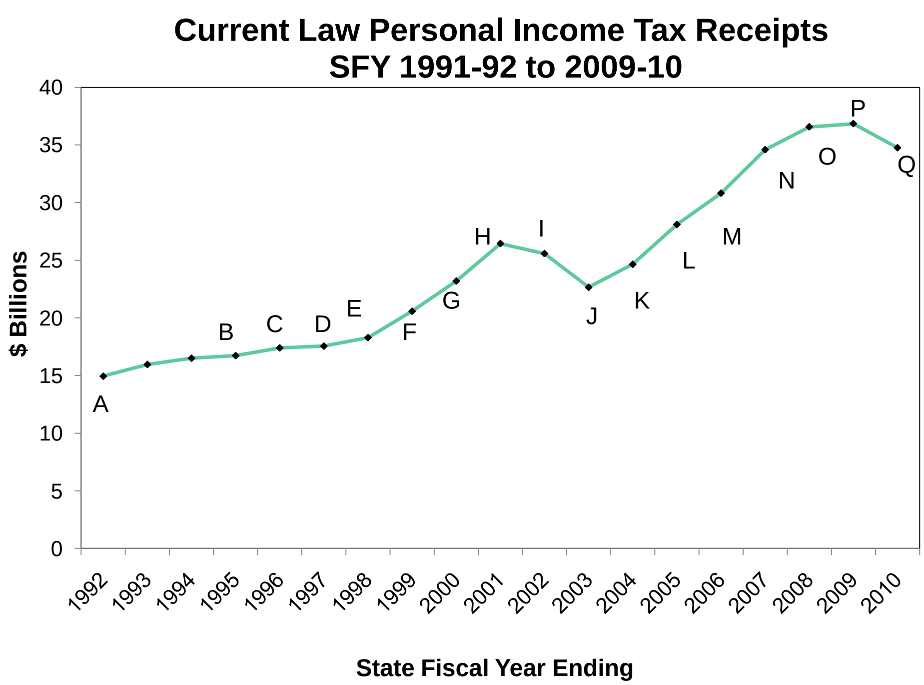
available. These data can be used as a reality check for the NYSAGI forecasting models, and model results are typically adjusted accordingly. Since the processing data also provide information on the distribution of returns, liability, and NYSAGI by income class and resident status, they also can be used to assess the results of the liability microsimulation model described in more detail below.

Federal Sources of Information

The Internal Revenue Service's Statistics of Income (SOI) program makes Federal data available on State resident taxpayers, through electronic data files and published reports. For instance, 2008 information on some of the income components for NYS residents was published in late spring of 2010 in the SOI Bulletin. Detailed information on the 2008 SOI public use data file became available during August 2010. The SOI information is useful in that it provides valuable Federal tax information that is not available from New York tax returns.

STATUTORY CHANGES

As indicated in the "Background" section, the State personal income tax law has been subjected to many changes over its history. The figure in this section shows actual PIT tax receipts for fiscal years 1991-92 to 2009-10. The graph also shows the law changes that occurred in that period, thus indicating when PIT receipts were first affected. Note that the receipts are not adjusted for inflation.



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: Reflects 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: Reflects the following changes: standard deduction increased to $6,600 for single individuals, $10,800 for married couples; maximum rate lowered to 7.59 percent and number of tax brackets reduced; EITC increased to 10 percent of the Federal credit.

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

E. 1997-98: Reflects creation of the Agricultural Property Tax Credit for the 1997 tax year. In addition, reflects these changes for the 1997 tax year: standard deduction raised to $7,500 for single individuals, $13,000 for married couples; maximum rate reduced to 6.85 percent and broadening of the wage brackets to which the rate is applied.

F. 1998-99: Reflects the following changes: increase in 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 calculation of the Agricultural Property Tax Credit; creation of the Solar Energy Credit; and of the College Choice Tuition Savings Program.

G. 1999-2000: For the Child and Dependent Care Credit, reflects increases in the income levels for the range of the 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: Reflects the following changes: an increase in the Child and Dependent Care Credit raising 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; an increase in the State EITC to 22.5 percent of the Federal credit; and extension of the Qualified Emerging Technology Credit (QETC) to individuals in partnerships or S corporations.

I. 2001-02: Reflects the following changes: a further increase in the State EITC to 25 percent of the Federal credit; the first phase of a three-year reduction of the marriage penalty; and providing the first phase of a four-year phase-in of the tuition deduction/credit.

J. 2002-03: Reflects the following changes: a further increase of the State EITC to 27.5 percent of the Federal credit; providing the second phase of the three-year reduction of the marriage penalty; and the second phase of the four-year phase-in of the tuition deduction/credit.

K. 2003-04: Reflects the following changes: implementation of a three-year temporary surcharge on high-income taxpayers, adopted in 2003, with the second-highest rate falling from 7.5 percent in 2003 to 7.375 percent in 2004 and to 7.25 percent in 2005 and a top rate of 7.7 percent in all three years; an increase in the State EITC to 30 percent of the Federal credit; provision of the final phase of a three-year reduction of the marriage penalty; and of the third phase of a four-year phase-in of the tuition deduction/credit.

L. 2004-05: Reflects the following changes: continued application of the three-year temporary surcharge; increase in the long-term care insurance credit from 10 to 20 percent; and inclusion of gain from the sale of cooperative housing as NY-source income for nonresidents.

M. 2005-06: Reflects the following changes: continued application of the three-year temporary surcharge, though the final quarter does not include any additional withholding tax because the surcharge expired on 1/1/06; new credit for individual payers of the nursing home assessment.

N. 2006-07: Reflects the following changes: expiration of the temporary personal income tax surcharge reducing the highest tax rate back to 6.85 percent, and the new Empire State Child Credit.

O. 2007-08: Reflects the following changes: elimination of the marriage penalty in the standard deduction; creation of a new earned income credit for noncustodial parents; expansions in the farmers school tax, film and commercial production credits; and new credits for replacing home heating systems and using bio-heat fuel.

P. 2008-09: Reflects the following changes: restructuring of fees on limited liability companies; enactment of various compliance and enforcement initiatives.

Q. 2009-10: Reflects the following changes: implementation of a three-year temporary rate increase on high income taxpayers by increasing the highest tax rate to 8.97 percent and creating two new tax brackets applicable to taxpayers with incomes over $300,000 and over $500,000; an increase in the limitation of itemized deductions applicable to high income taxpayers from 50 percent to 100 percent except for the deduction for charitable contributions; reform of the Empire Zones program by subjecting all companies that had been certified for at least three years to a performance review focusing on cost/benefit ratios; and levying fees on non-LLC partnerships with NY-source income at or above $1 million at the same rates currently applicable to LLC partnerships.

FORECAST METHODOLOGY

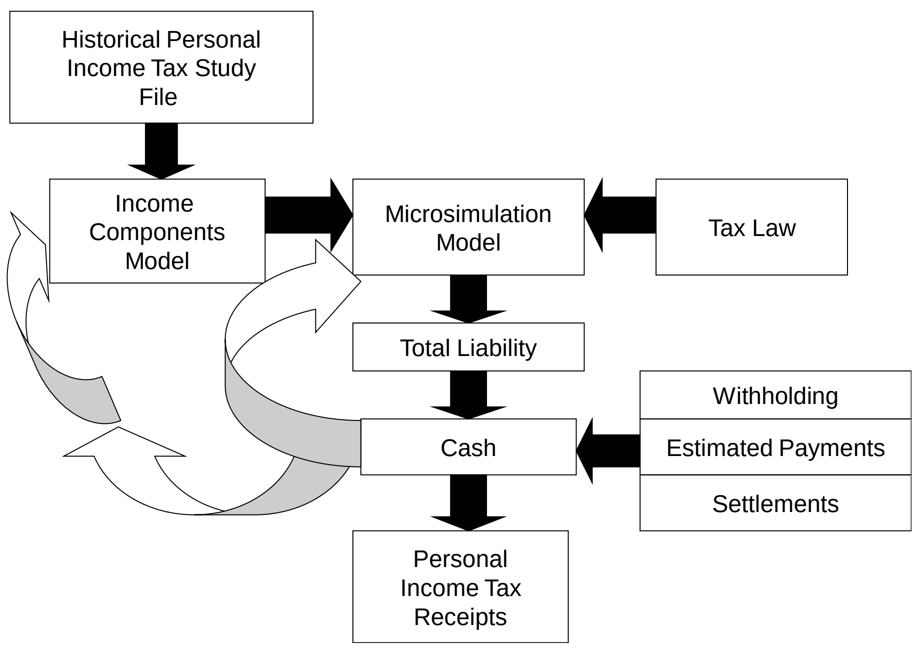
The estimating/forecasting process for the NYS personal income tax is composed of three major components. They are:

1. **The NYS adjusted gross income (NYSAGI) models**, which comprises a set of single-equation econometric models that project the individual components of gross taxable income;

2. **The PIT microsimulation model**, which combines the results from the NYSAGI models with the microdata from the PIT study file to forecast PIT liability. Microsimulation is also used to assess the impact of tax law changes.

3. **The liability-to-cash models**, which map calendar-year liability to fiscal-year cash estimates and monitor day-to-day actual cash receipts and refunds.

Components of the NYS PIT Forecasting Process



As shown in the figure above, all three components of the estimation and forecasting process are closely interconnected.

- Information on individual income components from historical PIT study files is used to construct a database for the various forecasting models for the components of NYSAGI. Given the lag with which tax return data become available (the 2008 PIT study file is the latest available), the forecast results from these models are often adjusted to reflect the latest available cash information, which as of November 2010 exists for almost all of tax year 2009 and much of 2010. The adjusted results become key inputs to the liability microsimulation model.

- The most recent PIT study file is the starting point for the microsimulation model. In order to compute liability beyond the base year, taxpayer incomes are trended forward by growing the individual components of income and by adjusting the study file weights to reflect the results from the NYSAGI models.

- The liability forecast from the PIT microsimulation model is used to project cash receipts for future years.

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

Detail on the NYSAGI forecasting model can be found in the "New York State Adjusted Gross Income" chapter of this report. The following section describes each of the remaining components of the PIT forecasting process.

The PIT Microsimulation Model

The PIT microsimulation model generates forecasts of PIT liability for future years and can also be used to estimate the impact of tax law changes on overall liability and on different taxpayer groups. Examples of tax law changes include changes in the standard deduction or exemption amounts, changes in the tax rate schedule, and changes in various tax credits.

The process of forecasting liability proceeds in two steps. The first step is to "advance" or "trend" the most recent study file into future tax years. This is done sequentially; for example, the PIT liability projections will require forecasts of aggregate gross income components and the number of tax returns from the NYSAGI models for 2009 and beyond. Thus, the 2008 study file forms the base for the "trended" 2009 dataset, which in turn becomes the base for creating the 2010 trended dataset, and so on. Once this is done for any given year, the new "trended" dataset can be submitted to the second step, which is the computation of tax liability, given taxpayers' trended incomes and existing tax law for that year. This second step is essentially the application of a PIT tax liability calculator that follows the structure of the State tax form.

The NYSAGI models forecast aggregate growth rates for all of the components of gross income. However, the microsimulation model allows these growth rates to vary by income for the six largest components of gross income for residents – wages and salaries, positive capital gains realizations, positive partnership and S corporation gains, dividend income, interest income, and proprietors and farm income – as well as for nonresident wages and salaries. These growth rates are determined by a set of econometric models that forecast the shares of the major components by income deciles. These shares are constrained to add to unity, ensuring that the aggregate income targets are met. Income deciles are determined based on the taxpayer's NYSAGI. For nonresidents, this measure of income is derived from that portion of gross income for which the source is designated by the taxpayer to be New York State. Prior to estimation, the deciles whose shares tend to rise and fall together over time are grouped. The share estimating equations typically include variables that are forecast within the U.S. and New York State macroeconomic models, as well as growth in the aggregate component itself.

After estimating the decile growth rates for the major income components, the most recent study file can be trended forward to the next year. Residents and nonresidents are trended separately. In the first step of the trending process for residents, individual taxpayer record weights are advanced by the projected growth in the total number of resident returns.[4] In the second step, the six major components of gross income listed above are advanced by the projected decile-specific growth rates, discounted for the growth in the total number of returns. In the third step, the record weights are adjusted yet again to ensure that the aggregate income component targets implied by the NYSAGI model forecast are met precisely. Following the U.S. Treasury Department methodology, a loss function is constructed that equally penalizes upward and downward adjustments to the existing weights. Weight adjustments are chosen to minimize this loss function subject to meeting the aggregate income targets, implying an objective function of the following form:

$$\mathcal{L} = \sum_{i=1}^{I}\left[n_i w_i (x_i^4 + x_i^{-4})\right] + \sum_{j=1}^{6}\lambda_j (y_j - \sum_{i=1}^{I} x_i w_i y_{ij})$$

Where:

I is the number of weight classes,
n_i is the number of records in the i^{th} weight class,
w_i is the existing weight for the i^{th} weight class,
x_i is the adjustment to the existing weight for the i^{th} weight class,
λ_j is the Lagrange multiplier for the j^{th} major income component,
y_j is the aggregate target for the j^{th} major income component, and
y_{ij} is the unweighted total for the j^{th} major income component for income class i.

In the final step of the trending process, the remaining components of taxpayer income are trended forward at the rates projected by the NYSAGI models, discounted by the growth in the weights. The entire procedure is repeated for nonresidents, except that decile-specific rates are applied only to wages, and the minimization of the weight adjustment loss function is constrained only by the need to satisfy the total nonresident wage target. The final trended dataset forms the base for trending forward to the following year.

Once a trended dataset has been created, it can then be submitted to the "liability calculator." This component of the microsimulation makes use of all of the available information on each taxpayer's record to compute NYSAGI, allowable deductions and exemptions, taxable income, and all of the various allowable credits in order to compute that taxpayer's total tax liability. Total State liability is the weighted sum over all of the individual taxpayer records in the dataset, where the sum of the weights corresponds to

[4] Details on the forecasting model for the total number of resident returns can be found in the "New York State Adjusted Gross Income" chapter of this book.

the size of the total taxpaying population of the State. The impact of alternative tax regimes on total State liability can be simulated by adjusting model parameters, such as the tax rates, and repeating the tax calculating process.

The Liability-to-Cash Process

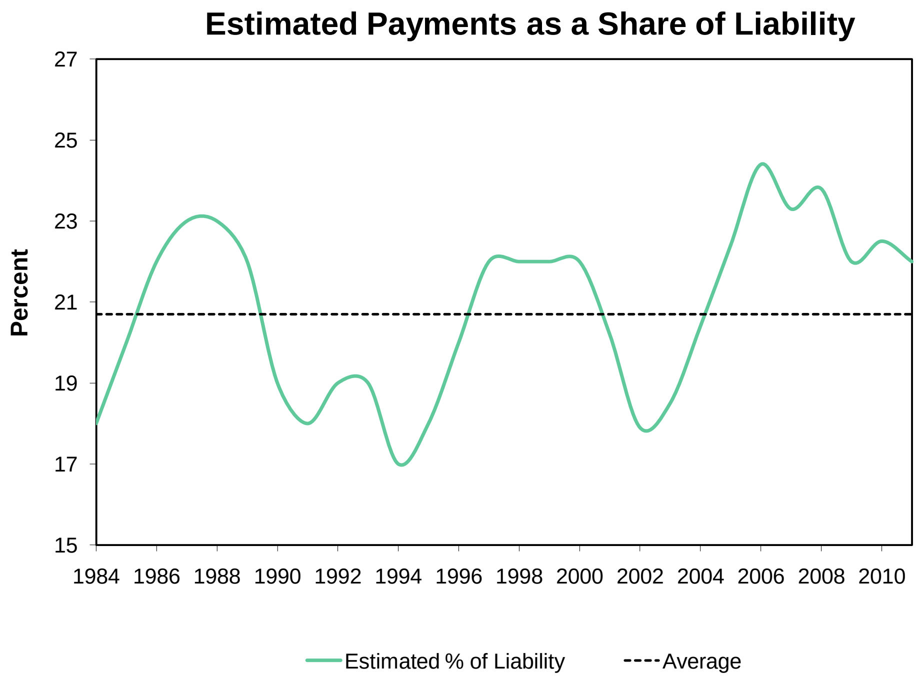
The liability-to-cash process involves monitoring all available collection information for the different components of the personal income tax to better estimate current year receipts and to improve our estimates of current year liability. Year-to-year liability growth, along with the actual daily, weekly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

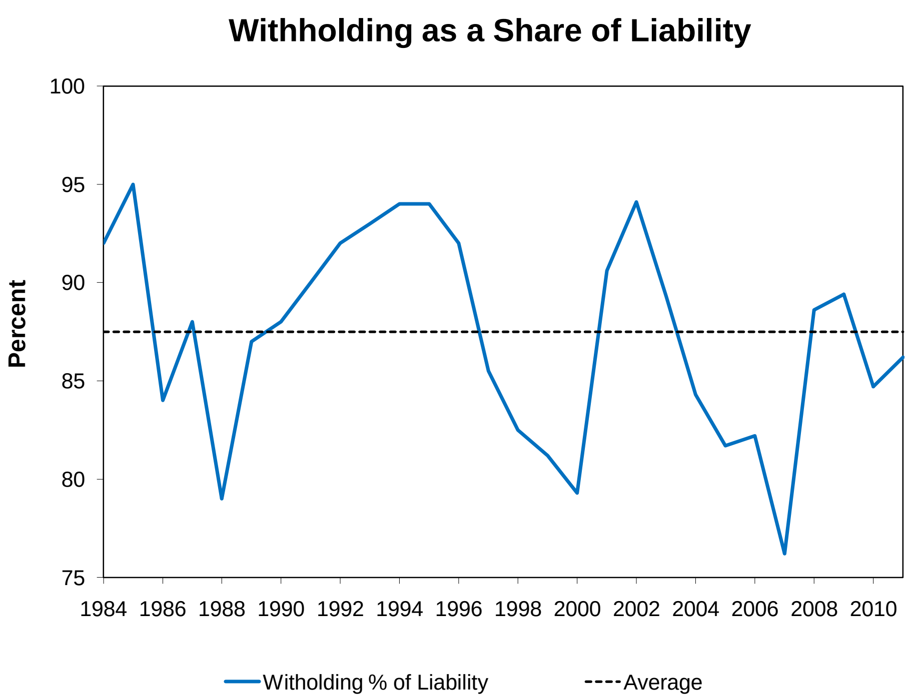
The components of PIT cash receipts for a fiscal year include withholding (current year and prior year), estimated payments (current year payments and extension payments for the prior tax year), final returns, delinquencies (assessments and payments related to prior year returns), and refunds (current, prior, minor offsets, State/City offsets, credit to estimated payments). Final returns, extension payments, and refunds comprise the components of taxpayers' final "settlement" of their tax liabilities. The table below lists the actual and estimated components of PIT cash for the 2009-10 and 2010-11 State fiscal years.

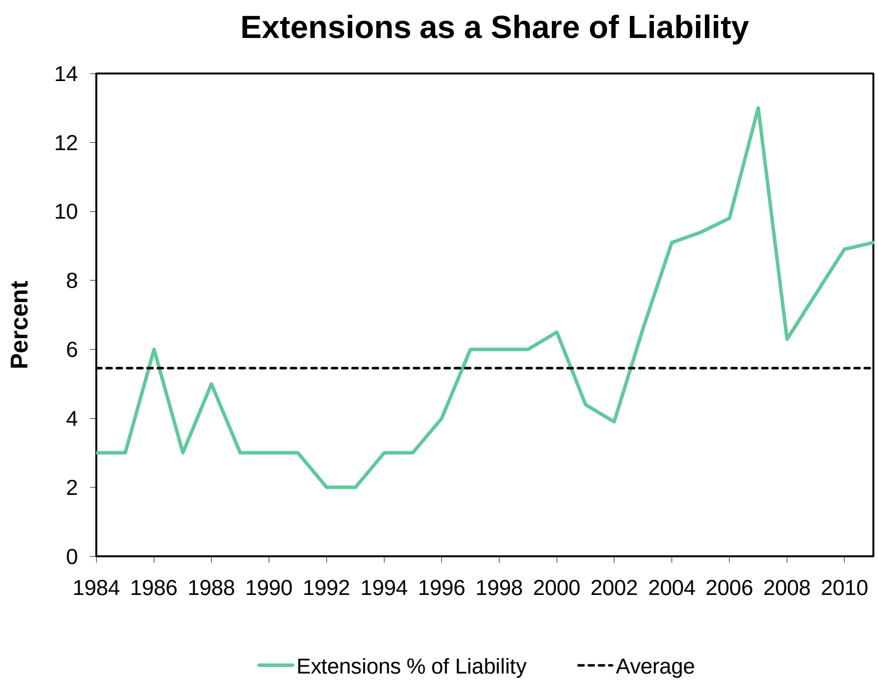
COMPONENTS OF PIT CASH
2009-10 AND 2010-11 FISCAL YEARS
(millions of dollars)

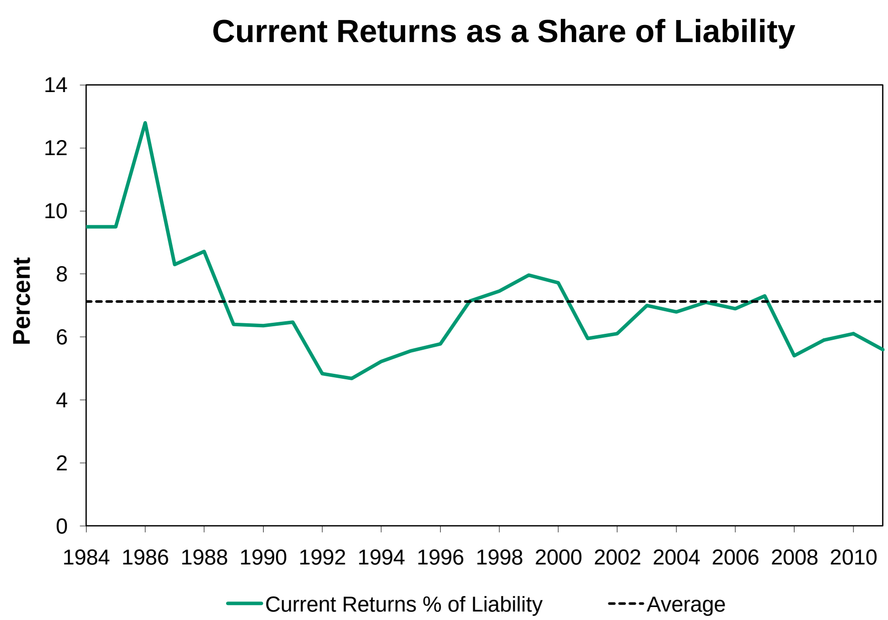
PIT Component	2009-10 Actual	2010-11 Estimate	Change	Change (Percent)
Withholding	**29,443**	**31,301**	**1,858**	**6.3**
Estimated Tax	**9,028**	**10,351**	**1,323**	**14.7**
Current	6,938	7,944	1,006	14.5
Prior (IT-370s)	2,090	2,407	317	15.2
Returns	**1,822**	**1,973**	**151**	**8.3**
Current	1,616	1,766	150	9.3
Subsequent	206	207	1	0.4
Delinquencies	**1,100**	**1,161**	**61**	**5.5**
Assessed	978	1,059	81	8.3
Returns (prior)	123	102	(21)	(16.8)
Gross	**41,393**	**44,786**	**3,393**	**8.2**
Refunds	**6,642**	**8,189**	**1,547**	**23.3**
Current	4,986	5,502	516	10.4
Refunds	4,747	5,303	556	11.7
Offsets	239	199	(40)	(16.6)
Subsequent	1,250	1,750	500	40.0
Prior w/offsets	468	689	221	47.2
State/City	-62	248	310	(500.0)
Net Total	**34,751**	**36,597**	**1,846**	**5.3**
"STAR"				
Special Fund	**(3,409)**	**(3,300)**	**109**	
RBTF	**(8,688)**	**(9,149)**	**(461)**	**5.3**
General Fund	**22,654**	**24,147**	**1,493**	**6.6**

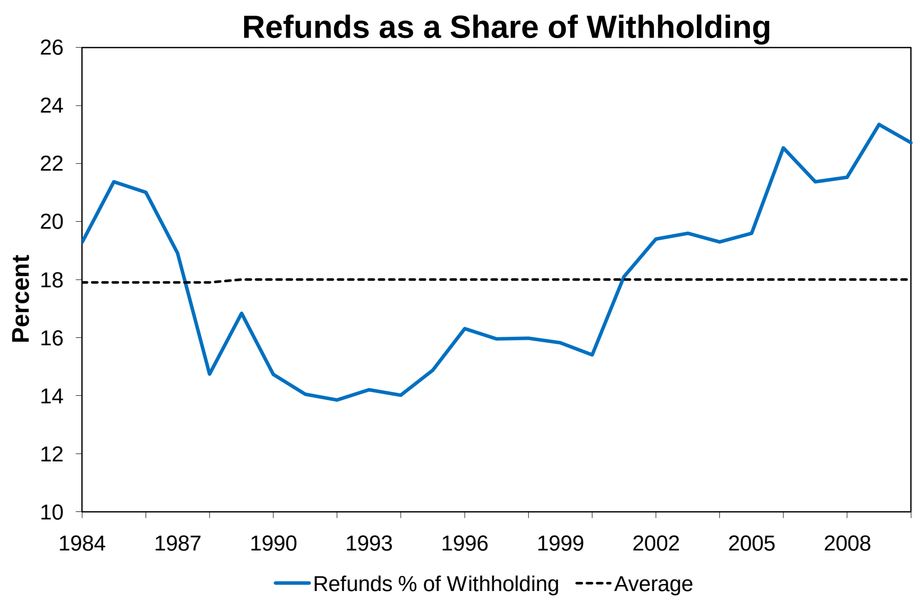
The following six graphs show the components of cash liability over time, namely estimated payments, withholding, extensions, and final return payments as a percentage of tax year liability; refunds paid as a share of withholding collections; and the major components of PIT cash for the 2009-10 State fiscal year. Note the tendency for the cash components to return to an average percentage of liability. However, the components can deviate significantly from this average in a given year. This tendency to revert to average cash-to-liability ratios forms the basis for the PIT components econometric model described below.

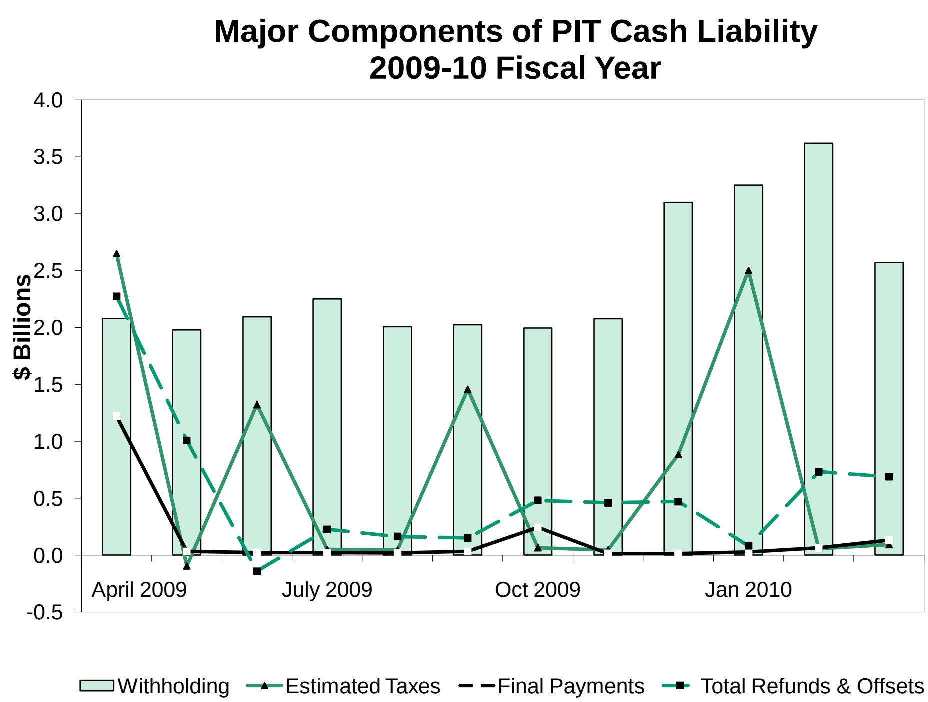

Estimated Payments as a Share of Liability
Percent
27
25
23
21
19
17
15
1984 1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010
Estimated % of Liability
Average


Withholding as a Share of Liability
Percent
100
95
90
85
80
75
1984 1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010
Witholding % of Liability
Average


Extensions as a Share of Liability
Percent
14
12
10
8
6
4
2
0
1984 1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010
Extensions % of Liability
Average


Current Returns as a Share of Liability
Percent
14
12
10
8
6
4
2
0
1984 1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010
Current Returns % of Liability
Average





As discussed earlier, information regarding the various components of tax collections is received on a daily, weekly, and monthly basis. Staff monitor tax collections and other information closely throughout the year to assess actual receipts performance versus estimates. For example, withholding collections which amounted to over $29 billion in 2009-10, or about 85 percent of total net collections, are generally monitored 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.

A comprehensive personal income tax cash collection report 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. Staff then compare the actual collections data in this report with the original estimates for the month, and for the entire fiscal year. At the end of each quarter, this information is used, along with historical information and Tax Law 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 model as a benchmark. Various methodologies are applied for different components of receipts.

The largest component of income tax collections, withholding, is estimated based on quarterly forecasts of NYS wages. Withholding is estimated using two alternative methodologies. The first method is based on a model wherein withholding is the dependent variable and state wages are the main independent variable, with both variables in log-level form, allowing the coefficients to be interpreted as elasticities. The wage impact is expected to vary by quarter, due to the seasonal impact imparted by bonus payouts, combined with the progressive nature of the tax. To capture this effect, wages are represented by four variables constructed by multiplying the logarithm of wages by a dummy variable for each quarter. Some additional dummy variables are added to control for law changes, giving the resulting elasticities a constant-law interpretation; the elasticities are presented in the table below. Consistent with a priori expectations, the estimated elasticities are all greater than one, implying that withholding increases (decreases) at a faster rate than wages as people move through the graduated tax brackets. Future values of withholding growth are projected by applying the appropriate elasticity to the projected growth rates for wages on a quarterly basis.

CONSTANT LAW WITHHOLDING ELASTICITIES

Calendar Quarter	Long-Run Elasticity*	Standard Error
Quarter 1	1.29	0.033
Quarter 2	1.24	0.038
Quarter 3	1.23	0.039
Quarter 4	1.24	0.036

*Percent change in withholding resulting from a one percent change in wages.

The second method similarly regresses withholding on various independent variables, including wages and shift variables reflecting law changes. In this specification, the log-levels of withholding and wages are differenced with the same quarter of the prior year. Short-run dynamics are captured by including a lagged value of the dependent variable. The model is estimated using quarterly data starting in 1975 and running through the second quarter of 2010. The summary table below shows that the model fit is good; moreover, there is no evidence of serial correlation. Model results indicate that the elasticity of withholding with respect to wages is greater than otherwise when wage growth is unusually high, surpassing 8 percent. The tax dummy variable coefficients are of the right sign and for the most recent law changes (dating back to 1985) are statistically significant at the 5 percent level or better.

WITHHOLDING

$$\Delta_4 \ln WITH_t = \underset{(0.05)}{0.23}\,\Delta_4 \ln WITH_{t-1} + \underset{(0.06)}{0.91}\,\Delta_4 \ln NYSWAGE_t + \underset{(0.00)}{0.01}\,DWG_t - \underset{(0.01)}{0.03}\,TAX1_t - \underset{(0.02)}{0.08}\,TAX2_t$$
$$+ \underset{(0.02)}{0.13}\,TAX3_t - \underset{(0.02)}{0.03}\,TAX4_t - \underset{(0.02)}{0.07}\,TAX5_t + \underset{(0.02)}{0.07}\,TAX6_t + \underset{(0.02)}{0.04}\,TAX7_t + \underset{(0.01)}{0.05}\,TAX8_t$$

$$Adjusted\ R^2 = 0.74$$
$$RMSE = 0.03$$
$$Number\ of\ Observations = 143$$

WITH	Withholding
NYSWAGE	Total NYS wages
DWG	Dummy equal 1 when quarterly wage growth rate is greater than 8, 0 otherwise;

Note: The dummy variables TAX1 through TAX8 equal 1 in the following time periods, 0 otherwise:

TAX1	Third quarter of 1985 and thereafter, reduction in top tax rate, increased personal exemption and standard deduction
TAX2	Fourth quarter of 1987 and thereafter, reduction in top tax rate and adopted individual bracket structure for all, increased personal exemption and standard deduction
TAX3	Fourth quarter of 1988 and thereafter, reduction in the top tax rate, increased standard deduction
TAX4	Fourth quarter of 1989 and thereafter, adopted new rate schedule with top rate of 7.875, increased standard deduction
TAX5	Second quarter of 1996 and thereafter, reduction in the top tax rate and broadened wage brackets, increased standard deduction
TAX6	Second quarter of 1997 and thereafter, reduction in the top rate and broadened wage brackets, increased standard deduction
TAX7	Third quarter of 2003 through fourth quarter of 2004. The dummy is reduced from 1 gradually over the phase-out range of the temporary surcharge
TAX8	Second quarter of 2009 through fourth quarter of 2011. Withholding tax surcharge.

Note: Values in parentheses under coefficients represent standard errors.

For the 2010-11 Mid-Year Financial Plan Update, the two alternative estimation procedures produce very similar results for the forecast period.

Non-withholding cash components are also 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 produce the outyear forecast.

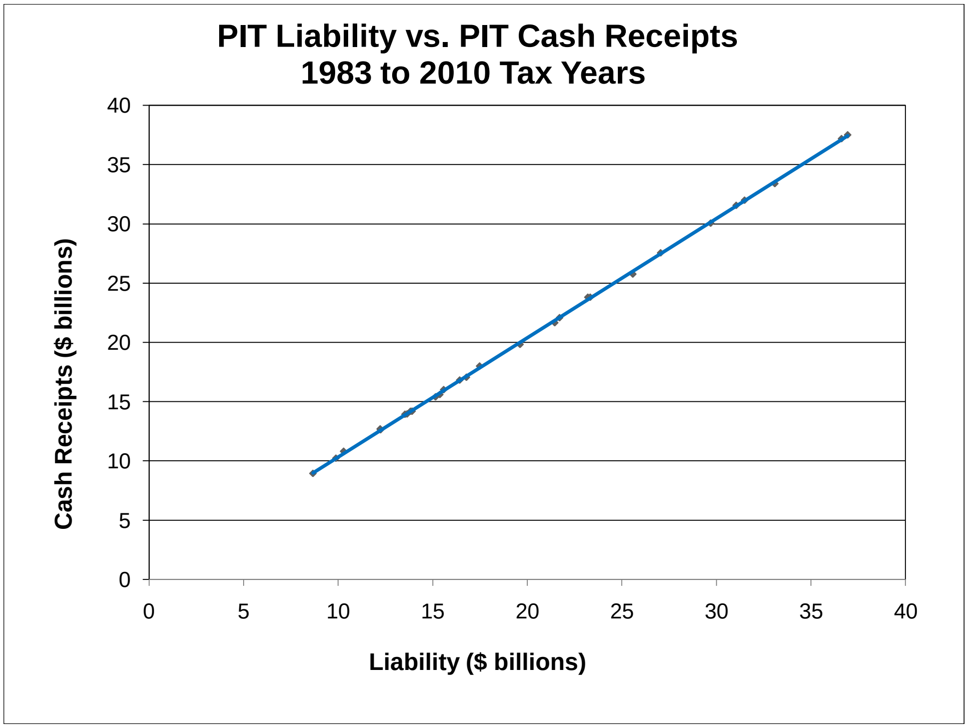
Structural Cash Component Model

The second method uses an econometric approach to estimate the non-withholding components of income tax collections. The new model is a simultaneous system of equations where the primary independent variables are overall liability and withholding.

Since the sum of the positive (e.g., estimated tax) and negative (e.g., current year refunds) components of cash collections roughly equal total liability, movements in these components over time should ultimately be driven by changes in liability.[5] The graph

[5] Even if cash collections could be precisely identified with a tax year, collections and liability might not be exactly equal. Cash collections tend to exceed liability for a given tax year since, for example, not every taxpayer who has taxes withheld from a paycheck or makes a quarterly estimated payment files a tax return. Consequently, total cash collections corresponding to a particular tax year exceed the liability

shown below shows the extremely close relationship between cash received and liability reported on returns. However, the relationship between the individual cash components and liability has not been constant. The model described here attempts to account for this variation.



The model specifications for the major non-withholding cash components are presented in the table below. The system is estimated using ordinary least squares. The data are annual and cover the period from 1983 to 2009. The system is closed with an identity that sets the sum of the components equal to total cash payments.

While the ratio method was used to construct our estimates, the structural model is used as a check on the reasonableness of these results. In general, the two methods tend to provide similar estimates of cash collections on a fiscal year basis. 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, though the primary source of forecast error is the uncertainty surrounding the forecasts for future tax liability.

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reported on returns filed for that year. The value of this discrepancy varies from year to year, averaging about 1.5 percent of liability over the period from 1999 to 2008, the most recent 10 years for which data are available.

NON-WITHHOLDING COMPONENTS OF PIT CASH COLLECTIONS

Estimated Tax Payments

$$\Delta \ln EST_t = \underset{(0.04)}{0.242}\,\Delta \ln PSG_t + \underset{(0.01)}{0.428}\,\Delta \ln NCG_t + \underset{(0.07)}{0.158}\,\Delta \ln BUS_{t-1}$$

Adjusted $R^2 = .74$

$RMSE = 0.07$

Number of Observations $= 27$

Payments with Extension Filings (IT370s)

$$\Delta \ln IT370_t = \underset{(-0.11)}{-0.208}\,\Delta \ln IT370_{t-1} + \underset{(0.11)}{0.80}\,\Delta \ln PSG_t + \underset{(0.31)}{0.614}\,\Delta \ln NCG_{t-1} + \underset{(0.13)}{0.206}\,\Delta TXRATE_t$$

Adjusted $R^2 = .71$

$RMSE = 0.18$

Number of Observations $= 27$

Final Payments

$$\Delta \ln FINAL_t = \underset{(0.04)}{0.531}\,\Delta \ln IT370_t + \underset{(0.16)}{0.298}\,\Delta \ln NYSEMP_{t-1}$$

Adjusted $R^2 = .86$

$RMSE = 0.07$

Number of Observations $= 27$

Refund Payments

$$\Delta \ln REF_t = \underset{(0.06)}{0.097}\,\Delta \ln REF_{t-2} + \underset{(0.05)}{0.868}\,\Delta \ln WITH_t + \underset{(0.06)}{0.142}\,\Delta \ln(LIAB_t - WITH_t)$$

Adjusted $R^2 = .90$

$RMSE = 0.03$

Number of Observations $= 27$

EST	Estimated payments
PSG	Positive partnership and S corporation gains
NCG	Net capital gains realizations
BUS	Small business and farm income
IT370	IT370 payments
TXRATE	Combined top marginal Federal and NYS income tax tates
FINAL	Final payments
NYSEMP	Total NYS nonfarm employment
REF	Refund payments
WITH	Withholding
LIAB	Liability

Note: Values in parentheses under coefficients represent standard errors.

Cashflow Patterns

The personal income tax cash impact varies by quarter during the fiscal year. This reflects such factors as the timing of bonus payments subject to withholding (especially December-February), the quarterly due dates for estimated tax (April, June, September and January), the payment of refunds on filed tax returns (February-May), and remittances accompanying returns or extensions to file (April). As a result, the share of total net cash receipts is highest in the first and fourth quarters, due to payments with tax returns and bonus withholding/fourth quarter estimated tax installments, respectively. The following table shows net collections by fiscal year quarter in recent years:

PERCENTAGE DISTRIBUTION OF CASH RECEIPTS				
	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
2001-02	30.8	20.4	22.5	26.2
2002-03	25.5	22.9	22.8	28.8
2003-04	21.5	23.1	23.8	31.6
2004-05	24.2	21.8	23.0	31.0
2005-06	26.5	20.3	21.0	20.7
2006-07	28.0	20.8	19.2	32.0
2007-08	27.2	21.7	19.4	31.5
2008-09	33.4	22.2	19.2	25.2
2009-10	23.5	21.9	22.2	32.4
2010-11 (est)	23.7	21.6	22.2	32.5

Risks to the Liability Forecast

The PIT liability forecast is subject to all of the risks that pertain to the forecast of wages and the other components of taxable income. These risks are particularly pronounced for New York State since a significant portion of taxpayer income is tied to the direction of equity markets, financial services industry profits, and real estate activity, all of which have been shown to be extremely volatile. The predominance of those income components that are tied to these volatile areas of the economy, such as capital gains realizations, bonuses and stock incentive payouts, and the concentration of such income in the hands of a relatively small number of high-income taxpayers pose significant risks to the personal income tax forecast. This year, in particular, the uncertainty surrounding taxpayer behavior in response to the expiration of the Bush tax cuts at the end of 2010 on capital gains and dividends adds further risks. The implementation of the temporary rate increase for tax years 2009 through 2011 also adds another layer of risk to the 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 generating 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 tax of up to 3 percent, although most have temporary authorizations to impose the tax at a higher rate. New York City and 46 counties currently have a State and local combined rate of 8 percent or more, including the 0.375 percent sales tax imposed in the Metropolitan Commuter Transportation District. The highest combined State and local rate is 8.875 percent in New York City.

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. There are certain exemptions such as food, prescription drugs, residential energy and college textbooks. 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). The collections for the first 22 days of the month must be remitted electronically within three business days after the 22nd day.

DATA SOURCES

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

- AS043, 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 AS043 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

For forecasting purposes, the Division of the Budget adjusts actual sales and use tax receipts for Tax Law changes, and administrative and other changes to produce a series that correlates more closely with the taxable sales base.

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

- Large statutory 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 vendors' 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;
- Suspension of the permanent clothing exemption between June 1, 2003, and March 31, 2006, replaced by two exemption weeks annually at a threshold of $110 per item;
- Sales tax cap on motor fuel and diesel motor fuel at $2 per gallon beginning June 1, 2006;
- Suspension of the exemption for clothing and shoes priced under $110 per item from October 1, 2010, to March 31, 2011 and partial restoration to $55 per item from April 1, 2011 to March 31, 2012.

FORECAST METHODOLOGY

Cash collections are reduced by credits and increased by collections from audits and other administrative processes that, due to statutory 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. These models were most recently estimated with 114 observations of quarterly data (1982:1 to 2010:2). The year-over-year growth rates from each of the three equations are weighted and averaged together to obtain a single growth rate forecast of the taxable sales base.

The left-hand-side variable for each equation is the logarithm of adjusted quarterly collections minus the logarithm of collections for the same quarter of the prior year. Differencing in this way removes the seasonality in collections. A dummy variable appears in each equation accounting for a change in the tax law governing the clothing exemption. On March 1, 2000, items of clothing and shoes costing less than $110 were exempted from the sales and use tax. The dummy variable corrects for this law change. In the wake of September 11, the year-long exemption was temporarily suspended in favor of shorter periods of exemption and the left-hand-side variable is adjusted for this change. The permanent exemption of clothing and footwear under $110 was reinstated on April 1, 2006. Additional dummy variables are included to account for more minor law changes and outliers.

EQUATION 1: TAXABLE CONSUMPTION

This model uses two taxable consumption variables, consumption of taxable goods and consumption of taxable services, to explain the nominal level of collections. 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 used as an estimate of New York's share of U.S. taxable consumption. To account for the lag between collections and the underlying economic activity generating those receipts, taxable consumption includes one third of prior quarter and two thirds of current quarter consumer spending. The variables in the model, including the dependent variable, are in logs and are differenced from a year ago. Dummy variables are also included, one to account for changes in the clothing exemption and three for outliers.

Consumption of Taxable Goods and Services in New York

Detailed components of nominal U.S. consumption of durable and non-durable goods are weighted based on what percentage is estimated to be taxable in New York. These weighted components are then summed and multiplied by the ratio of New York to U.S. employment to estimate State taxable consumption of durable and non-durable goods. To more closely capture the lag between economic activity and tax collections, one third of the prior quarter's State taxable consumption is added to two thirds of the current quarter value.

As for goods, detailed components of nominal U.S. consumption of services are weighted based on what percentage is estimated to be taxable in New York. The same steps taken for goods to estimate State consumption and adjust for the collections lag are repeated for services.

Other Economy Related Explanatory Variables

The fourth difference of the log of U.S. investment in equipment and software, lagged one period, is used to capture the sales taxes paid by businesses.

The log of the current-period value of the S&P 500 index minus the log of the value for the same quarter of the prior year captures the importance of the financial sector to the New York economy.

The model specification appears below:

TAXABLE CONSUMPTION EQUATION

$$\Delta_4 \ln SALESAdj_t = \underset{(0.005)}{-0.020} + \underset{(0.089)}{0.601}\,\Delta_4 \ln CDNTX_t + \underset{(0.108)}{0.595}\,\Delta_4 \ln CSTX_t + \underset{(0.034)}{0.098}\,\Delta_4 \ln IPDENR_t$$
$$+ \underset{(0.014)}{0.028}\,\Delta_4 \ln SP500_t - \underset{(0.012)}{0.062}\,DUMCLOTH_t + \underset{(0.021)}{0.084}\,DUM1986_t + \underset{(0.015)}{0.039}\,DUM2004_t$$
$$+ \underset{(0.011)}{0.025}\,DUM1990_t$$

$Adjusted\ R^2 = 0.80$

$RMSE = 0.021$

$Number\ of\ Observations = 114$

SALESAdj	Adjusted quarterly sales tax receipts
CDNTX	Taxable durable and nondurable consumption goods
CSTX	Taxable services
IPDENR	Investment in equipment and software
SP500	S&P 500 index
DUMCLOTH	Clothing dummy
DUM1986	Dummy variable (=1 for 1986 Q1; 0 elsewhere)
DUM2004	Dummy variable (=1 for 2004 Q1 and Q2; 0 elsewhere)
DUM1990	Dummy variable for cable exclusion

Note: Values in parentheses under coefficients represent standard errors.

PERCENT CHANGE IN EXOGENOUS VARIABLES — STATE FISCAL YEARS 2001-02 TO 2010-11										
	01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10	10-11 (est.)
Consumption of goods in NY	1.9	3.2	4.8	6.1	6.1	3.6	4.8	(1.4)	(2.4)	5.2
Consumption of services in NY	1.4	2.4	5.1	5.1	5.0	5.0	5.7	3.1	(0.1)	3.4
S&P Index	(16.9)	(19.7)	11.2	11.0	7.4	9.5	8.3	(25.5)	(5.5)	12.0

EQUATION 2: ERROR CORRECTION MODEL WITH STATE INCOME AND EMPLOYMENT

This model exploits the long-run equilibrium relationship between sales tax receipts and New York State disposable income and total nonfarm employment. That relationship is estimated and the lagged deviations appear on the right-hand-side of the sales tax model within an error correction model framework that allows for a gradual dynamic adjustment back toward equilibrium. Consistent with that framework, the model also includes the year-ago differences in State disposable income and employment. Also appearing on the right-hand-side are a lagged value of the dependent variable, the S&P 500, and three dummy variables, one to account for changes in the clothing exemption and the other two for outliers.

Economy Related Variables

The log of current-quarter total nonfarm New York State employment minus the log of the value for the same quarter of the prior year.

The log of current-quarter New York disposable income minus the log of the value for the same quarter of the prior year.

The log of the current-period value of the S&P 500 index minus the log of the value for the same quarter of the prior year captures the importance of the financial sector to the New York economy.

The model specification appears below:

ERROR CORRECTION MODEL INCLUDING INCOME AND EMPLOYMENT

Error Correction Model:

$$\Delta_4 \ln SALESAdj_t = \underset{(0.077)}{0.323}\ \Delta_4 \ln SALESAdj_{t-1} - \underset{(0.045)}{0.102}\ RESID_t + \underset{(0.189)}{0.788}\ \Delta_4 \ln EMPTOT_t + \underset{(0.068)}{0.391}\ \Delta_4 \ln YDNY_t$$
$$+ \underset{(0.015)}{0.071}\ \Delta_4 \ln SP500_t - \underset{(0.014)}{0.032}\ DUMCLOTH_t + \underset{(0.026)}{0.050}\ DUM1986_t + \underset{(0.019)}{0.038}\ \mathrm{DUM2004}_t$$

$Adjusted\ R^2 = 0.70$

$RMSE = 0.025$

$Number\ of\ Observations = 114$

Long term equation:

$$\ln SALESAdj_t = \underset{(0.005)}{1.092}\ \ln EMPTOT_t + \underset{(0.007)}{0.735}\ \ln YDNY_t + \underset{(0.006)}{0.051}\ SEASONQ3_t$$

$Adjusted\ R^2 = 0.99$

$RMSE = 0.029$

SALESAdj	Adjusted quarterly sales tax receipts
RESID	Residual from the long term equation
EMPTOT	NY employment
YDNY	NY disposable income
SP500	S&P 500 index
DUMCLOTH	Clothing dummy
DUM1986	Dummy variable (=1 for 1986 Q1; 0 elsewhere)
DUM2004	Dummy variable (=1 for 2004 Q1 and Q2; 0 elsewhere)
SEASONQ3	Seasonal dummy for third quarter

Note: Values in parentheses under coefficients represent standard errors.

PERCENT CHANGE IN EXOGENOUS VARIABLES — STATE FISCAL YEARS 2001-02 TO 2010-11

	01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10	10-11 (est.)
NY Disposable Income	1.3	4.6	4.4	6.3	5.2	7.4	6.2	2.1	3.0	3.6
NY Employment	(1.6)	(1.2)	(0.5)	0.9	0.9	1.1	1.4	(0.3)	(2.8)	0.2
S&P Index	(16.9)	(19.7)	11.2	11.0	7.4	9.5	8.3	(25.5)	(5.5)	12.0

EQUATION 3: AUTO SALES AND RETAIL TRADE EMPLOYMENT

This model exploits two alternative indicators of the growth in taxable sales. To capture the large portion of taxable sales that are attributable to the auto market, this model includes growth in the number of State vehicle registrations. Retail trade employment represents yet another indicator of the strength of taxable sales and is also included in the model. Also appearing on the right-hand-side are the S&P 500 and three dummy variables, one to account for changes in the clothing exemption and two for outliers. A forecasting model for vehicle registrations is also specified below.

Nominal Value of Auto and Light Truck Registrations

The logarithm of New York new auto and light truck registrations multiplied by the national average price of new light vehicles minus the logarithm of the same concept for the prior year. These data are not seasonally adjusted.

An additional model forecasts vehicle registrations in New York State. Vehicle registrations are explained by national light vehicle sales multiplied by the ratio of State to U.S employment to determine the share attributable to New York. Both contemporaneous and lagged auto sales are statistically significant in the model. In addition, the lagged value of the dependent variable and the year-ago change in 5-year Treasury yield are included, with the latter capturing borrowing costs. A dummy variable is included in the model to account for the inclusion of light trucks in the data series as of the first quarter of 1993.

Retail Trade Employment

It is expected that as retail sales grow, outlets will increase their demand for workers. Employment is an indicator of real economic activity, while sales tax receipts reflect changes in both real activity and prices. Therefore, retail employment is multiplied by a measure of the price level constructed to capture inflation trends unique to New York.

All variables except the price deflator are not seasonally adjusted. The model specification appears below:

VEHICLE SALES AND RETAIL EMPLOYMENT MODEL

$$\Delta_4 \ln VEHREGNY_t = \underset{(0.081)}{0.740}\ \Delta_4 \ln\left(SQLV_t * \frac{EMPNY_t}{EMPUS_t}\right) + \underset{(0.086)}{0.024}\ \Delta_4 \ln\left(SQLV_{t-1} * \frac{EMPNY_{t-1}}{EMPUS_{t-1}}\right) + \underset{(0.062)}{0.109}\ \Delta_4 \ln VEHREGNY_{t-1}$$
$$- \underset{(0.005)}{0.010}\ \Delta_4 RMGF5NS_{t-1} + \underset{(0.038)}{0.282}\ DUM1993_t$$

$$Adjusted\ R^2 = 0.70$$

$$RMSE = 0.072$$

$$\Delta_4 \ln SALESAdj_t = \underset{(0.003)}{-0.009} + \underset{(0.079)}{1.129}\ \Delta_4 \ln(EMP46_t * CPICOMP_t) + \underset{(0.016)}{0.054}\ \Delta_4 \ln NOMCARS_t + \underset{(0.013)}{0.059}\ \Delta_4 \ln SP500_t$$
$$- \underset{(0.012)}{0.029}\ DUMCLOTH_t + \underset{(0.016)}{0.053}\ DUM2004_t + \underset{(0.022)}{0.055}\ DUM1986_t$$

$$Adjusted\ R^2 = 0.78$$

$$RMSE = 0.022$$

$$NOMCARS_t = VEHREGNY_t * JPLV_t$$

$$Number\ of\ Observations = 114$$

VEHREGNY	Vehicle registrations in NY
SQLV	Light vehicle sales
EMPNY	NY Employment
EMPUS	US Employment
RMGF5NS	50-year bond rate
DUM1993	Dummy variable (=1 for 1993 Q1; 0 elsewhere)
JPLV	Average sales price of light vehicles
SALESADj	Adjusted quarterly sales tax receipts
EMP46	NY retail sector employment
CPICOMP	NYS CPI
NOMCARS	Nominal value of vehicles sold in NY
SP500	S&P 500 index
DUMCLOTH	Clothing dummy
DUM2004	Dummy variable (=1 for 2004 Q1 and Q2; 0 elsewhere)
DUM1986	Dummy variable (=1 for 1986 Q1; 0 elsewhere)

Note: Values in parentheses under coefficients represent standard errors.

PERCENT CHANGE IN EXOGENOUS VARIABLES — STATE FISCAL YEARS 2001-02 TO 2010-11

	01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10	10-11 (est.)
Nom. Value Autos/Light Trucks	8.5	3.1	2.7	(1.8)	0.3	(2.6)	8.0	(20.4)	(5.4)	3.5
CPI NY	2.4	2.5	2.6	3.6	3.6	3.4	3.1	3.1	0.5	1.6
Retail Trade Employment	(2.2)	(0.6)	(0.1)	1.8	0.9	0.7	1.6	(1.1)	(2.9)	0.2
S&P Index	(16.9)	(19.7)	11.2	11	7.4	9.5	8.3	(25.5)	(5.5)	12.0

Adjustments

Budget Division forecasts for the relevant economic variables are used to produce an estimate of underlying growth in base receipts. This growth rate is arrived at by taking a weighted average of the forecasts from the three models described above and applying it to a prior year sales tax receipt base that has also been adjusted for Tax Law and other changes. However, the final receipts forecast must include the impact of these factors. Consequently, in a final step, the base forecast is converted back into a cash forecast by accounting for Tax Law and administrative changes, audits, court decisions, tax cuts being phased in, and prior period adjustments.

Cash Receipts

PERCENTAGE DISTRIBUTION OF CASH RECEIPTS (GF and LGAC)				
	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
2001-02	24.7	23.5	26.7	25.1
2002-03	23.9	26.6	24.8	24.7
2003-04	22.7	26.3	26.4	24.5
2004-05	25.6	25.3	25.2	23.9
2005-06	25.5	25.5	24.5	24.5
2006-07	24.8	25.6	25.9	23.8
2007-08	25.2	25.3	25.2	24.2
2008-09	25.7	26.7	24.3	23.2
2009-10	24.7	25.6	25.3	24.5
2010-11 (est.)	24.1	24.9	26.0	25.0

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

TAX BASE AND RATE

The New York State cigarette excise tax is imposed by Article 20 of the Tax Law on the sale or use of cigarettes within the State. The current tax rate is $4.35 per package of 20 cigarettes. The State also imposes a tax on other tobacco products, such as chewing tobacco, cigars, pipe tobacco and roll-your-own cigarette tobacco, at a rate of 75 percent of their wholesale price. Dry and moist snuff products are taxed at a rate of $2.00 per ounce. See "STATUTORY CHANGES" below for a history of tax rates.

The Federal government imposes a cigarette excise tax on manufacturers and first importers of cigarettes. The Federal tax rate, currently $1.01 per pack, was increased 24 cents to 34 cents per pack on January 1, 2000, to 39 cents per pack on January 1, 2002, and to $1.01 per pack on April 1, 2009. New York City also levies a separate cigarette excise tax, which increased from 8 cents to $1.50 per pack on July 2, 2002. New York City pays 46 percent of their cigarette tax to the State to support HCRA. 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, who are mostly wholesalers, pay the excise tax through the purchase of tax stamps from the State and affix the stamps to cigarette packages to be sold by New York State registered retailers. Out-of-State wholesalers may purchase cigarettes from a New York stamping agent without a State or joint City/State stamp affixed. New York residents who purchase non-stamped cigarettes must remit the cigarette excise tax directly to the Department of Taxation and Finance. An individual may bring two cartons into the State without being subject to the excise tax.

DATA SOURCES

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

- AM043, Department of Taxation and Finance Monthly Report of Receipts. This report contains gross and net receipts data.

- 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 now 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.

- Campaign for Tobacco Free Kids. Various reports prepared by the Campaign for Tobacco Free Kids available on their web site.

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 1983, 1989, 1990, 1993, 2000, 2002 and 2008 before slowing in the subsequent months. Total tax-paid cigarette consumption in New York has declined significantly since the mid-1980s. 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, lower tax rates in surrounding states, and bootlegging. Taxed consumption has also been affected by events including New York City and Federal cigarette tax increases, substantial enforcement efforts and the Tobacco Settlement.

Major recent events affecting overall taxable consumption include:

- Increase in the State cigarette tax from $2.75 per pack to $4.35 per pack, effective July 1, 2010.

- Increase in the Federal cigarette tax from 39 cents per pack to $1.01 per pack, effective April 1, 2009.

- Increase in the State cigarette tax from $1.50 per pack to $2.75 per pack, effective June 3, 2008.

- 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.

- Impact of price increases due to the cost of the Master Tobacco Settlement Agreement on the industry.

- Changes in tax rates in surrounding states.

- State enforcement program enacted in 1997-98.

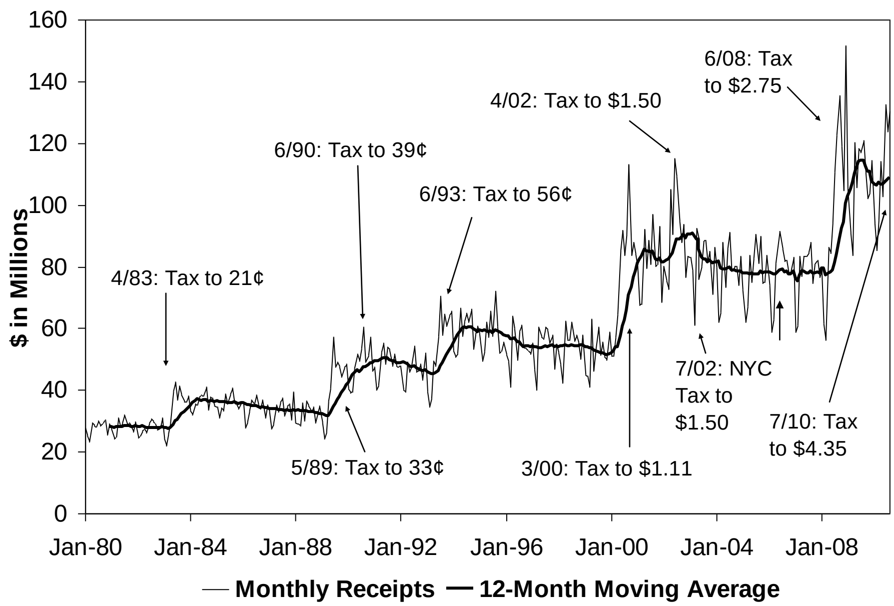
Statutory changes impacting the tobacco products tax include:

- Increase in the tobacco products tax from 46 percent of the wholesale price to 75 percent of the wholesale price and increase in the tax on snuff products from 96 cents to $2.00 per ounce, effective August 1, 2010.

- Increase in the tobacco products tax from 37 percent of the wholesale price to 46 percent of the wholesale price, effective April 7, 2009.

- Change in the method of tax of snuff products from a percent of wholesale price to 96 cents per ounce, effective July 1, 2008.

Cigarette Tax Monthly Receipts



STATE, FEDERAL AND NEW YORK CITY CIGARETTE EXCISE TAX RATES PER PACK OF 20 CIGARETTES (since 1950)					
State		Federal		New York City	
	Rate (cents)		Rate (cents)		Rate (cents)
Before April 1, 1959	2	Before November 1, 1951	7	Before May 1, 1959	1
January 1, 1948	3	November 1, 1951	8	May 1, 1959	2
April 1, 1959	5	January 1, 1983	16	June 1, 1963	4
April 1, 1965	10	January 1, 1991	20	January 1, 1976	8
June 1, 1968	12	January 1, 1993	24	July 2, 2002	150
February 1, 1972	15	January 1, 2000	34		
April 1, 1983	21	January 1, 2002	39		
May 1, 1989	33	April 1, 2009	101		
June 1, 1990	39				
June 1, 1993	56				
March 1, 2000	111				
April 3, 2002	150				
June 3, 2008	275				
July 1, 2010	435				

FORECAST METHODOLOGY

Econometric Model

TAXABLE CIGARETTE CONSUMPTION

$$\text{Log(Per Capita Consumption)}_t = \underset{(.353)}{7.50} - \underset{(0.003)}{0.023} * \text{Time Trend}_t - \underset{(0.077)}{.60} * \text{Log(Real Price of Cigarettes)} + u_t$$

Adjusted R Squared	0.9929
Root Mean Squared Error	0.041
Number of Observations	36

Note: Values in parentheses under coefficients represent standard errors

The Division of the Budget has developed an annual 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 purchases of taxed cigarettes in New York. The price variable is the average annual price, including tax, of cigarettes in New York[1]. 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. All variables except the time trend are in logarithmic form. An exogenous variable measuring the price of cigarettes in New York relative to surrounding states was attempted, but the results were less satisfactory. Specifically, the added variable was insignificant when used with the real NY cigarette price, and the fit was inferior when used alone. As an alternative to autocorrelation correction, a lagged dependent variable was added, but the results were inferior to the estimation method reported above.

The estimated price elasticity of the per capita consumption of cigarettes in New York is -0.6 percent. This estimate is slightly out of the range of -0.3 percent to -0.5 percent typically noted in the economics literature[2]. The trend decline in cigarette consumption, holding prices constant, is estimated at -2.3 percent per year.

[1] As reported in The Tax Burden on Tobacco, Orzechowski and Walker, Volume 43, 2008.
[2] 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.

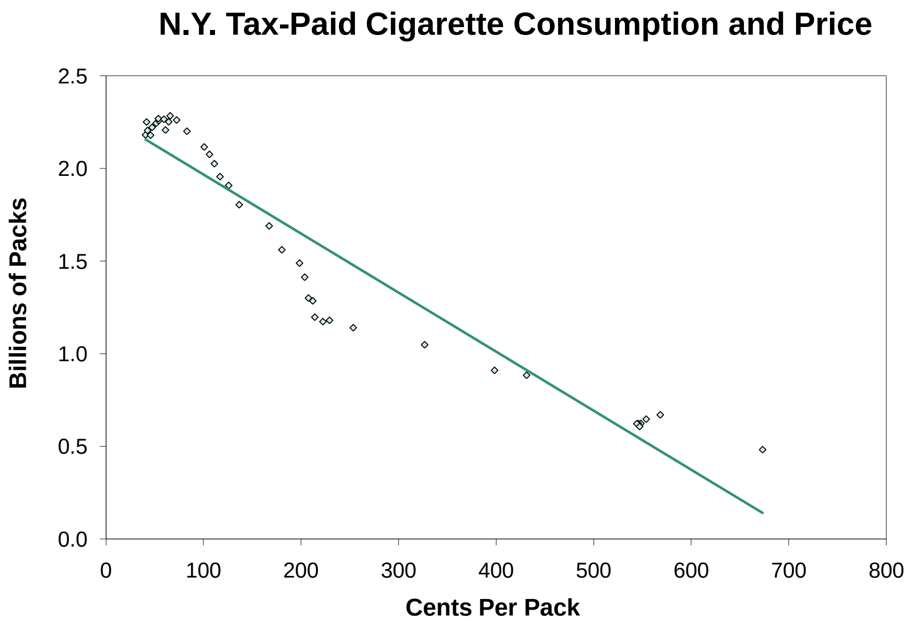
To produce an updated cigarette tax forecast, the equation's results are supplemented with the estimated impact on cigarette tax revenues of discrete events, such as large price increases by manufacturers, Federal and State cigarette excise tax increases and enforcement efforts.

To illustrate, consider tax receipts for State fiscal year 2000-01. In addition to the expectation of continuing declines in consumption from manufacturers' price increases and the growing aversion to smoking for health reasons, receipts in 2000-01 were affected by the near doubling of the State excise tax on March 1, 2000. Such a large effective price increase had a negative impact on cigarette consumption beyond the typical price effect noted above. Since 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. Evasion 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, but it does not apply to the U.S. Postal Service. Receipts in 2000-01 were also affected 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, since this tax increase was nationwide, and therefore did not exacerbate price differentials between New York and surrounding states or Native American reservations that may be exploited by illegal activities or legal avoidance.

CIGARETTE TAX RATES
CHANGES IN NEW YORK AND BORDERING STATES*
As of July 1
(cents per pack)

	2005	2006	2007	2008	2009	2010
Connecticut	151	151	200	200	200	300
Massachusetts	151	151	151	251	251	251
New Jersey	240	240	257.5	257.5	270	270
New York	150	150	150	275	275	435
Pennsylvania	135	135	135	135	135	160
Vermont	119	179	179	199	224	224

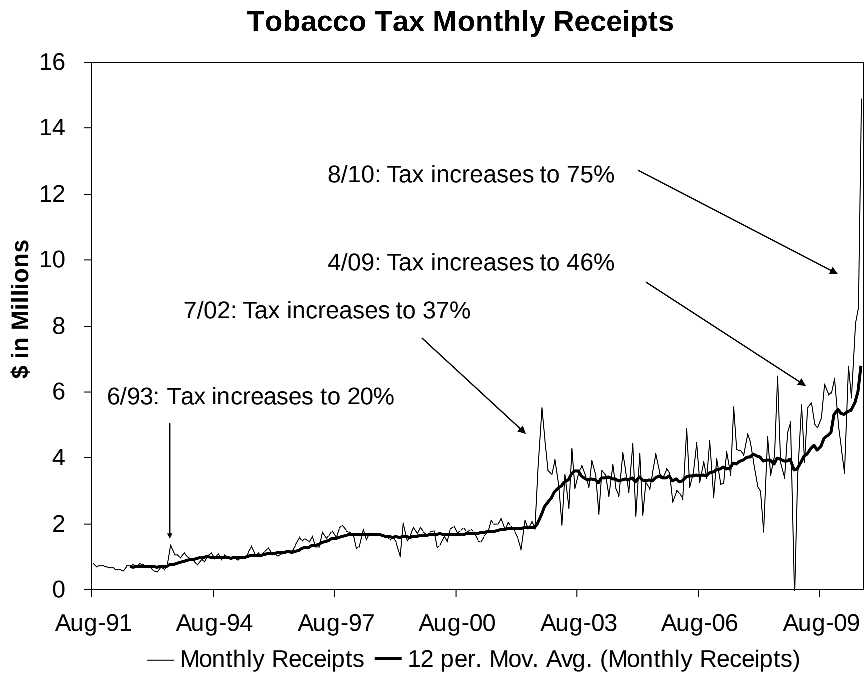
* As reported by The Campaign for Tobacco–Free Kids



*Data represent 1970-2009
Source:The Tax Burden on Tobacco, Orzechowski and Walker, Volume 44, 2009

Tobacco Products Tax Forecast Methodology

Tobacco products tax receipts are a small component of cigarette and tobacco taxes. In 2009-10, tobacco tax receipts of $63.6 million accounted for only 4.7 percent of total cigarette and tobacco tax collections. This tax is imposed on products such as cigars, pipe tobacco and chewing tobacco. The Division of the Budget uses trend analysis to construct a tobacco products tax forecast. The following graph shows monthly and 12-month moving average tobacco tax collections from August 1991 to August 2010.



Cash Collections

Excluding the periods immediately following tax increases, cash collections tend to be higher during the summer and lower during the 4th quarter.

PERCENTAGE DISTRIBUTION OF CASH RECEIPTS				
	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
2001-02	26.3	26.1	24.6	23.0
2002-03	28.4	27.2	23.7	20.7
2003-04	26.8	26.6	25.0	21.6
2004-05	26.4	26.6	25.5	21.5
2005-06	25.8	28.1	25.0	21.0
2006-07	26.5	26.4	25.3	21.7
2007-08	26.4	26.7	25.9	21.0
2008-09	20.7	28.6	28.8	21.9
2009-10	25.7	26.7	27.0	20.6
2010-11 (est.)	22.3	28.0	24.4	23.3

Risks to the Forecast

Several factors impart a substantial amount of uncertainty to the cigarette tax forecast. First, the effectiveness of enforcement programs in preventing evasion of the cigarette tax could have a significant impact on collections. Currently, millions of packs of cigarettes are sold to New York residents in a manner that has allowed them to evade the State's excise tax. Successful efforts to cut the supply of untaxed cigarettes should increase the number of taxed packs sold in New York.

Increases in the price of cigarettes, primarily from tax increases, have had a significant impact on taxable consumption. Recent changes in price may lead to greater reductions over time. In addition, future price changes may have greater or lower impacts than historical trends.

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, agricultural machinery, commercial vessels, or vehicles operated on rails or tracks, are granted refunds of the tax. Thus, the tax is levied primarily on fuel used in motor vehicles operating on the public highways of the State or fuel used in recreational boats on the State's waterways.

Administration

The gasoline component of the motor fuel tax is 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) or by certified check 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:

- AM043, Department of Taxation and Finance Monthly Report of Receipts. This report contains gross and net receipts data.

- 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. These are 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 motor fuel tax on diesel was reduced from 10 cents to 8 cents per gallon, effective January 1, 1996. In addition, there is an exemption or partial exemption of motor fuel tax for certain alternative fuels. This will sunset on September 1, 2011.

FORECAST METHODOLOGY

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 for gasoline and quarterly for diesel, 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

The following methodologies are used to derive the gallons of motor fuel demanded.

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. It estimates 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 0.56 percent. To derive a State level forecast, real New York disposable personal income is substituted for GDP. The following table lists percentage changes of real New York disposable personal income and gasoline price.

PERCENT CHANGE IN EXOGENOUS VARIABLES

	Real NY Disposable Income	NY Gasoline Price
2001-02	(1.0)	(4.0)
2002-03	2.1	2.6
2003-04	1.8	7.8
2004-05	2.6	19.3
2005-06	1.5	21.7
2006-07	3.9	8.6
2007-08	3.0	13.2
2008-09	(1.0)	0.2
2009-10	2.5	(13.5)
2010-11 (est.)	2.0	8.5

Diesel

Consumption of diesel fuel is forecasted with a simple econometric model relating consumption to real GDP. The model was most recently estimated with 142 observations of quarterly data (1975:1 to 2010:2). A dummy variable is used to isolate the impact of changes in tax remittance in State fiscal year 1988-89. A quarterly dummy variable for the first calendar quarter 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 and tax law and administrative changes.

Cash Receipts

Gasoline motor fuel tax receipts display wide variation in monthly cash receipts, but the long-term trend has remained fairly stable since the mid-1980's, generally falling in the range of $35 million to $40 million per month. There is only a small seasonal pattern relative to total collections.

Diesel motor fuel receipts have also remained fairly stable, usually falling between $4 million and $6 million per month since 1988. However, as expected, the trend for diesel collections appears more sensitive to economic cycles. There have been reporting anomalies associated with classifying receipts of motor fuel tax and petroleum business tax.

PERCENTAGE DISTRIBUTION OF CASH RECEIPTS				
	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
2001-02	27.2	30.0	27.0	15.8
2002-03	27.5	26.6	22.8	23.1
2003-04	23.1	25.3	26.2	25.4
2004-05	24.9	27.4	25.1	22.6
2005-06	24.8	26.6	25.1	23.5
2006-07	25.1	26.5	24.9	23.5
2007-08	24.0	25.9	25.2	24.9
2008-09	23.9	26.8	25.3	24.0
2009-10	24.9	25.6	25.4	24.1
2010-11 (est.)	23.6	27.5	25.0	23.9

Risks to the Forecast

Due to the difficulty in predicting fuel prices, gasoline inventories, tax evasion and weather conditions, the revenue estimate has certain risks. Global economic and political conditions as well as market forces affect fuel prices. For example, the average quarterly retail price of gasoline increased by 22.3 percent from July 2009 to July 2010. In addition, year over year changes in the average quarterly price of the West Texas Intermediate crude oil have ranged from 6.1 percent to 90.8 percent since the first quarter of 2008.

ALCOHOLIC BEVERAGE TAXES

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. 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. Licensed distributors and non-commercial importers of such beverages remit these taxes in the month following delivery.

CURRENT STATE TAX RATES (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
Naturally sparkling wine	0.30 per gallon
Artificially carbonated sparkling wine	0.30 per gallon
Still wine	0.30 per gallon
Beer with 0.5 percent or more alcohol	0.14 per gallon
Cider with more than 3.2 percent alcohol	0.01 per liter

DATA SOURCES

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

- AM043, Department of Taxation and Finance Monthly Report of Receipts. This report contains gross and net receipts data.

- Alcoholic Beverage Tax Monthly Statistical Report, Department of Taxation and Finance. This report contains alcoholic beverage monthly consumption data.

STATUTORY CHANGES

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 naturally 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. Effective May 1, 2009, the beer tax was increased to 14 cents per gallon and the wine tax was increased to 30 cents per gallon.

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. These provisions were made permanent in 2008.

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

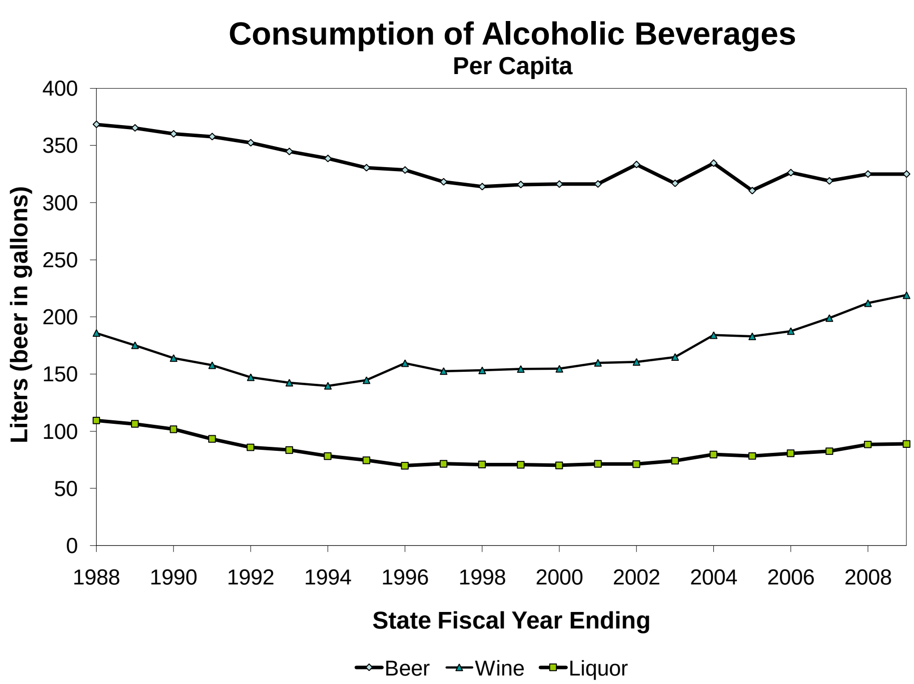
New York alcohol consumption generally follows national trends. The chart below compares U.S. (using data from National Institute of Health) and New York per capita consumption data. Consumption changes have a major effect on changes in excise tax receipts.

Alcohol Consumption Per Capita (All Beverages) (Gallons of Ethanol)

	1995	2000	2005	2007
NYS	1.93	1.88	1.97	2.06
Northeast Region	2.09	2.10	2.20	2.28
US	2.15	2.18	2.23	2.31

Source: National Institute of Health
Population age 14 and older

The forecast for this tax source is primarily based on an analysis of historical alcoholic beverage consumption trends.



Occasionally, ABT receipts are understated or overstated due to misallocation of tax receipts to New York City. For instance, 1998-99 State receipts were overstated by $1.8 million. In such cases, an adjustment to the data is incorporated into the forecast.

Three time series models have been developed for the per capita consumption of beer, liquor and wine. These models put more weight on recent observations to reflect shifts in recent trends. The actual annual per capita consumption data covers the period from fiscal year 1970-71 through fiscal year 2008-09. The level smoothing weight and the trend smoothing weight in the models are selected to minimize 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 is reported as follows:

Statistics	Beer: Damped Trend Exponential Smoothing	Liquor: Damped Trend Exponential Smoothing	Wine: Damped Trend Exponential Smoothing
Level Smoothing Weight	0.5678	0.6157	0.8413
Trend Smoothing Weight	0.9990	0.6941	0.9990
Adjusted R-Square	0.9451	0.9930	0.8760

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, the following price elasticities derived from the noted sources are used: 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.

- Tax Policy Changes: Recently enacted and proposed tax rate changes may have a significant impact on receipts.

- Enforcement: The State continues to suffer tax evasion through the bootlegging of liquor from other states. Legislation enacted in 2008 made enforcement provisions permanent. ABT receipts in 2007-08 are estimated to have increased by $3 million due to enforcement efforts.

Cash Receipts

The collections pattern for this tax has remained fairly constant, aside from the tax increases in the early 1990s. The seasonal pattern suggests increased consumption of taxable beverages in November and December.

PERCENTAGE DISTRIBUTION OF CASH RECEIPTS				
	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
2001-02	24.6	26.6	25.7	23.1
2002-03	25.8	26.6	25.1	22.5
2003-04	25.4	26.3	24.4	23.9
2004-05	24.1	25.6	25.8	24.5
2005-06	24.7	26.8	24.1	24.4
2006-07	25.0	26.7	25.6	22.7
2007-08	25.7	26.5	25.5	22.3
2008-09	25.7	26.6	24.4	23.3
2009-10	23.8	27.1	25.2	23.9
2010-11 (est.)	25.0	26.3	25.4	23.3

Risks to Forecast

The forecast is based on time series models that are subject to error, especially due to the possible omission of exogenous factors that may influence collections. The depletion or replenishment of inventories can also have a significant impact on the amount of taxable gallons.

HIGHWAY USE TAX

BACKGROUND

Tax Base and Rate

A highway use tax is imposed 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 a highway use registration system. 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.

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 on the amount of fuel purchased within the State, the fuel use tax is imposed on fuel purchased out-of-State 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 for the sales tax component is equal to the State rate of 8 cents per gallon for motor fuel and diesel motor fuel plus the lowest county sales tax rate. A credit or refund is allowed for motor fuel tax or sales tax paid on fuels purchased but not used within the State.

The current registration system is based on the license plate number of each vehicle. The Commissioner of the Department of Taxation and Finance, "the Commissioner", could deny registration if the carrier has not paid monies due from any other tax and there is a civil penalty for any person who fails to obtain a certificate of registration when it is required. In addition, the Commissioner is authorized to mail out decals to TMT carriers.

Administration

Most taxpayers remit the TMT on a monthly basis. The tax is remitted on or before the last day of each month for the preceding month's liability. Fuel use taxpayers file quarterly with their home state under the rules of the International Fuel Use Tax Agreement (IFTA). The home state subsequently distributes the funds to the state where the liability occurred. The highway use certificate of registration is usually issued and renewed every three years.

DATA SOURCES

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

- AM043, Department of Taxation and Finance Monthly Report of Receipts. This report contains gross and net receipts data.

- 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 suppressed 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.

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.

Legislation in 2006 capped the State sales tax component at 8 cents per gallon for motor fuel and diesel motor fuel. Localities have three options; cap the tax base at $2 or $3 per gallon or keep the status quo. In addition, alternative fuels are now partially or fully exempt from the fuel use tax.

Highway Use Registration System

Legislation in 2007 replaced the highway use permit system with a registration system. This change conformed the State's highway use tax with Federal law (This Federal law was later repealed on September 6th, 2008, in a technical corrections bill).

Legislation in 2009 increased the application fee for a certificate of registration for any trailer, semi-trailer, dolly, or other attached device used for transporting automotive fuel from $5 to $15. The renewal fee for any truck, tractor, or other self propelled vehicle was increased from $4 to $15, and the renewal fee for any trailer, semi-trailer, dolly, or other attached device used for transporting automotive fuel was increased from $2 to $15. Based on these amendments, the initial cost and the renewal fee for a certificate of registration are now all $15.

FORECAST METHODOLOGY

In formulating its estimates and projections, the Division of the Budget relies principally upon the relationship of U.S. employment and real U.S. imports to TMT receipts. A quarterly regression model with variables expressed in the fourth difference of the natural log is used to estimate TMT revenues. Coefficients are then interpreted as the expected quarterly growth rate.

TMT data are actual quarterly tax collections from the Department of Taxation and Finance, adjusted for tax policy changes and irregular audit receipts. The variables used in the model are U.S. employment and real U.S. imports. The U.S. employment variable illustrates the overall strength of the economy while the real imports variable captures the amount of goods being delivered on the trucks.

Four dummy variables are set for: (1) the 1990 Tax Law change that applied the TMT rate to Thruway miles, which was eliminated in 1996, (dThruway); (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, (dTMT); and (3) a quarterly dummy variable, which reflects seasonal patterns for the first calendar quarter, (dQ1) (4) a dummy variable for the enactment of the motor fuel and diesel motor fuel gas cap (D2006).

TRUCK MILEAGE TAX EQUATION

$$\underset{}{\Delta_4 \ln TMT_t} = \underset{(0.260)}{0.924}\,\Delta_4 \ln EMPUS_t + \underset{(0.070)}{0.202}\,\Delta_4 \ln RIMPORTS_t + \underset{(0.043)}{0.145}\,\Delta_4 \ln TMT_{t-1}$$

$$+ \underset{(0.024)}{0.168}\,DTHRUWAY_t + \underset{(0.032)}{0.413}\,DTMT_t - \underset{(0.052)}{0.118}\,DQ1_t - \underset{(0.036)}{0.029}\,D2006_t$$

$Adjusted\ R^2 = 0.84$

$RMSE = 0.051$

Number of Observations = 153

Note: Values in parentheses under coefficients represent standard errors.

Fuel use tax collections fluctuate with fuel consumption, especially diesel fuel, which is influenced by both economic conditions and fuel prices. The diesel fuel model, which is detailed in the Petroleum Business Taxes section, is used as a proxy for fuel use tax collections. The fuel use tax is also affected by fuel prices since this can dictate if a driver purchases fuel in-State or out-of-State. When drivers purchase fuel out-of-State, but use it in-State, fuel use tax collections increase while motor fuel tax collections and sales tax collections on motor fuel both decline.

CASH RECEIPTS

The table below illustrates collections on a quarterly basis.

PERCENTAGE DISTRIBUTION OF CASH RECEIPTS

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
2001-02	26.9	26.1	25.1	21.9
2002-03	24.0	25.8	27.0	23.2
2003-04	25.7	26.5	25.4	22.4
2004-05	25.4	25.5	26.0	23.1
2005-06	24.6	23.7	27.3	24.4
2006-07	25.5	26.9	25.4	22.2
2007-08	25.1	25.8	26.2	22.9
2008-09	26.4	26.3	26.2	21.1
2009-10	25.0	27.8	25.3	21.9
2010-11 (est.)	24.9	24.6	26.1	24.4

BANK TAX

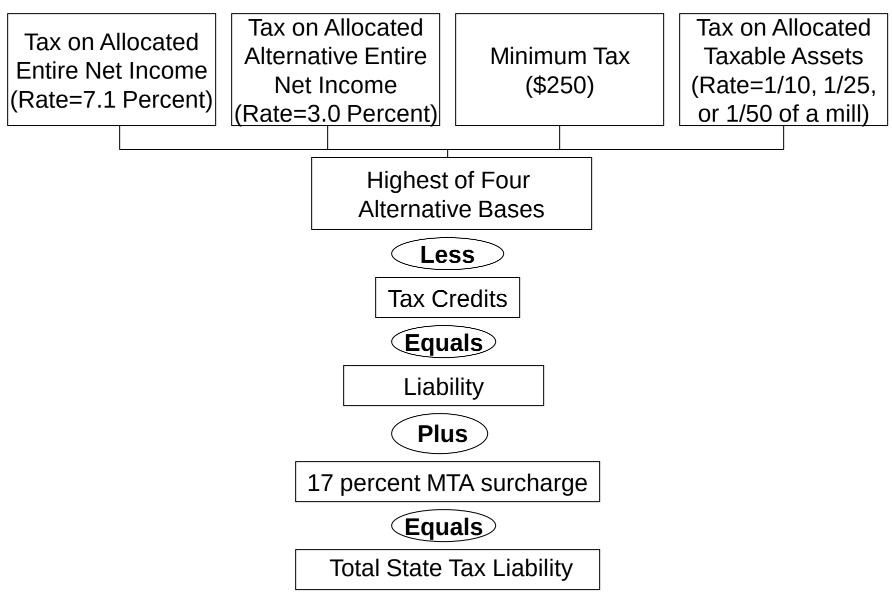
BACKGROUND

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 bank tax has four separate bases: allocated entire net income (ENI) at 7.1 percent, allocated alternative minimum taxable income (AMT) at 3.0 percent, allocated taxable assets at rates dependent on the composition of assets, and a fixed minimum tax of $250.

In addition to the liability resulting from the highest of the four alternative base calculations, taxpayers doing business in the Metropolitan Commuter Transportation District (MCTD) are subject to a 17 percent surcharge on the portion of total tax liability allocable to the MCTD. Collections resulting from this surcharge are deposited to the Mass Transportation Operating Assistance Fund (MTOAF) to support the Metropolitan Transportation Authority (MTA).

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:

- AC015, 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. The most recent report is for tax year 2006.

- 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. The most recent tax year reflected in the Study File is 2007.

- 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.

STATUTORY CHANGES

Major changes were made to the tax in 1985 that were intended to simplify compliance and ease administration of the tax. Following Federal changes to the Internal Revenue Code in 1986, the State tax was significantly altered again in 1987 to conform to or decouple from each of the several Federal changes. Major portions of the 1985 and 1987 changes were scheduled to expire, but have been extended numerous times since their original enactment.

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. Legislation enacted during the 2010 Legislative Session (chapter 24 of the Laws of 2010) extended the State GLBA transitional provisions through tax year 2011 for certain taxpayers.

The 2007-08 Enacted Budget addressed the use of closely-held Real Estate Investment Trusts (REITs) and Regulated Investment Companies (RICs) for tax-planning by certain taxpayers. The 2008-09 Enacted Budget made technical and substantive changes to the closely-held REIT and RIC provisions. The 2010-11 Enacted Budget made these changes permanent. These changes were scheduled to sunset December 31, 2010.

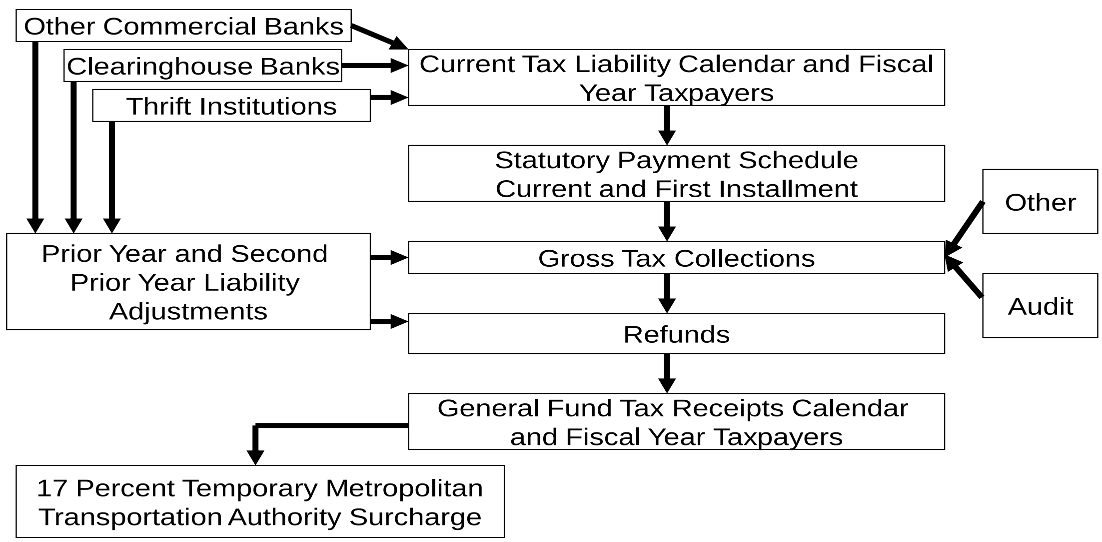
For a detailed list of significant statutory changes made to the bank tax, please see the New York State Executive Budget - Economic and Revenue Outlook.

FORECAST METHODOLOGY

Current and outyear estimates are based on a blend of historical collection patterns, simple trending techniques, estimates of underlying company liability, a microsimulation model for estimating the entire net income and asset base in the outyears, and statutory changes or other occurrences that may affect collections.

The following flowchart highlights the components of State fiscal year bank tax collections as reported by the New York State Department of Taxation and Finance.

Components of the Bank Tax



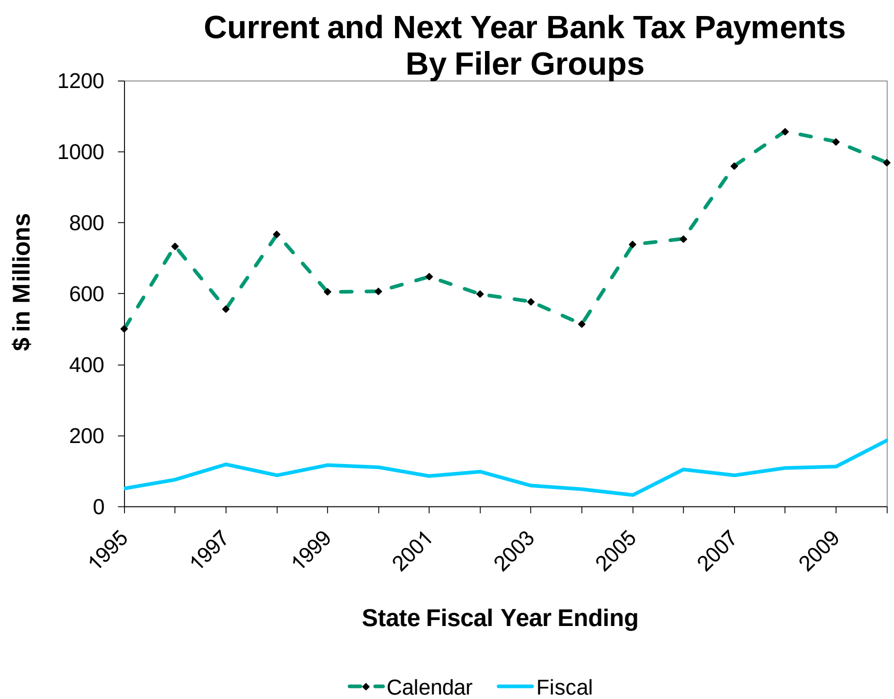
The forecast for bank tax collections is driven by taxpayers' payments on estimated liability. As a result, the forecast methodology begins by constructing a historical liability series for each type of taxpayer. The forecast breaks collections into groups by taxpayer type: commercial banks, savings institutions, and savings and loan institutions. Starting in State fiscal year 2005-06, the two savings categories were reclassified as one group, since they had diminished as a share of the tax base. Commercial banks were divided into clearinghouse banks and other commercial banks. Taxpayers are further classified as either calendar year or fiscal year taxpayers, based on their Federal tax return.

In any given year, taxpayers make adjustments to estimated payments from prior periods. These adjustments are either credit carry forwards (i.e., the taxpayer applies a potential refund to an estimated payment liability), 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 place downward pressure on State fiscal year cash collections. The following table highlights the fiscal periods in which different categories of banks are making payments during a given State fiscal year.

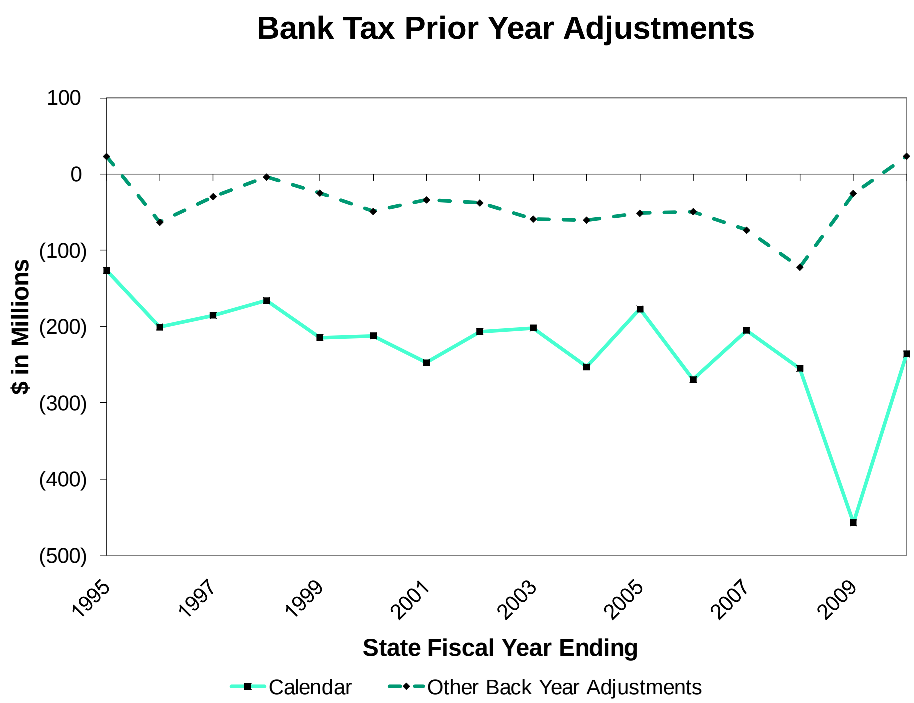
STATE FISCAL YEAR 2009-2010 NET COLLECTIONS BY FISCAL PERIOD (millions of dollars)	Savings	Clearinghouse	Other Commercial	Total
Prior Fiscal Year	(1.7)	(1.5)	(27.2)	(30.4)
Current Fiscal Year	(0.3)	0.0	97.9	97.6
Next Fiscal Year (1st Installment)	0.9	0.0	89.1	90.0
Second Prior Calendar Year	3.2	0.6	(3.2)	0.6
First Prior Calendar Year	(7.5)	(9.6)	(234.1)	(251.2)
Current Calendar Year	19.2	3.3	657.0	679.5
Next Year Calendar (1st Installment)	8.7	0.4	282.0	291.1
Other Collections	0.6	0.0	(0.6)	0.0
Other Prior Years	1.8	3.5	48.5	53.8
Audit and Compliance Receipts	4.0	0.0	238.5	242.5
Total Net Collections	**28.9**	**(3.3)**	**1,147.9**	**1,173.5**

The table illustrates that calendar-year commercial bank payments have the greatest influence on State fiscal year net collections. The 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 conditions of the banking industry and resulting cash payments.

The following graphs illustrate the interplay between estimated payments on current year liability and adjustments to prior years' liabilities, resulting in net receipts collected during the State fiscal year. Taxpayers' payments on current and next year liability appear somewhat volatile (first graph), but noticeably demonstrates a decline during the brief recession following the events of September 11, 2001. Through fiscal year 2007-08, current and next year payments increased as general economic and business conditions improved. State fiscal year 2008-09 and 2009-10 payments declined with banking profitability.



The graph below shows that, on the whole, prior year adjustments have had a negative impact on net receipts over the last several fiscal years as banks reported significant losses due to the financial crisis. When bank profitability is relatively stable or growing, prior year adjustments are also less volatile.



Outyear Forecast

The outyear estimation process involves several steps:

1. Deriving annual growth rates for the entire net income base and the asset base (the two largest tax bases);
2. Using the growth rates above to trend tax year liability in a micro-simulation model based on the actual calculation of tax employed in each tax year. The base year is the tax year for which the most recent study file of returns is available (2007);
3. Comparing simulated liability from past years to payments on liability for the same past tax year to adjust results where appropriate;
4. Making additional adjustments for the estimated impact of Tax Law changes and any administrative actions;
5. Converting adjusted current year payment estimates to a State Fiscal Year cash estimate using historical relationships between current year payments and other payments (pre-payments, prior year adjustments, etc.); and
6. Adding estimates for audit and compliance receipts recovered by the Department of Taxation and Finance.

Deriving Component Annual Growth Rates

The aggregate entire net income (ENI) base is trended from the most recently available study file, currently 2006, using U.S. before-tax corporate profits. While there is no single economic variable that mirrors the complexity of the tax code for corporations, corporate profits often serve as a proxy for taxable income under the ENI base. Industry profit forecasts (Value Line, FDIC etc.) and financial statements of banks are also examined to monitor trends specifically impacting the banking industry.

Cash and loans represent a significant portion of a bank's assets based on data from the Federal Deposit Insurance Corporation (FDIC). Using correlation analysis, the value of mortgages outstanding was highly correlated to the taxable assets for New York banks using data from the study files. Therefore, the value of mortgages outstanding is used to trend the asset base for the outyear forecast.

Compound Growth Rates

Tax Year	Value of Mortgages Outstanding	Pre-Tax Corporate Profits
2008	1.0361	0.7669
2009	1.0229	0.7574
2010	0.9876	1.0307
2011	0.9779	1.0626
2012	1.0121	1.1095
2013	1.0838	1.1740
2014	1.1805	1.2429
2015	1.2952	1.3058

Micro-Simulation Model

The growth rates generated are then entered into a simulation model that calculates liability for taxpayers included in the most recent study file, which currently reports information from bank tax returns for the 2007 tax year. Liability is simulated from a 2007 base for years that have already occurred (i.e. 2008 and 2009). Model results are adjusted by comparing them to publicly available industry estimates and to known cash results for those years.

Cash Receipts

Bank tax collections have historically been extremely volatile due to the growing share of total bank tax receipts accounted for by audit and compliance collections. Since audit and compliance receipts often cover several liability years, it is difficult, if not impossible, to attribute cash receipts from this source to any particular liability year for purposes of historical or trend analysis. This volatility often results in significant differences between the model-driven estimates and net receipts. Audit and compliance estimates are based upon discussions with the Department of Taxation and Finance and an examination of year-to-date results as compared to historical trends.

Based on statutory payment schedules, banking companies make quarterly payments on estimated liability in March, June, September, and December. Volatility of bank tax receipts began to increase in 1986 when a substantial number of bank tax changes took effect. This increased volatility makes it difficult to establish links between underlying economic fundamentals and cash receipts. The following table illustrates the distribution of cash collections by quarter during the State fiscal year. Again, the pattern is quite volatile.

PERCENTAGE DISTRIBUTION OF BANK TAX GENERAL FUND COLLECTIONS

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
2001-02	32.0	17.8	25.1	25.1
2002-03	30.2	25.2	15.7	28.9
2003-04	39.8	22.1	27.0	11.1
2004-05	25.8	28.5	17.1	28.6
2005-06	27.9	15.4	24.6	32.2
2006-07	29.8	16.4	16.8	37.0
2007-08	33.0	30.2	13.6	23.2
2008-09	12.1	32.8	15.0	40.1
2009-10	31.1	13.5	24.0	31.4
2010-11 (est.)	16.2	28.7	22.7	32.4

The following table reports cash collections attributable to the first installment, three quarterly estimated payments, March final payment and adjustments made in subsequent years on a particular tax year's liability. For tax years starting January 1, 2003 through January 1, 2005, as well as for the tax year starting January 1, 2009 the first installment was calculated as 30 percent of the prior year's tax liability, rather than 25 percent. For tax years starting January 1, 2010 and after the pre-payment percentage is raised to 40 percent. The table shows that, as previously discussed, payments and adjustments to liability continue for several fiscal years. The total payments on a tax year's liability are shown in the far right column. However, the table does not attempt to show the net interaction of payments on liability from different tax years, which would represent net cash collections at a point in time.

CALENDAR YEAR COMMERCIAL BANK TAX PAYMENTS ON LIABILITY ($ MILLIONS)

Tax Year	March Pre-Payment	1st Qtr. Installment	2nd Qtr. Installment	3rd Qtr. Installment	March Final	Total 2nd Year Adj.	Total 3rd Year Adj.	Total Payments
2001	109.6	117.6	89.6	215.5	57.8	(148.6)	(49.8)	391.8
2002	118.9	116.3	130.0	147.9	7.9	(199.8)	(20.9)	300.3
2003	143.7	113.2	145.5	115.9	32.1	(154.6)	(24.0)	371.7
2004	98.7	147.4	196.6	159.7	69.0	(213.4)	(20.1)	438.1
2005	157.1	187.5	162.6	222.6	(25.7)	(158.2)	(5.9)	540.0
2006	137.6	158.1	207.3	229.3	136.8	(221.7)	(86.7)	560.7
2007	189.1	241.3	342.8	204.8	50.1	(353.2)	(2.6)	672.3
2008	182.0	144.9	316.7	197.6	83.1	(243.8)	n/a	n/a
2009	257.3	202.8	148.0	284.8	25.6	n/a	n/a	n/a
2010	282.4	152.3	301.8	n/a	n/a	n/a	n/a	n/a

The previous two tables demonstrate the relationship between taxpayers' cash payments and underlying liability. For example, State fiscal year 2010-11 current year estimated liability and the next year's first installment are computed from a forecast of the taxpayer's 2010 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.

Receipts from the MTA Surcharge are estimated in the current year using the same historical ratio analysis employed to estimate General Fund receipts with audit and compliance receipts estimated separately. For the outyears, estimates are arrived at by multiplying 1) the ratio of non-audit General Fund receipts to non-audit MTA Surcharge receipts and 2) the applicable outyear General Fund estimates. Again, audit and compliance receipts are separately estimated.

Risks to the Forecast

The bank tax forecast involves, in large part, managing uncertainties, as follows:

- The volatile relationships 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.

- Audit and compliance receipts. There is no reliable method for predicting this significant cash source, meaning adjustments to the bank tax forecast during the fiscal year are necessary for risk management purposes.

- The passage of the Dodd-Frank Wall Street Reform and Consumer Protection Act adds uncertainty to the bank tax forecast.

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

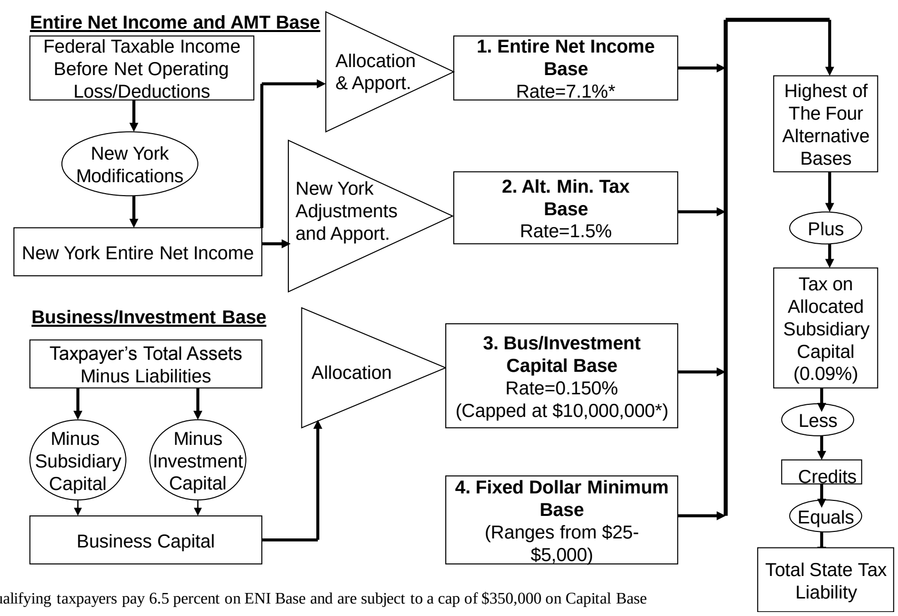
CORPORATION FRANCHISE TAX

BACKGROUND

Tax Base and Rate

The corporation franchise tax is composed of receipts derived from tax liabilities incurred under Articles 9-A and 13 of the Tax Law. Article 13 imposes a 9 percent tax on unrelated business income earned by generally tax-exempt organizations. Article 9-A of the Tax Law 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 on the base that results in the largest liability, 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 General Fund Tax Liability
(Current Law)



*Qualifying taxpayers pay 6.5 percent on ENI Base and are subject to a cap of $350,000 on Capital Base

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.

[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 New York State Division of the Budget and the New York State Department of Taxation and Finance and *Analysis of Article 9-A General Business Corporation Franchise Tax Credits* published by the New York State Department of Taxation and Finance.

- Deductions: net operating losses and fifty percent of dividends from non-subsidiary corporations.

- Credits: such as the investment tax credit (ITC) and employment incentive credit (EIC), Empire Zone credits, Brownfield credits and the Empire State Film Production credit.

DATA SOURCES

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

- AC015 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 most recent report is for tax year 2006.

- 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. This file is compiled by the Department of Taxation and Finance and includes all corporations filing under Article 9-A, except S corporations and certain 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 2006 tax year.

- Value Line Investment Survey. Relevant industry outlook issues.

- Securities and Exchange Commission (SEC) Website. This web site is monitored for relevant quarterly (10-Q) and annual (10-K) financial reports.

- Other Publications. Wall Street Journal, New York Times, Business Week, Barron's, and Crain's.

STATUTORY CHANGES

A number of Tax Law changes have had a substantial impact on Article 9-A collections. For a listing of these changes, see the New York State Executive Budget, Economic and Revenue Outlook.

FORECAST METHODOLOGY

Current year and outyear estimates are based on a blend of historical collection patterns, simple trending techniques, estimates of underlying company liability, an econometric model for the base sensitive to economic changes, and adjustments for the estimated impact of statutory changes or other occurrences that may affect collections.

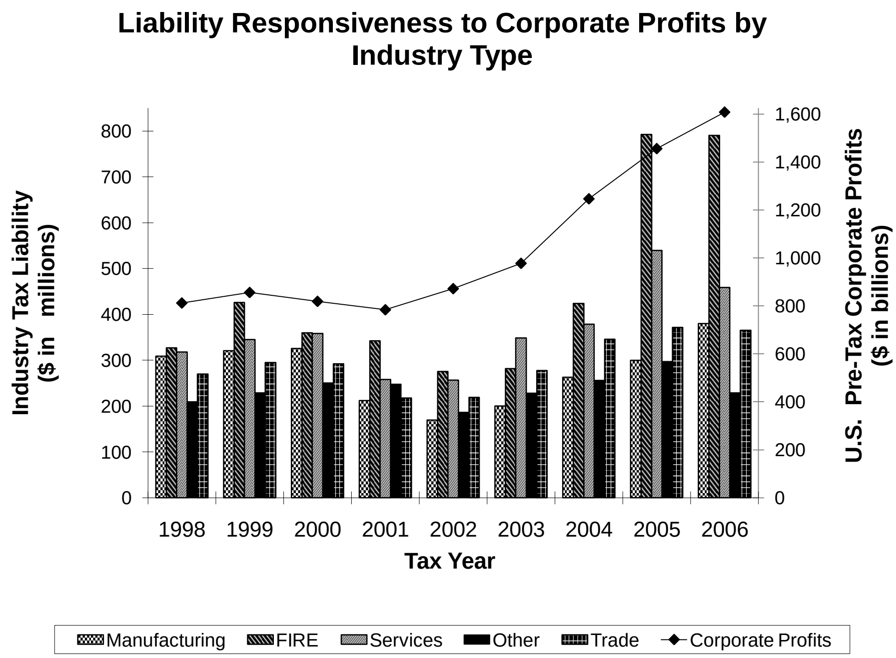
Projecting corporate tax receipts is difficult given the large number of factors that can determine tax liability in any year, especially since, as reported above, the taxpayer computes tax under four different bases.

In theory, estimating corporate franchise tax cash receipts involves considering how general business conditions affect tax liability from year to year. While there is no single economic variable that mirrors the complexity of the tax code for corporations, corporate profits often serve as a proxy for taxable income under the ENI base that accounts for the bulk of liability in any tax year. It is important to note that the Bureau of Economic Analysis (BEA) defines corporate profits as the net income of organizations treated as corporations in the National Income and Product Accounts (NIPA). By contrast, taxable profits, or ENI, are a function of the tax code, and the two measures of profits differ significantly. The Division of the Budget uses corporate profits based on the BEA definition to model and forecast corporate tax receipts.

Tax Liability

The estimation process is further complicated by the fact that the tax liabilities of different types of taxpayers do not exhibit a uniform relationship to any economic variable. The following chart illustrates the fluctuation in the tax liability of the major industry groups as compared to changes in corporate profits for the 1998 to 2006 period. Information on tax liability comes from the Article 9-A Corporation Franchise Tax Study File, with 2006 the latest year of available tax return data. While the tax liability of certain individual industries may appear to have a loose relationship to corporate profits for the time period shown, no strong positive relationship is apparent when examining industries in the aggregate. Since the mix of industries comprising the tax base clearly changes over time, extrapolating cash receipts is more difficult. Accounting for these factors is an important part of managing the large uncertainties associated with estimating corporate franchise tax liability.

Elements of the Tax Law, such as tax credits, can also distort relationships between aggregate corporate profits and tax liability. For example, the investment tax credit allows manufacturing taxpayers to lessen liability during upswings in the business cycle, and credits are stockpiled during periods in which profits decline since liability itself often decreases. Again, factors such as law changes and the impact of tax credits are accounted for separately in the estimating process.

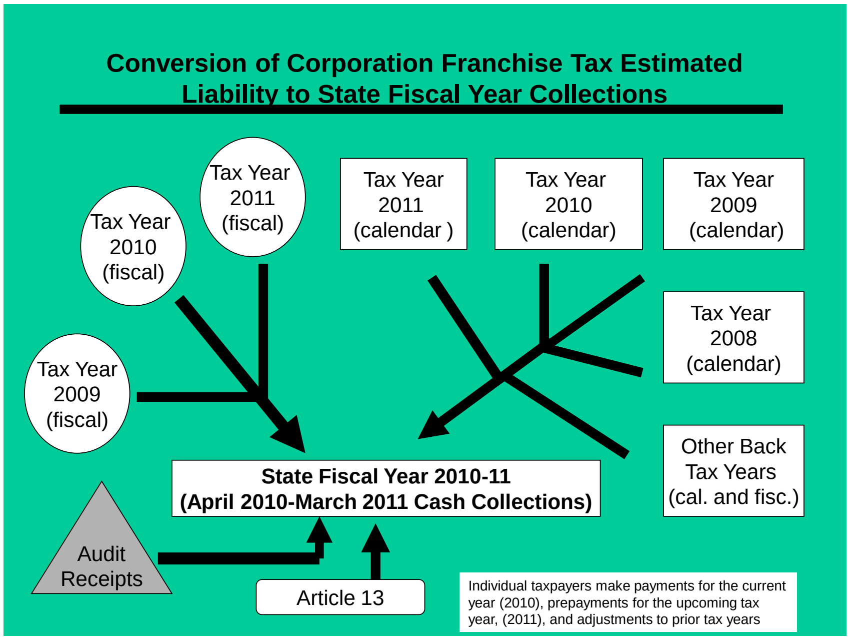


Cash Receipts

The cash estimation process involves attempting to allocate estimated liability to the State fiscal year in which it will be received. This is complicated by the corporation franchise tax payment system.

State fiscal year corporation franchise tax cash collections are the net result of payments on estimated current year liability, and adjustments to prior liability years as returns are filed on extension. Audit collections, which represent administrative adjustments to prior liability years, are forecast separately using historical trends and information from the Tax Department. Changes in the payment rules on estimated payments, as well as statutorily allowed extensions to file amended returns, have also impacted cash collection patterns.

Finally, not all corporate taxpayers have matching liability years. Calendar year taxpayers base both their internal accounting and their accounting for tax purposes on the standard twelve month calendar year. By contrast, taxpayers may also choose a twelve month period which differs from the calendar year for both internal and tax accounting purposes. For the purposes of the following chart, the payments and adjustments of these fiscal year taxpayers on various liability years are depicted by ovals. The chart details how payments on liability from different tax years ultimately result in State fiscal year cash collections.



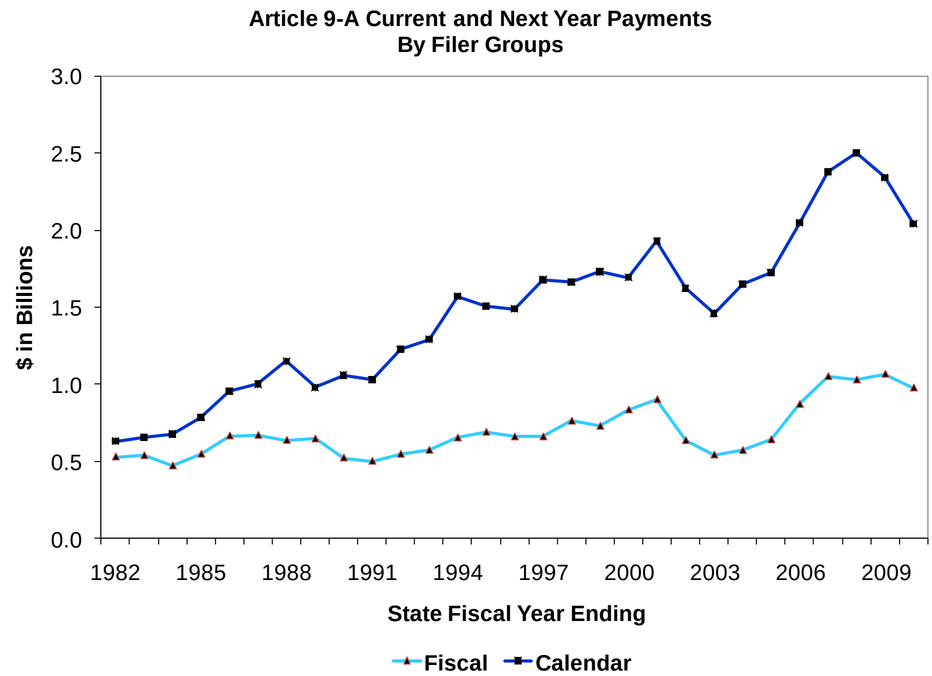
Current Year Forecast

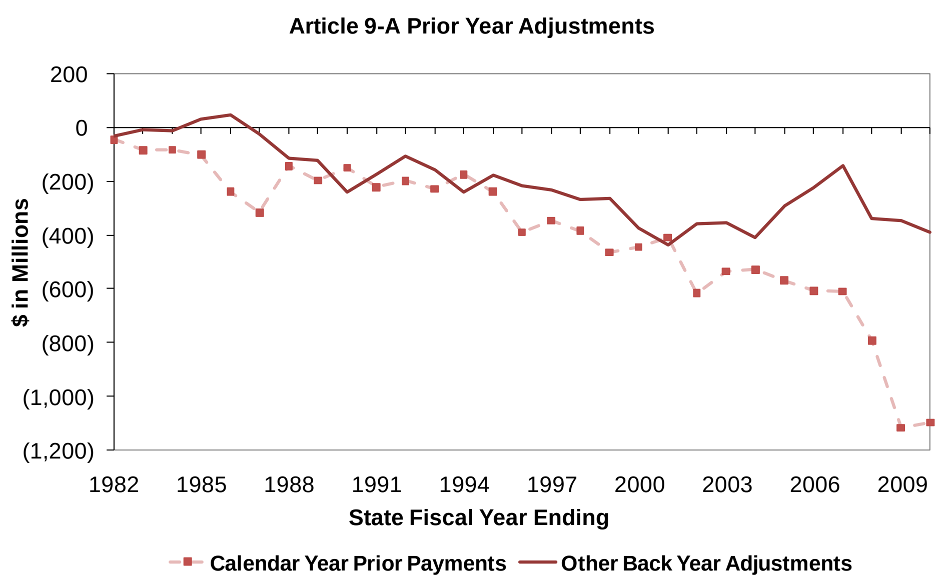
For the current year forecast, staff analyze trends in the components of cash collections. For example, year-to-date payments are compared to historical averages for the same portion of the fiscal year to estimate the remaining receipts for the year. By tracking each of the individual components that make up State fiscal year collections, we are able to apply historical trends to forecast the components which are then aggregated.

These historical trends are adjusted for abnormalities caused by administrative and Tax Law changes and economic shocks that may disrupt otherwise stable patterns observable over a number of years. Previous years exhibiting anomalous results may either be ignored entirely, or contrarily, extensive analysis may be performed in an attempt to uncover useful information that may continue to affect current results.

The current forecasting methodology tracks the seven liability payment streams and the other unassigned liability payments (other back year calendar and audits and compliance receipts) indicated in the figure above to arrive at estimates of current State fiscal year collections. Considerable attention has been given recently to the tracking and estimation of audit and compliance receipts. While nearly impossible to predict, survey information from the Department of Taxation and Finance allows continual adjustment of estimated audit and compliance receipts for the current year.

The following two graphs illustrate the major payment streams analyzed within a State fiscal year (2nd prior calendar payments and other back year payments have been combined). The first graph shows the relatively stable upward trend in payments on current year estimated tax from calendar year tax payments. However, the second graph shows the large and somewhat erratic largely negative adjustments to cash based on prior year adjustments. Based on the two charts below there appears to be a strong correlation between calendar year current payments and calendar year prior year adjustments. When calendar year current payments decline significantly as seen in fiscal years ending 2002 and 2009 there is a corresponding increase (i.e. become more negative) in calendar year prior year adjustments. When calendar year current payments are relatively stable or increase, calendar year prior year adjustments are also relatively stable and do not increase (i.e. become more negative).





Most importantly, the tracking of payments from different periods helps establish a sense for the relationship between tax liabilities and underlying economic fundamentals as previously discussed. Observation and analysis of this trend is useful in adjusting model results for the outyear projections.

Receipts from the MTA Surcharge are estimated in the current year using the same historical ratio analysis employed to estimate General Fund receipts with audit and compliance receipts estimated separately. Outyear estimates are derived by multiplying 1) the ratio of non-audit General Fund receipts to non-audit MTA Surcharge receipts and 2) the applicable outyear General Fund estimates. Again, audit and compliance receipts are separately estimated.

Outyear Forecast

Several approaches are used to forecast outyear receipts:

- Examining the public profit forecasts for large multinational corporations with a significant presence in New York State.
- Employing the econometric model described below.
- Making adjustments to the model results to account separately for items such as tax law changes, audit receipts and known anomalies in cash results.

PERCENT CHANGE IN KEY VARIABLES
STATE FISCAL YEARS 2005-06 TO 2010-11

	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11 (Estimated)
GF Tax Collections*	43.4	38.0	(6.3)	(20.1)	(22.2)	34.6
Corporate Profits**	16.8	10.5	(6.1)	(16.4)	(0.4)	27.9
Tax Rates***	7.5	7.5	7.1	7.1	7.1	7.1

* Tax collection growth also reflects Tax Law changes and audit and compliance receipts.
** Corporate Profits were adjusted for 2002-03 for Federal depreciation allowances.
*** The tax rate represents the statutory tax rate paid under the entire net income base. Qualifying manufacturers and emerging technology companies are subject to a 6.5 percent rate (1/31/2007).

DOB Corporate Franchise Tax Cash Receipts Model

The estimate of corporate franchise tax cash receipts is derived using an econometric model as a guide, the results of which serve as one part of the overall process. The econometric model relates gross corporate franchise tax collections to corporate profits, previous collection patterns and the nominal tax rate in effect at that time.

Dependent Variable

- The logarithm of gross corporate franchise tax receipts, less audit and compliance receipts.

Corp. Prof.

- The logarithm of U.S. corporate profits, lagged one quarter.

Gross 9-A

- The logarithm of gross corporate franchise tax collections, lagged a full year (four quarters). This attempts to capture the effect of the cyclical element of the corporate franchise tax payment structure on future cash collections.

9-A Rate

- The nominal corporate franchise tax rate applied to the ENI base for a given period, lagged one year (four quarters). The ENI base is the base under which the majority of tax liability is incurred.

d013

- A dummy variable that accounts for an anomaly in cash receipts in the third quarter of 2001. Cash collections were disrupted due to the events of September 11, 2001.

dQ1

- A dummy variable that adjusts for the seasonality resulting from the typically larger first calendar year quarter (last State fiscal year quarter) cash receipts. Calendar year tax filers (which incur the majority of tax liability) typically report a portion of two tax liability years in this quarter. In March, both the final payment on the closing tax year's liability, as well as a pre-payment on the new tax year's liability, is due for these taxpayers. This seasonality is clearly demonstrated in the tables showing decomposition of the series later in this section.

The model corrects for first-order serial correlation, as shown by the second equation below.

CORPORATE FRANCHISE TAX CASH RECEIPTS MODEL

$$\text{Log(Gross 9-A}_t) = \underset{(1.274)}{0.1508} + \underset{(0.146)}{0.6182} * \log(\text{Corp. Prof.}_{t-1}) + \underset{(0.1170)}{0.2070} * \log(\text{Gross 9-A}_{t-4})$$

$$+ \underset{(0.035)}{0.0721} * (\text{9-A Rate}_{t-4}) - \underset{(0.093)}{0.3567} * (\text{d013}_t) + \underset{(0.042)}{0.2544} * (\text{dQ1}_t) + \text{Error}_t$$

$$\text{Error}_t = \underset{(0.131)}{0.5228} * \text{error}_{t-1} + \text{error}_t$$

Adj. R^2	0.81
RMSE	0.10
Number of Observations	63

Note: Values in parentheses under coefficients represent standard errors.

The model fits the volatile cash series reasonably well and implies a long-run elasticity with respect to profits of about 0.78. As expected, rates are positively related to cash collections. An estimate for refunds is derived using an historical average of forecasted gross receipts from the econometric model.

Historically, refunds have averaged approximately 11.7 percent of the two prior calendar years' gross receipts. However, recent volatility in refunds activity has necessitated model revisions, which are based on year-to-date cash results (cash refunds and prior year adjustments) and trended using model growth rates. This ensures that the historical relationship between gross receipts and refunds is considered, but adjusted to account for any unusual activity. The adjusted refunds estimate is then subtracted from the estimated gross receipts amount to arrive at a baseline, net cash receipts estimate.

Adjustment of Baseline Estimate

The baseline estimate is next adjusted for the estimated impact of Tax Law changes that are not captured by the tax rate variable. These adjustments can be a significant source of uncertainty since the estimates for law changes are themselves subject to a large degree of risk. As additional information from tax returns or other sources becomes available, revisions to the estimated impact of significant tax law changes such as Brownfield, Empire Zone and Film tax credits can produce substantial revisions to the net receipts estimate.

Additional adjustments are made for current cash receipts, since the model generally fails to fully incorporate recent payment trends. While economic and business conditions are themselves volatile, so are the taxpayer's estimates of their tax liability; as a result, adjustments for recent trends in the quarterly payment process are therefore an important step in the estimation process.

Audit and compliance receipts are extremely volatile and have no significant relationship with either the economy or industry trends. Therefore, audit and compliance receipts are analyzed independently and added to the baseline estimate. The audit and compliance estimate is highly dependent on recent trends and on the issues and industries being audited. As a result, the estimate relies heavily on the Department of Taxation and Finance to provide feedback on achievable targets. Even in instances where awareness of compliance issues exists, the timing and dollar value of any ensuing assessment or settlement payments are nearly impossible to predict. To illustrate the volatile nature of audit and compliance receipts, average audit receipts for the period SFY 1997-78 through SFY 2005-06 were $300 million. In SFY 2006-07 and SFY 2007-08 audit receipts were approximately $1 billion and declined to $778 million in SFY 2008-09 and $603 million in SFY 2009-10.

PERCENTAGE DISTRIBUTION OF GENERAL FUND COLLECTIONS				
	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
2001-02	30.0	21.4	21.7	27.0
2002-03	18.4	25.4	22.8	33.4
2003-04	12.8	28.6	19.9	38.7
2004-05	23.3	25.1	24.4	27.2
2005-06	27.4	22.3	19.3	31.0
2006-07	19.8	19.4	33.4	27.5
2007-08	18.9	22.0	23.5	35.6
2008-09	19.1	23.0	13.4	44.5
2009-10	20.5	28.2	19.1	32.2
2010-11 (est.)	17.8	14.2	28.5	39.5

Risks to the Forecast

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

- The most significant risks to the forecast come from the volatile relationships between economic and liability factors, and from difficulties in estimating the State Fiscal Year in which cash receipts from that liability will be received. These relationships can be greatly altered by numerous factors through time.

- Audit and compliance results are closely and separately monitored. While posing a substantial risk, adjusting this revenue source independently of baseline receipts helps to isolate the portion of receipts that is largely behavioral and administrative in nature, and not linked to economic fundamentals. This specific focus is a valuable risk management tool in projecting overall corporate franchise tax net receipts.

- The estimated impacts of Tax Law changes introduce yet additional risk. This risk can stem from errors in the estimation of new provisions, or from timing issues related to taxpayer awareness of, and voluntary compliance with, new laws.

- Error in the forecast of the corporate profits variable itself provides an additional risk to the corporate franchise tax estimate.

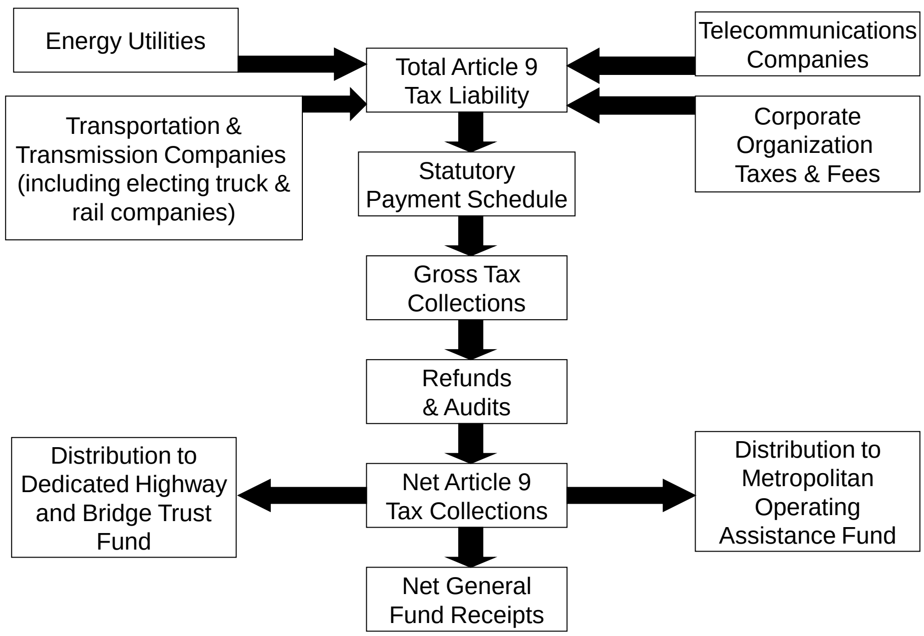
As a result, analyzing industry trends, monitoring the forecasts of other tax jurisdictions, constantly reevaluating the impact of large tax expenditures, and balancing risks resulting from audit and compliance receipts are necessary in adjusting the Division of the Budget’s corporate franchise tax forecast.

CORPORATION AND UTILITIES TAXES

BACKGROUND

Tax Base and Rate

Article 9 of the Tax Law imposes taxes on a number of different industries, including telecommunications companies, newly organized or reorganized corporations, out-of-State corporations doing business in New York State, transportation and transmission companies, public utilities, and farmers and agricultural cooperatives. The following chart shows the sources and disposition of Article 9 receipts.



The forecasts of estimated revenues from the transmission and distribution of energy and telecommunication services result from econometric model results and industry outlooks, respectively. All other sections of Article 9 are held constant and based on actual results from the most current, complete State fiscal year unless more specific information related to industry conditions, or Federal or New York tax law changes are known. Tax Law changes enacted in 2000 have had a significant effect on Article 9 receipts, especially the utility tax base.

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:

- AC015 Department of Taxation and Finance Monthly Report of Corporation Tax. This report, issued by the Office of Tax Policy Analysis (OTPA) of 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, issued by the OTPA, provides a detailed summary of corporation and utilities taxes data. The most recent report is for tax year 2006.

- Article 9 Corporation and Utilities Tax Study File. This file is compiled by the Department of Taxation and Finance and includes all corporations filing under Article 9. It includes selected data items from the tax returns of each corporation. The most recent data available are from the 2007 tax year.

- Value Line Investment Survey. Electricity, Natural Gas, and the Telecommunication Industries summaries are used in the estimation process.

- Securities and Exchange Commission (SEC) Web Site (http://www.sec.gov). This web site is monitored for relevant quarterly (10-Q) and annual (10-K) financial reports.

- New York State Public Service Commission. Reports annual utility data.

- Other Publications. Wall Street Journal, New York Times, Business Week, Barron's, and Crain's.

STATUTORY CHANGES

Legislation enacted in 2000 changed the base and rate of many of the taxes imposed under the corporation and utilities taxes. Between January 1, 2000, and January 1, 2005, the gross receipts tax imposed on the transmission and distribution of gas and electricity utility services was reduced from 3.25 percent to 2 percent for residential customers and was gradually eliminated for non-residential customers. In addition, the tax on the sale of the energy commodity was gradually eliminated. Effective January 1, 2000, the franchise tax imposed on public utilities and waterworks, gas, electric, steam heating, lighting and power companies was repealed, and these taxpayers became subject to the corporate franchise tax imposed under Article 9-A of the Tax Law.

For a detailed list of significant statutory changes made to the corporation and utility tax, please see the New York State Executive Budget, Economic and Revenue Outlook.

FORECAST METHODOLOGY

Current and outyear estimates for public utilities and telecommunications companies are based on a blend of historical collection patterns, simple trending techniques, estimates of underlying company liability, econometric models for key components of the base sensitive to economic or consumption changes, and statutory changes or other occurrences that may affect collections. The sections of the CUT (e.g., license fees and taxes on farmers and agricultural cooperatives) that tax other industries are kept constant because of their relatively low contribution to total CUT receipts. This approach focuses the analysis on those sections of tax receipts within the CUT that contribute the greatest to the total amount of variation.

Electricity and Natural Gas

Energy revenues (electricity and natural gas) typically include the sale of the commodity and charges from transportation, transmission, distribution or delivery of energy. Before 2000, all revenues were taxed at the same rate. As discussed above, total utility tax revenues now come from transportation and distribution charges from residential customers only.

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

EXOGENOUS VARIABLES Percent Change								
	2004	2005	2006	2007	2008	2009	2010 (Estimated)	2011 (Projected)
Price of Electricity NY - Residential	1.6	8.1	7.5	1.2	6.6	(2.4)	4.7	2.8
Personal Consumption of Electricity	3.9	11.1	9.5	5.5	4.8	1.2	7.3	5.9
Personal Consumption of Natural Gas	7.0	17.9	(2.8)	3.0	9.6	(15.8)	(2.6)	2.9

Since utility company revenues from residential customers include charges for both electricity and transportation and distribution, the non-taxable commodity (electricity) portion is removed from the total.

Tax rates are applied to projections of gross receipts to generate tax liability estimates. Payment schedules are applied to the liability estimates to derive State fiscal year cash receipts, which are then adjusted to reflect the estimated effects of law changes 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, (e.g., delayed returns, audits and refunds) occur during months not specified in statute.

The table below shows the equations for residential electricity and natural gas revenues of utility companies. Model receipts estimates for the current year are compared to current year estimates derived from historical ratio analysis, and outyear estimates are adjusted if large discrepancies occur.

ELECTRICITY AND NATURAL GAS EQUATIONS

$$\triangle \ln(ERES\_R) = \underset{(0.190)}{0.4378} * \triangle \ln(SEDESRCDNY) + \underset{(0.153)}{0.4423} * \triangle \ln(CSHHOPE)$$

Adj. R^2 = 0.37
RMSE = 0.04
N = 33

$$\triangle \ln(NGRES\_R) = \underset{(0.080)}{0.8490} * \triangle \ln(CSHHOPG) - \underset{(0.052)}{0.1604} * D2000 + \underset{(0.051)}{0.1040} * D2001$$

Adj. R^2 = 0.74
RMSE = 0.05
N = 33

ERES_R	Residential Revenues - Electricity
NGRES_R	Residential Revenues - Natural Gas
SEDESRCDNY	Price of Electricity – Residential
CSHHOPE	Personal Consumption Expenditures of Electricity
CSHHOPG	Personal Consumption Expenditures of Natural Gas
D2000	2000 dummy
D2001	2001 dummy

Note: Values in parentheses under coefficients represent standard errors.

The table below summarizes the forecast results from the model described above. The table represents total receipts from sales to residential customers. A third of revenues are assumed to come from transmission and distribution. A tax rate of 2 percent is then applied to the results and the resulting receipt estimates are distributed to the proper fiscal year.

NEW YORK UTILITY MODEL RESULTS

Fiscal Year Ending	New York Utility Residential Revenues (Sales * Price) (in millions)	Percent Change
2006	11,543	(0.9)
2007	11,978	3.8
2008	11,880	(0.8)
2009	11,146	(6.2)
2010	11,401	2.3
2011	11,775	3.3

The tables below report annual consumption and price data for electricity and natural gas. While the data are not used in the econometric model employed, monitoring this information informs the forecast. The information shown for the years 2001 to 2008 is based on published reports of the New York State Public Service Commission (PSC). Calendar year 2008 represents the most recent year for which data are available for both electricity and natural gas. The quantities (in millions) shown in the first table report sales to both residential and non-residential consumers and include sales for resale. The sales figures represent sales of electricity to full-service customers who receive their commodity and transportation services from the utility. The reduction in electricity sales represents, in part, the migration of some full-service customers to partial-service status as energy service company (ESCO) customers, which are not included in the PSC publication. The electricity and gas prices shown in the second table reflect an average of residential, commercial and industrial prices

CALENDAR YEAR HISTORY OF ELECTRICITY AND NATURAL GAS SALES 2001 - 2008				
Year	Electricity Sales (kilowatt hours)	Percent Change	Gas Sales (MCF)	Percent Change
2001	103,390	(2.1)	551.6	(13.3)
2002	97,360	(5.8)	580.7	5.3
2003	95,169	(2.3)	518.3	(10.7)
2004	109,098	14.6	485.5	(6.3)
2005	109,359	0.2	498.5	2.7
2006	106,015	(3.1)	581.3	16.6
2007	106,265	0.2	613.9	5.6
2008	101,353	(4.6)	613.8	0.0

CALENDAR YEAR HISTORY OF ELECTRICITY AND NATURAL GAS PRICES 2001 - 2008				
Year	Electricity Price Per Kilowatt Hour Sold (cents)	Percent Change	Gas Price Per MCF Sold (dollars)	Percent Change
2001	12.70	1.6	10.84	22.8
2002	12.43	(2.1)	9.64	(11.1)
2003	13.25	6.6	11.65	20.9
2004	11.30	(14.7)	10.96	(5.9)
2005	12.45	10.2	13.24	20.8
2006	12.14	(2.5)	14.21	7.3
2007	12.43	2.4	14.05	(1.1)
2008	18.04	45.1	14.70	4.6

Telecommunications

The forecast assumes historically modest outyear growth in the telecommunications sector. The history and forecasted growth in revenues, from Valueline, of the telecommunications services industry in general and Verizon in particular are shown below. These growth rates, as well as the recent history of cash receipts are considered in generating the telecommunications forecast.

PERCENT CHANGE OF TELECOMMUNICATIONS REVENUES Calendar Year					
	2007	2008	2009	2010 (Estimated)	2011 (Projected)
Telecommunications	26.9	(2.7)	5.2	4.5	6.1
Verizon	6.0	4.2	10.7	(1.3)	1.6
Source: www.valueline.com (as of September 24, 2010).					

Cash Receipts

The table below illustrates General Fund collections on a quarterly basis. State fiscal year 2010-11 displays an unusual pattern due to the loss of a tax tribunal decision and a late June payment received in July. These items caused first quarter 2010-11 receipts to be unusually low compared to history.

PERCENT DISTRIBUTION OF GENERAL FUND COLLECTIONS				
	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
2001-02	23.6	26.0	27.1	23.3
2002-03	18.9	23.6	27.1	30.4
2003-04	19.8	24.3	27.4	28.5
2004-05	19.5	23.6	26.7	30.2
2005-06	18.6	24.7	25.8	30.9
2006-07	21.0	22.3	29.2	27.5
2007-08	19.2	25.8	26.0	29.0
2008-09	20.1	23.9	28.2	27.8
2009-10	22.4	21.2	25.7	30.7
2010-11 (est.)	13.5	22.1	27.5	36.9

Receipts for the Mass Transportation Operating Assistance Fund (MTOAF) are generated from the MTA Surcharge and a dedicated portion (80 percent) of receipts from Sections 183 and 184 of the Corporation Utilities Tax. Receipts from the MTA Surcharge are estimated in the current year using the same historical ratio analysis employed to estimate General Fund receipts with audit and compliance receipts estimated separately. For the outyears, estimates are arrived at by multiplying 1) the ratio of non-audit General Fund receipts to non-audit MTA Surcharge receipts and 2) the applicable outyear General Fund estimates. Again, audit and compliance receipts are separately estimated. Receipts from Sections 183 and 184 are estimated in the current year based on actual cash collections and the historical trend for the outyear estimates.

Risks to the Forecast

The corporate and utilities forecasts involve managing uncertainties as follows:

- examining economic factors such as energy prices, changes in supply and demand, business market conditions, changes in technology, and general inflation; and

- analyzing statutory, regulatory and administrative changes, including Federal tax law changes that affect tax rates and bases.

INSURANCE TAXES

BACKGROUND

Tax Base and Rate

The Tax Law imposes a franchise tax on insurance companies and a premiums tax on independently procured insurance. The Insurance Law also imposes retaliatory taxes and other premiums taxes on certain insurance brokers. Legislation enacted in 2003 and effective for tax years beginning January 1, 2003 changed the structure of the insurance tax.

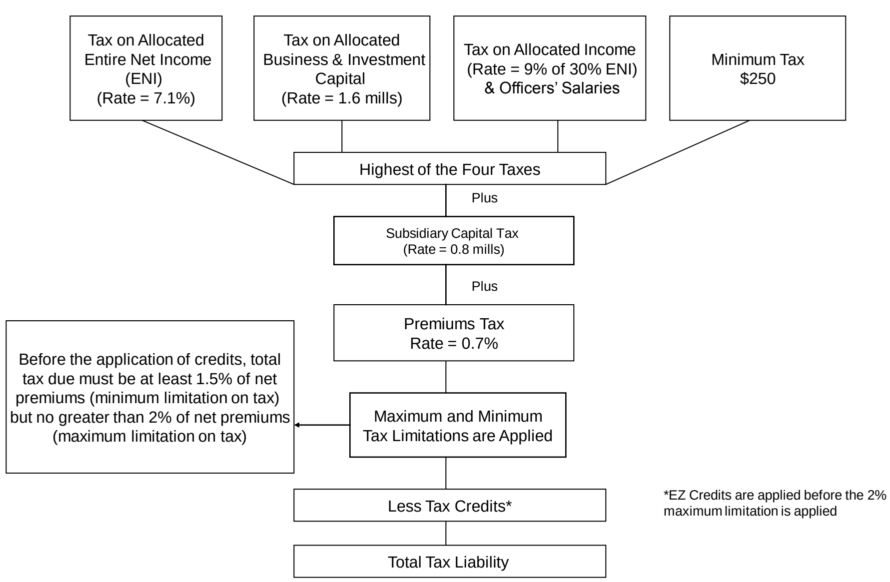
Life Insurers

For life insurers, the tax structure includes two components. The first component is an income-based tax computed on the highest of four bases, plus a tax on subsidiary capital. The second component is a tax based on gross direct premiums, less return premiums thereon, written on risks located or resident in New York. Minimum and maximum limitations are applied to total tax liability before credits. The minimum limitation is 1.5 percent of premiums and the maximum limitation is 2 percent of premiums.

The income 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. For taxable years starting on and after January 1, 2007, the tax rate on ENI equals 7.1 percent. Taxpayers allocate receipts according to the ratio of New York premiums and payroll to total premiums and payroll nationwide.

The chart below depicts the structure of the insurance tax imposed on life insurers.

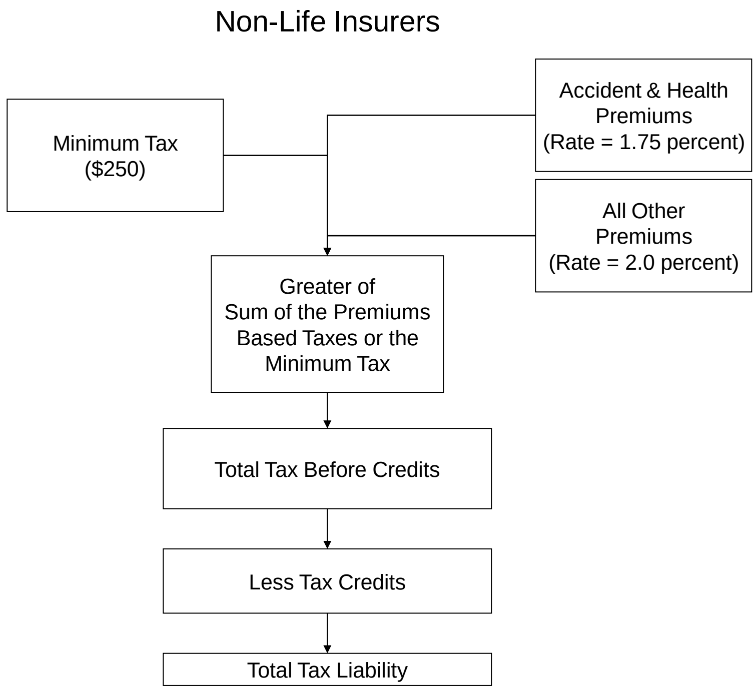
Computation of Article 33 Tax on Life Insurance Companies



Non-Life Insurers

Non-life insurance companies pay tax solely on gross direct premiums, less return premiums written on risks located or resident in the State. The premiums base tax is 1.75 percent for accident and health premiums and 2.0 percent for all other premiums. Non-life insurers are subject to the fixed dollar minimum tax.

The chart below depicts the structure of the insurance tax for all non-life insurers.



Tax Base and Rate

The Insurance Law authorizes the Superintendent of Insurance to assess and collect retaliatory taxes from a foreign (i.e., domiciled in another state) 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. New York provides an additional measure of protection for its domestic insurance industry by allowing domestic corporations to claim a credit under 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 at the rate of 3.6 percent 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 prescribed under the Insurance Law.

DATA SOURCES

The insurance tax estimate is derived using a variety of public and private sector data sources, including:

- Insurance Tax Study File. This file, compiled by the Department of Taxation and Finance, includes selected data from all businesses filing tax returns under the Tax Law. The most recent tax year reflected in the study file is 2007.

- AC015 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. The most recent report is for tax year 2006.

- 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 and data from premiums taxes and retaliatory taxes imposed under the Insurance Law.

- Excess Lines Association of New York State (ELANYS). Industry information on excess lines premiums written in the State of New York.

- Other Publications. Wall Street Journal, New York Times, Business Week, Barron's, A.M. Best Review, and Crain's.

STATUTORY CHANGES

Effective in tax years beginning January 1, 2003, legislation changed the tax imposed on non-life insurance companies from a franchise tax based on income to a franchise tax based solely on gross direct premiums less return premiums (i.e., those paid against claims). Accident and health premiums are subject to a tax rate of 1.75 percent, and all other non-life premiums are subject to a tax rate of 2 percent. Non-life insurance companies are subject to a minimum tax of $250. The structure of the franchise tax on income imposed on life insurance companies was not changed; however, a minimum tax of no less than 1.5 percent of premiums (computed prior to the application of tax credits) was imposed. Effective in tax years beginning January 1, 2007, the rate imposed on the ENI base for life insurers was changed from 7.5 percent to 7.1 percent. For tax years beginning January 1, 2009 and after, Health Maintenance Organizations (HMOs) that previously were subject to the Article 9-A corporation franchise tax are now subject to the Article 33 insurance tax.

For a detailed list of significant statutory changes made to the insurance tax, please see the New York State Executive Budget, Economic and Revenue Outlook.

FORECAST METHODOLOGY

Current year estimates are based on historical collection patterns using year-to-date receipts information. Historically, statutory payment requirements coupled with the relatively low volatility of the tax base have made this approach fairly reliable. However, this approach still requires adjustments for administrative factors such as audit and compliance receipts, accounting adjustments, and other issues that may distort year-to-date results.

The outyear estimation process involves several steps:

7. Deriving annual growth rates for the major determinants of tax liability, specifically property and casualty premiums, accident and health premiums, life premiums, and the aggregate entire net income of life insurers;
8. Using the growth rates above to trend tax year liability in a micro-simulation model based on the actual calculation of tax employed in each tax year. The base year is the tax year for which the most recent study file of returns is available (2007);
9. Comparing simulated liability from years which have already occurred to payments on liability for that tax year to adjust results where appropriate;
10. Making additional adjustments for the estimated impact of law changes;
11. Converting adjusted current year payment estimates to a State Fiscal Year cash estimate using historical relationships between current year payments and other payments (pre-payments, prior year adjustments, etc.); and
12. Adding estimates for audit and compliance receipts recovered by the Department of Taxation and Finance, and tax collections received by the State Insurance Department.

Deriving Component Annual Growth Rates

The aggregate taxable premiums of life insurers are trended from the most recently available study file, currently 2007, using a simple time trend that reasonably fits the premiums series. The same technique is applied to the property and casualty insurance premiums series, except that a correction for first-order serial correlation is made. The time trend results are compared to the compound annual growth rate for each series, which can serve as an alternative estimation method.

Taxable accident and health premiums are regressed against a one-year, lagged-dependant variable and a dummy variable for premium data from 1991. The dynamic approach results in a coefficient that is statistically significant, demonstrates the correct sign and is intuitive to interpret. For this series, a time trend approach results in a large, non-significant intercept, and a non-significant, negative coefficient estimate for the Time variable.

Finally, the aggregate entire net income of life insurers is fit against before tax corporate profits. While the amount of variation explained by this approach is relatively modest, life insurance ENI is itself a modest contributor to total insurance tax liability. Life insurers are approximately 20 percent of total insurance tax liability. However, the results can be adjusted as necessary using information from Valueline and SEC earnings statements.

INSURANCE TAX LIABILITY GROWTH RATE EQUATIONS

$$\text{P/C premiums}_t = \underset{(7{,}198.1)}{8{,}579.7} + \underset{(399.2)}{1{,}012.5}*(\text{Time}_t) + \underset{(0.18)}{0.81}*\text{Error}_{t-1} + \text{error}_t$$

$$\text{A/H premiums}_t = \underset{(283.4)}{167.6} + \underset{(0.1)}{1.1}*(\text{A/H premiums}_{t-1}) + \underset{(1{,}040.1)}{1{,}322.4}*\text{Dummy (1991)} + \text{error}_t$$

$$\text{Life premiums}_t = \underset{(339.3)}{8{,}035.4} + \underset{(24.2)}{271.7}*(\text{Time}_t) + \text{error}_t$$

$$\text{ENI(life)}_t = \underset{(2{,}384.9)}{1{,}323.7} + \underset{(2.7)}{9.8}*(\text{Corp. Profits}_t) + \text{error}_t$$

	P/C	A/H	Life	ENI
Adj. R^2	0.91	0.93	0.86	0.37
Root Mean Square Error	1,595.6	1,005.7	720.2	5,500.4
Number of Observations	22	22	22	22

Note: Values in parenthesis under coefficients represent the standard error.

Dependent Variables

- Annual taxable property/casualty, accident/health and life and insurance premiums, as well as the aggregate, annual ENI of the life insurance industry.

Corp. Prof.

- Before-tax U.S. corporate profits from the National Income and Product Accounts.

Time

- A time-series estimation technique that employs a numeric variable synonymous with the observation (i.e., at observation_1, Time=1; at $\text{observation}_{2,}$ Time=2, etc.). This effectively is a substitute for a non-observable variable that both affects the dependent variable, and is substantially correlated with time.

Dummy 1991

- A dummy variable that accounts for an anomaly in accident/health premiums for 1991.

Total taxable property and casualty premiums are reported annually in the Department of Taxation and Finance, Office of Tax Policy Analysis Insurance Study File. Additional information from the Insurance Department provides insight as to the composition of the five largest lines of property and casualty business – automobile, workers' compensation, commercial multi-peril, general liability, and homeowners' multi-peril. The growth rates of these lines are reported below.

CALENDAR YEAR PREMIUMS GROWTH (GROWTH RATE PERCENTAGES) 2001-2008

	2001	2002	2003	2004	2005	2006	2007	2008
Property/Casualty (Total Premiums)	11.7	14.6	6.0	(1.9)	5.3	4.0	2.0	(1.3)
Automobile	11.5	10.4	6.9	1.2	(4.1)	(2.5)	(4.2)	(0.5)
Workers Compensation	4.1	4.0	(0.3)	(43.3)	95.0	9.9	2.3	(17.2)
Commercial Multi-Peril	12.8	14.3	3.4	4.2	2.1	3.9	(0.1)	(0.4)
General Liability	14.3	41.7	7.6	7.4	(0.5)	9.8	(1.8)	4.2
Homeowners Multi-Peril	6.1	7.8	9.0	9.4	8.0	5.5	8.1	4.4

Source: New York State Insurance Department

While the more detailed information from the Insurance Department is not used directly in the time trend since this series does not represent taxable premiums, it is monitored for any distinctive trends within individual lines that may impact estimate results.

Micro-Simulation Model

The growth rates generated from these approaches are then entered into a simulation model that calculates liability for taxpayers included in the most recent study file, which currently reports information from insurance tax returns for the 2007 tax year. Liability is simulated from a 2007 base for years that have already occurred (i.e. 2008 and 2009). Model results are adjusted by comparing them to publicly available industry estimates and to known cash results for those years.

Cash Receipts

State fiscal year 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. The adjusted simulation results effectively provide estimates of tax year liability. Historical relationships between payments on tax year liability and prior year adjustments are considered in converting the liability estimate to a State Fiscal Year net cash estimate.

Separate estimates for audit and compliance receipts as well as State Insurance Department collections are added to these amounts. Audit and compliance receipts estimates are made in conjunction with the Department of Taxation and Finance, while estimates of State Insurance Department collections are partially based on excess lines premiums data from ELANYS.

COMPARISON OF PERCENTAGE GROWTH RATES IN ESTIMATED LIABILITY, FINAL LIABILITY, AND STATE FISCAL YEAR COLLECTIONS				
Calendar Year	**Installment Liability Growth Rate[1]**	**Study File Liability Growth Rate[2]**	**State Fiscal Year**	**General Fund Net Collections Growth Rate[3]**
2001	(2.7)	(1.2)	2001-02	7.7
2002	10.5	8.1	2002-03	6.8
2003[4]	26.2	34.8	2003-04	32.1
2004	7.1	8.6	2004-05	8.3
2005	4.7	0.3	2005-06	(2.0)
2006	1.5	7.1	2006-07	15.7
2007	7.8	(0.4)	2007-08	(4.7)
2008	(3.1)	NA	2008-09	(0.3)
2009[4]	16.0	NA	2009-10	22.6
2010 (est).	7.4	NA	2010-11 (est.)	(4.0)

[1] Estimated liability is the sum of the taxpayers' first installment and the June, September, December, and March payments on current liability. Liability for 2010 is estimated.
[2] Information from Department of Taxation and Finance Insurance Tax Study File.
[3] State fiscal year General Fund collections as reported by OSC.
[4] Insurance Tax Law restructuring changes in 2003 and the HMO tax in 2009 impacted installment liability and General Fund Net Collections in each of those years.

The table below shows General Fund collections on a quarterly basis. Insurance companies make tax payments on an estimated basis in March (i.e. first installment), June, September and December. A final payment is made in March. For tax years starting January 1, 2003 through January 1, 2005 and the tax year starting January 2009, certain non-life companies paid a first installment based on 30 percent, rather than 25 percent, of the prior year's tax liability. For all tax years starting on or after January 1, 2010, the first installment due in March is equal to 40 percent of the prior year liability for all taxpayers.

PERCENT DISTRIBUTION OF GENERAL FUND COLLECTIONS				
	1st Quarter	**2nd Quarter**	**3rd Quarter**	**4th Quarter**
2001-02	24.4	21.3	21.4	32.9
2002-03	22.2	24.2	19.9	33.8
2003-04	22.0	24.3	19.9	33.8
2004-05	20.0	22.3	20.9	36.8
2005-06	21.3	22.5	22.8	33.4
2006-07	21.6	23.5	20.9	33.9
2007-08	24.0	24.6	21.2	30.2
2008-09	22. 8	20.6	20.5	36.1
2009-10	20.5	17.8	20.9	40.9
2010-11(est.)	17.3	20.3	25.9	36.5

Receipts from the MTA Surcharge are estimated in the current year using the same historical ratio analysis employed to estimate General Fund receipts with audit and compliance receipts estimated separately. For outyears, estimates are arrived at by multiplying 1) the ratio of non-audit General Fund receipts to non-audit MTA Surcharge receipts and 2) the applicable outyear General Fund estimates. Again, audit and compliance receipts are separately estimated.

Risks to the Forecast

The insurance forecast involves managing uncertainty about turning points in the premiums cycle, and therefore premiums growth, caused by:

- the underwriting discipline and performance of industry members;
- changes in surplus and reserves resulting from investment portfolio and annuity sales and results;
- changes in the demographic and competitive environment, including regulatory changes; and
- unexpected catastrophes.
- the passage of the Dodd-Frank Wall Street Reform and Consumer Protection Act places restrictions on the imposition of a premiums tax on non-admitted insurance. This adds risk to a portion of the outyear insurance tax forecast.

PETROLEUM BUSINESS TAXES

BACKGROUND

Tax Base and Rate

A privilege tax is imposed 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: The base tax and the supplemental tax. The tax rates vary by product type. 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, and crude oil are also exempt.

A petroleum business carrier tax is imposed 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.

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 (PPI) 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 PPI is published by the Bureau of Labor Statistics of the United States Department of Labor.

FUEL PRICE AND PETROLEUM BUSINESS TAX RATE INDEX
(percent change)

Year	Petroleum PPI	PBT Rate Index
2001	55.84	5.00
2002	13.08	5.00
2003	(19.51)	(5.00)
2004	27.01	5.00
2005	12.94	5.00
2006	35.10	5.00
2007	36.01	5.00
2008	(1.20)	(1.20)
2009	42.08	5.00
2010	-35.09	(5.00)
2011	19.63	5.00

It should be noted that the change in the PBT tax rates is capped at five percent. 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 tax rates from indexing are usually slightly less than the five percent tax rate cap. Rates are also affected by statutory changes that may complement or offset the changes due to indexing.

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 most of the 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 and ethanol, become subject to the tax on their first sale as motor fuel in the State. Automotive diesel 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.

Under 1992 legislation, businesses with yearly motor fuel and petroleum business tax liability of more than $5 million are required to remit, using electronic funds transfer, their tax liability for the first 22 days of the month within three business days after that date. Taxpayers can choose to make either a minimum payment of three-fourths of the comparable month’s tax liability for the preceding year, or 90 percent of actual liability for the first 22 days. The tax for the balance of the month is paid with the monthly returns filed by the twentieth of the following month.

DATA SOURCES

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

- AM043, Department of Taxation and Finance Monthly Report of Receipts. This report contains gross and net receipts data.

- 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. These are 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.

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 for fuel used for commercial heating, fully exempted fuels used for manufacturing, and reduced the supplemental tax on diesel fuel by 1.75 cents per gallon. Legislation in 1999 reduced the basic tax rate on commercial heating by 20 percent. Legislation in 2000 further reduced the basic tax rate on commercial heating by 33 percent. Legislation in 2004 eliminated PBT on fuels used for aircraft overflight and landing and exempted fuel burned on takeoff by airlines operating non-stop flights between at least four cities in New York. Legislation in 2006 exempted or partially exempted PBT on alternative fuels.

FORECAST METHODOLOGY

Forecasting PBT revenue is a two-step process. First, a forecast of demand (gallons) is produced from annual (fiscal year) or quarterly data and the various tax rates, which is adjusted for indexing. The Division of the Budget forecasts the PPI used for indexing based on historical data. 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.

Step One: Estimate of 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. It estimates 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 0.56 percent. To derive a State level forecast, real New York disposable income growth is substituted for GDP. Gasoline accounts for approximately 85 percent of PBT receipts.

PERCENT CHANGE IN EXOGENOUS VARIABLES		
	Real NY Disposable Income	NY Gasoline Price
2001-02	(1.0)	(4.0)
2002-03	2.1	2.6
2003-04	1.8	7.8
2004-05	2.6	19.3
2005-06	1.5	21.7
2006-07	3.9	8.6
2007-08	3.0	13.2
2008-09	(1.0)	0.2
2009-10	2.5	(13.5)
2010-11 (est.)	2.0	8.5

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. 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 for the first calendar quarter is used to reflect seasonal consumption patterns. The equation is estimated in log form and is corrected for first-order serial correlation. Diesel fuel accounts for approximately 12 percent of PBT receipts. The estimated equation is as follows:

DIESEL CONSUMPTION EQUATION

$$\text{Log(Diesel gallons}_t) = \underset{(0.253)}{7.905} + \underset{(0.028)}{1.207} \log(\text{GDPreal}_t) + \underset{(0.053)}{0.661} \text{ Dummy}_t - \underset{(-0.020)}{0.120} \text{ Dqt1}_t + u_t$$

$$u_t = \underset{(-0.072)}{-0.545} * u_{t-1}$$

Adjusted R-Bar Squared	0.95
Root Mean Squared Error	0.103
Number of Observations	142

Note: Values in parentheses under coefficients represent standard errors

The model suggests a strong link between diesel consumption and real GDP. The elasticity of diesel gallons to real GDP is roughly 1.2.

Utility Residual Fuels

Residual fuels are burned by electric utilities to produce electricity. The majority of power generators 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. In 2005-06, residual fuel accounted for 7.5 percent of PBT receipts. In 2008-09 and 2009-10, residual fuel accounted for 2.4 percent and 0.7 percent of PBT receipts, respectively.

Step Two: 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 and tax law and administrative changes.

Cash Receipts

PERCENTAGE DISTRIBUTION OF CASH RECEIPTS				
	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
2001-02	24.2	24.1	24.8	26.9
2002-03	24.7	27.7	24.0	23.6
2003-04	24.6	26.8	22.8	25.7
2004-05	24.9	25.9	24.6	24.6
2005-06	23.6	27.6	24.1	24.6
2006-07	23.6	26.4	23.7	26.3
2007-08	24.4	26.0	25.2	24.4
2008-09	24.1	26.3	25.1	24.6
2009-10	25.8	26.0	25.5	22.7
2010-11 (est.)	24.4	27.2	24.3	24.1

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. Gasoline and diesel fuel prices have fluctuated greatly over the past year. Changes in fuel prices may change fuel consumption, especially residual fuel consumption. Roughly 53% of power generators have the ability to switch from residual fuel to natural gas. Since natural gas is currently less expensive than residual fuel, consumption of residual fuel has dropped significantly in the last few years. Fuel price changes may also affect fuel inventories, the PBT index, and tax rates.

ESTATE TAX

TAX BASE AND RATE

New York imposes a tax on the estates of deceased State residents and on that part of a nonresident's estate made up of real and tangible personal property located within New York State. The New York estate tax is based on the estate tax provisions of the Federal Internal Revenue Code as amended through July 22, 1998, with New York modifications.

The tax base is calculated by first determining the value of the gross estate using Federal estate tax provisions. The Federal gross estate comprises the total amount of real estate, stocks and bonds, mortgages, notes, cash, insurance on the decedent's life, jointly owned property, other miscellaneous property, transfers during the decedent's life, powers of appointment, and annuities that the decedent owned.

The Federal gross estate is reduced by the Qualified Conservation Easement Exclusion and the following deductions: funeral expenses and expenses incurred in administering property subject to claims; debts of the decedent; mortgages and liens; net losses during administration; expenses incurred in administration of the property not subject to claims; bequests to a surviving spouse (marriage deduction); charitable, public, and similar gifts; and a qualified family-owned business interest deduction. This yields the taxable estate for New York and becomes the basis for calculating New York's estate tax.

The total value of all items of real and tangible personal property of the taxpayer located outside of New York State is divided by the taxpayer's Federal gross estate to arrive at the proportion of the estate outside New York State. This proportion is then used to allocate the Federal credit for state death taxes to New York to arrive at the New York State estate tax.

New York's estate tax is calculated by using the Unified Rate Table and the table for computing the maximum New York State credit for state death taxes as they were in effect on July 22, 1998. The New York estate tax is equal to the amount of the credit for state death taxes, which cannot exceed the amount of the Federal tax based on the July 22, 1998, rates and the current State unified credit. The computation of maximum New York State credit for state death taxes is a graduated schedule with rates that range from 0.8 percent on adjusted taxable estates in excess of $40,000 but less than $90,000, to 16 percent on adjusted taxable estates for New York State of $10,040,000 or more. Estates of $1 million or less are exempt from the estate tax, corresponding to the exemption level from the unified credit.

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:

- AM043, Department of Taxation and Finance Monthly Report of Receipts. This report contains gross and net monthly receipts data.
- Various reports, Department of Taxation and Finance. Other reports supplementing the AM043 provide information on daily receipts and other relevant data.
- Office of the State Comptroller. Monthly reports containing collection data.
- 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

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 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 with a 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 outlined below, the State's estate tax rate structure, credits and exemptions were eliminated with the result being that the State will only receive an amount equal to the maximum Federal credit for state death taxes (the "pick-up tax").

1) The 1997 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.

2) 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 1997 legislation also tied the State's unified credit to the Federal unified credit, but capped the State's credit at $1 million. This allowed for the State credit to increase up to $1 million along with the scheduled increases in the Federal credit, meaning estate of $1 million or less are exempt from the estate tax.

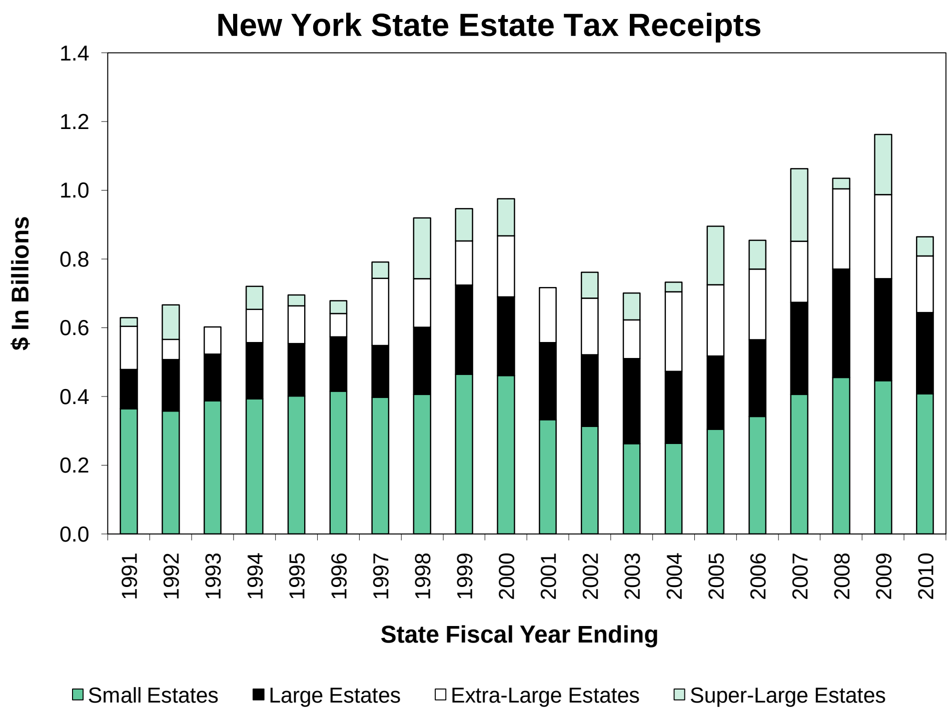
On March 23, 2001, the Federal estate tax law was amended to repeal the tax over a ten-year period. The unified credit was increased to an exemption level of $1 million for 2002, and up to $3.5 million by 2009. However, the New York unified credit remained capped at $1million. The Federal credit for state death tax was reduced by 25 percent per year beginning in 2002 and was eliminated in 2005. New York does not automatically conform to the change since the New York estate tax is imposed pursuant to the Internal Revenue Code of July 22, 1998; therefore, New York State estate taxpayers generally are not affected by any changes to Federal statute after that date.

Legislation enacted in 2010 decoupled the New York State unified credit from the Federal credit and set the at State exemption level at $1 million.

FORECASTING METHODOLOGY

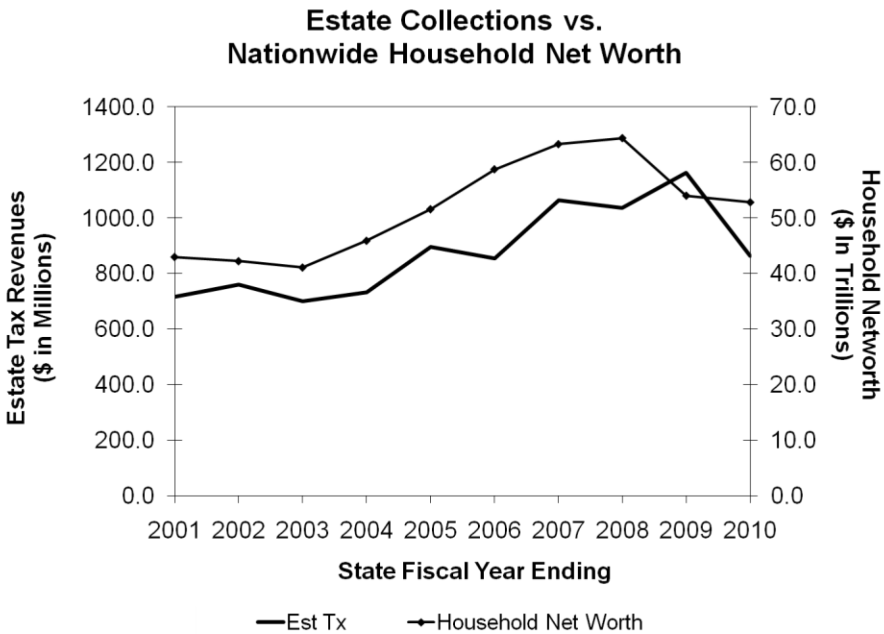
Economic variables alone cannot explain variances in revenues from this source. Not only is it nearly impossible to forecast wealthy taxpayer mortality, it is also difficult to forecast the taxability of the decedent's estate. To the extent that the estate is left to a spouse, or to a charitable trust, there is no liability. 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" and the increase in the Unified Credit to an exemption level of $1 million. While a model using household assets and stock market indicators fits the payment data for the smaller estates, the value of exemptions and the rapidly increasing unified credit complicate the estimate. In projecting current year receipts, an analysis of historical trends supplements the econometric analysis.

The following graph provides a history of collections (by size of estate payment) through the most recently completed fiscal year.



Econometric and Statistical Analysis

For purposes of projecting estate taxes, collections are separated into categories of super large estates (tax payment of at least $25 million), extra large estates (tax payment of at least $4 million but less than $25 million), large estates (tax payment of at least $500,000 but less than $4 million), and small estates (less than $500,000). To forecast collections in the super- and extra-large categories, the numbers of super-large and extra-large estates over the last 15 years are fit 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, a growth factor, based on estimated changes in household net worth, is applied to determine the nominal taxable base.



To estimate large estates, a regression equation is estimated with quarterly collections as the dependent variable. The main independent variable is a measure of household net worth which is a proxy 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 two quarters later. This corresponds to the valuation methodology in State statute. The Unified Credit exemption level, expressed in real terms by deflating the nominal amount by an index of household net worth, is also used as an independent variable.

RECEIPTS FROM LARGE ESTATES	
Large estate tax collections $_t$ = -3,726 + 1.81 * Household Net Worth$_t$ -0.021 *Real Exemption Level$_t$ + u $_t$	
(5,228) (0.23) (0.006)	
Adjusted R Squared	0.7130
Root Mean Squared Error	9,611
Number of Observations	83

Note: Values in parentheses under coefficients represent standard errors.

Quarterly collections from small estates are estimated by taking the average results of two regression equations. The first equation uses the Wilshire 5000 stock index and the average existing single family home price in New York as independent variables. These measures are also used at their minimum of the value at time of death or their value two quarters later. In addition, the top marginal tax rate of the estate tax and the Unified Credit exemption level, expressed in real terms by deflating the nominal amount by an index of household net worth, and a trend variable beginning in 2000 are included in the equation.

RECEIPTS FROM SMALL ESTATES EQUATION ONE
Small estate tax collections $_t$ = -110,735 - 0.0353 * Real Exemption Level$_t$ + 795,194 * Top Estate Tax Rate$_t$
(30,255) (0.02) (144,803)
+ 3.3366*Wilshire 5000$_t$ + 226.2 * Average Value of a Single Family Home in New York$_t$ + 1,722 * Trend$_t$ + u $_t$
(0.6) (150.2) (248.6)
Adjusted R Squared 0.6698
Root Mean Squared Error 11,598
Number of Observations 83

Note: Values in parentheses under coefficients represent standard errors.

The second equation uses household net worth and the average existing single family home price in New York as independent variables. Household net worth is squared to capture the larger change in small estate tax payments in relation to household net worth. The top marginal tax rate of the estate tax and the Unified Credit exemption level, expressed in real terms by deflating the nominal amount by an index of household net worth are also used in the second equation.

RECEIPTS FROM SMALL ESTATES EQUATION TWO
Small estate tax collections $_t$ = -104,572 - 0.0108 * Real Exemption Level$_t$ + 895,352 * Top Estate Tax Rate$_t$
(36,372) (0.02) (166,704)
+ .0000222*Household Net Worth^2_t + 21.4 * Average Value of a Single Family Home in New York$_t$ + u $_t$
(0.0000005) (195.3)
Adjusted R Squared 0.5261
Root Mean Squared Error 13,806
Number of Observations 83

Note: Values in parentheses under coefficients represent standard errors.

Receipts History

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

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011 Estimated
Total Receipts	761	701	732	895	855	1,063	1,037	1,162	865	1,015
Percent Change	6.1	-7.9	4.4	22.3	-4.5	24.3	-2.4	12.2	-25.6	17.5
Small Estate[1]	313	262	264	305	353	406	455	446	408	456
Large Estate	209	248	209	213	229	268	316	297	236	275
Super/Extra-Large Estates	239	191	259	377	273	389	266	419	221	284

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

Cash Receipts

Cash receipts vary greatly by quarter due to the random nature of large estate tax payments.

PERCENTAGE DISTRIBUTION OF GENERAL FUND COLLECTIONS	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
2001-02	25.7	18.3	28.6	27.4
2002-03	28.6	28.8	21.2	21.4
2003-04	22.5	27.6	28.3	21.6
2004-05	21.0	17.8	19.5	41.7
2005-06	27.7	28.0	24.5	19.8
2006-07	27.3	24.0	34.2	14.6
2007-08	25.3	22.8	26.5	25.4
2008-09	26.6	37.1	22.7	13.6
2009-10	23.9	32.3	22.7	21.1
2010-11 (est.)	27.0	34.0	19.5	19.5

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 took effect on July 1, 1989, and is imposed on conveyances of residential real property for which the consideration is $1 million or more at a rate of 1 percent of the total 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.

DATA SOURCES

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

- AMO43, 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., New York State and New York City government agencies, including the U.S. Bureau of Economic Analysis of the Commerce Department. These agencies provide economic data used in the econometric equation.

- Various real estate industry sources including: Moody's Economy.com, National Association of Realtors, Prudential Douglass Ellison Real Estate (Market Reports); and the Furman Center for Real Estate and Urban Policy at NYU School of Law.

FORECAST METHODOLOGY

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 55 percent and 70 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 or the nation as a whole, and to the sometimes speculative nature of expected returns on commercial real estate transactions.

A regression equation is estimated with the logarithm of fiscal year liability (excluding the mansion tax) divided by the tax rate, which yields the log of the dollar value of transfers, as the dependent variable. Independent variables in the model are: the average existing single-family home price in New York State, New York State housing starts, Manhattan office building vacancy rates, and a dummy variable that captures a large decline in the value of conveyances during the 1980 State fiscal year beyond what the other variables in the model can capture.

Mansion tax receipts are estimated in a separate equation, in which the average existing single-family home price in New York State and Manhattan office building vacancy rates are the primary explanatory variables, with a dummy value added for the 2008 State fiscal year to capture the extraordinary volume of real estate market activity during the period related to a market bubble that has since collapsed. The period of observation is SFY 1974-75 to 2009-10.

REAL ESTATE TRANSFER TAX EQUATIONS

$$\ln RETTN_t = \underset{(0.023)}{1.483} \ln PAHNY_t + \underset{(0.012)}{0.327} \ln \text{HUSTSNY}_t - \underset{(0.004)}{0.014} \Delta \text{VACNYC}_t - \underset{(0.004)}{0.011} \Delta \text{VACNYC}_{t\text{-}1} - \underset{(0.076)}{0.224} \text{ D1980}_t$$

Adjusted R^2 0.993

RMSE=0.0727

Number of Observations= 35

$$RETTM_t = -\underset{(13.16)}{170.2} + \underset{(0.066)}{1.347} \ln PAHNY_t - \underset{(0.851)}{1.382} \Delta \text{VACNYC}_t + \underset{(18.75)}{85.95} \text{ D2008}_t$$

$Adjusted\ R^2 = 0.970$

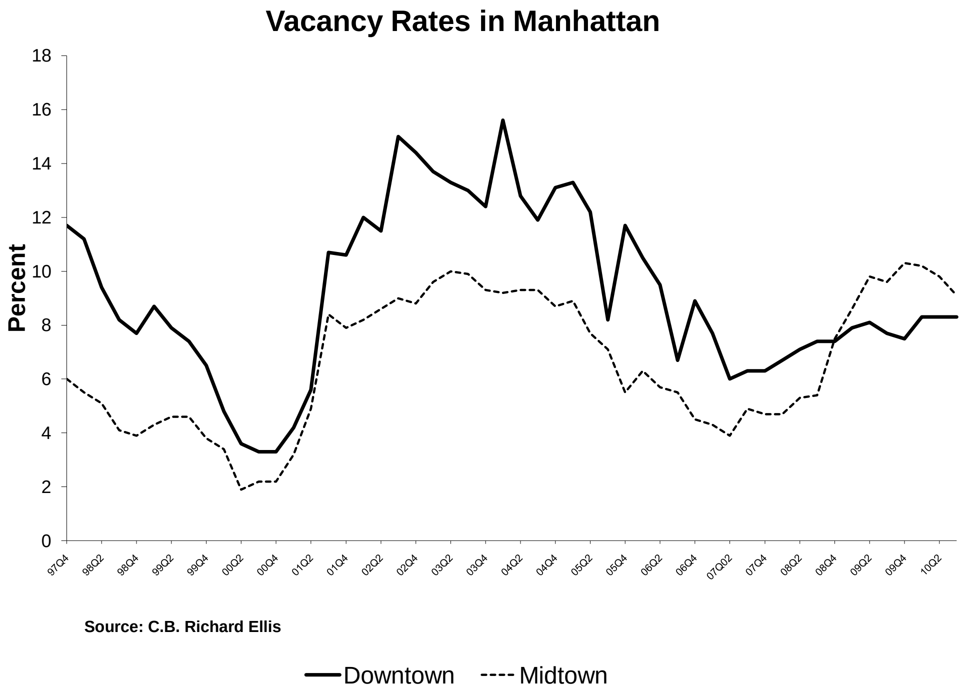
$RMSE = 16.975$

Number of Observations= 20

RETTN	Value of taxable non-mansion real estate transfers
PAHNY	Average existing single-family home price for New York State
HUSTSNY	Housing starts for New York State
VACNYC	Sum of office building vacancy rates for midtown and downtown Manhattan
D1980	Dummy variable = 1 for 1980 State fiscal year; 0 otherwise
RETTM	Mansion tax receipts
D2008	Dummy variable = 1 for 2008 State fiscal year; 0 otherwise

Note: Values in parentheses under coefficients represent standard errors.

PERCENT CHANGE IN EXOGENOUS VARIABLES STATE FISCAL YEARS 2002-03 TO 2009-10								
Exogenous Variable	**2003-04**	**2004-05**	**2005-06**	**2006-07**	**2007-08**	**2008-09**	**2009-10**	**2010-11 (est.)**
Value of sold housing (% change)	1.2	7.4	10.6	(12.6)	(0.4)	4.2	(51.8)	14.4
Sum of Manhattan vac. rates (level)	23.75	21.84	18.50	14.00	10.35	14.20	18.0	18.1
Average NY House Price '(% change)	6.0	12.3	11.2	(1.2)	(0.8)	(6.4)	(14.5)	(0.7)



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. Other factors which could impact Real Estate Transfer Tax collections include the strength of the dollar compared to other currencies, as well as the luxury housing market, especially in Manhattan.

Since the impacts of the variables are not systematic enough to be computed by the model, they must be considered idiosyncratic and vary widely during different market cycle periods.

Cash Receipts

Large irregularities in the distribution of quarterly receipts indicate the significant volatility in this series. The following table shows this percentage of collections in each quarter. The sharp drop off at the end of 2008-09 (4^{th} quarter) is noteworthy.

PERCENTAGE DISTRIBUTION OF CASH RECEIPTS				
	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
2001-02	22.7	29.2	28.1	20.0
2002-03	27.0	24.8	28.4	19.8
2003-04	21.8	24.8	27.5	25.9
2004-05	26.3	27.3	25.8	20.6
2005-06	23.9	31.3	26.3	18.5
2006-07	25.9	24.7	24.6	24.8
2007-08	25.8	29.3	23.3	21.6
2008-09	30.2	32.1	23.4	14.3
2009-10	18.5	25.8	27.9	27.8
2010-11(est.)	24.6	29.0	23.2	23.2

PARI-MUTUEL TAXES

TAX BASE AND RATE

Since 1940, the pari-mutuel tax has been levied 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).

In the 1980s, the on-track harness handle was over $850 million and the effective tax rate was over 8 percent. Currently, the on-track and simulcast handle at harness tracks is marginally less than $180 million, with an effective tax rate of 1.3 percent. Similarly, the on-track and simulcast thoroughbred handle has fallen from over $800 million to $412 million and its effective tax rate from over 9 percent to 1.4 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. The handle at OTB's has grown to $1.7 billion, and its effective tax rate was reduced from over 3 percent to 0.8 percent.

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:

- AM043 Department of Taxation and Finance. Monthly reports containing collection data.
- 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 reports containing collection data.

STATUTORY CHANGES

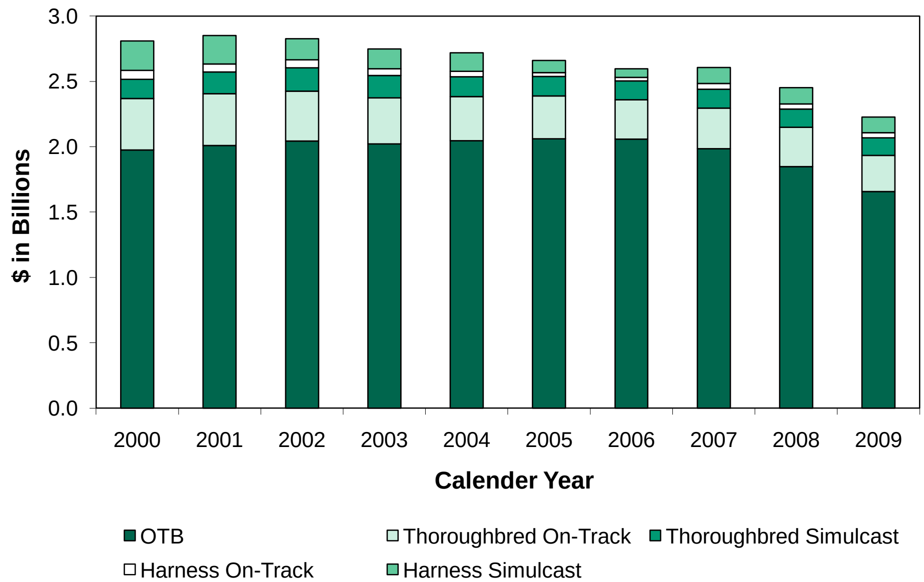
Over the last two decades, increases in OTB activity and simulcasts, which now account for nearly 75 percent of the statewide handle, have been accompanied by a corresponding decline in handle and attendance at racetracks. To encourage the continuing viability of these tracks, the State authorized higher 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. 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). It also redirected the State franchise fee on nonprofit racing associations (NYRA) to repay loans from the New York State Thoroughbred Capital Investment Fund, effective January 1, 1998. 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. Legislation enacted in 2006 expanded telephone wagering accounts to allow wagering over the Internet, and reduced tax rates on thoroughbred races.

Legislation enacted in 2008 granted NYRA a new franchise until December 31, 2037. Additional legislation enacted in 2008 provided for the State to assume operation of the New York City Off-Track Betting Corporation and increase the take-out on NYRA races.

Recent legislation extended the authorization for telephone betting, in-home simulcasting experiments, expansion of track and OTB simulcasting, and lowered the tax rates on simulcast wagering.

New York State Pari-Mutuel Handle by Source



FORECAST METHODOLOGY

The tax is a function of the kind of wager (bet), type of race, and the place where wagers are made. Several econometric studies have been performed on this revenue source. However, changes to the tax base, increased competition from new racing venues, VLTs (Video Lottery Terminals), and casino gaming have made traditional econometric estimation difficult.

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 2009, New York State tracks reported that 34 percent of the wagers were regular (bet on a single horse), 36 percent were multiple wagers (bet on two horses), and 30 percent were exotic wagers (bet on three or more horses).

The expansion of OTBs has contributed, in part, to the continuing downward trends in on-track handle and attendance. Increased simulcasting in has been a factor in off-track wagering now accounting for nearly 75 percent of the statewide handle. Accordingly, trend analysis is performed to determine growth rates for each type of handle, which are then applied separately to base year thoroughbred, harness and OTB handles. At this point, effective tax rates are applied to the forecast of handles to determine tax revenues. Given the low tax rates, a variance of $1 million in handle creates only a $10,000 variance in receipts.

Revenue History

PARI-MUTUELTAX RECEIPTS STATE FISCAL YEAR ENDING MARCH 31 (millions of dollars)										
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011 (est.)
Actual	29.6	29.5	27.5	26.0	22.6	20.8	23.6	22.3	18.8	18.0
Percent Change	1.0	(0.3)	(6.8)	(5.5)	(13.1)	(8.0)	13.5	(5.5)	(15.7)	(4.3)

Cash Receipts

As shown by the table below, pari-mutuel tax receipts are highest during the summer months of the 2nd quarter of the fiscal year.

PERCENTAGE DISTRIBUTION OF GENERAL FUND COLLECTIONS				
	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
2001-02	21.8	32.3	22.8	23.1
2002-03	23.4	32.2	23.2	21.2
2003-04	23.8	33.2	22.1	20.9
2004-05	23.5	32.2	22.7	21.6
2005-06	23.8	32.0	16.4	27.8
2006-07	25.5	34.1	19.2	21.2
2007-08	22.5	33.5	22.0	22.0
2000-09	24.7	32.7	22.0	20.6
2009-10	25.0	35.6	19.7	19.7
2010-11 (est.)	23.9	35.6	18.3	22.2

Risks to the Forecast

Competition from VLTs and other gaming venues could cause some of the OTBs to close down a number of branches, and the increased competition from other forms of gambling, such as casinos, could decrease receipts. Increased racing dates and higher quality racing resulting from purse enhancements provided by VLT revenue, along with internet wagering, could result in higher receipts.

LOTTERY

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 Lottery Commission. Under the original lottery legislation, a lotto-type game was offered with 12 drawings a year, 30 percent of gross receipts earmarked to prizes, 55 percent to education, and the remaining 15 percent representing an upper limit on administrative expenses. Since its inception, numerous games have been introduced with varying prize payout schedules to make them attractive to the consumer. In 1973, the New York State Racing and Wagering Board took over operation of the Lottery from the Lottery Commission. The New York State Division of the Lottery was established in 1976, and assumed the operation of the State's Lottery.

The Lottery Division, as an independent agency within the Department of Taxation and Finance, manages the operation and sales of the State's Lottery games. The Lottery Division is authorized to operate five types of games:

1. Instant games, sold as scratch-off tickets in which most prizes are won immediately (approximately 45 games are currently being offered for sale with prices ranging from $1 to $30);

2. Lotto games, which are pick-your-own-numbers games offering large top prizes, with drawings conducted 15 times weekly: seven 5-of-39 draws (Take-5), two 6-of-59 draws (Lotto), two 6-of-40 draws (Sweet Million), and four multi-jurisdictional drawings (Mega Millions and Power Ball). For Lotto, Mega Millions and Power Ball, top prizes are pari-mutuel and the value of any top prize not won is added to the top prize in the subsequent drawing;

3. Daily numbers games, which are fixed-odds games, with two daily drawings where players select either a three-digit number (Daily Numbers), or a four-digit number (Win 4);

4. Keno-like games, which are pari-mutuel pick-your-own 10-of-80 numbers games, with drawings conducted either daily (Pick 10) or every four minutes (Quick Draw) during certain intervals. The Lottery Division 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. Video Lottery Terminals (VLTs) are currently authorized only at selected thoroughbred and harness tracks.

The Comptroller, pursuant to an appropriation, distributes all net receipts from the lottery directly to school districts for the purpose 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.

The statutory allocation for education from Lotto and Sweet Million are 45 percent of ticket sales; from Take 5, Mega Millions, Power Ball Daily Numbers, Win 4, and Pick 10 games, 35 percent; from Quick Draw, 25 percent; and from Instant games, 20 percent with 10 percent from up to three Instant Games per year. The Lottery Division sets aside 15 percent of revenue from sales all traditional lottery games for its administration, and the remainder is available to support education. At the end of each fiscal year, any unspent portion of the 15 percent of ticket sales not used for administration is also used for education. The remaining portion of sales revenue is used to pay prizes.

ADMINISTRATION

The Lottery Division's game vendor notifies sales agents of the State's share of sales proceeds by the Monday following the liability week. The agent has until Tuesday to deposit sufficient funds in specified joint bank accounts at which time the operations vendor sweeps the funds and transfers them to the Lottery Division by Wednesday morning. For VLTs, the Division sweeps the accounts daily and the State receives the revenues daily.

DATA SOURCES

The Division of the Lottery provides data on a weekly and monthly basis.

STATUTORY CHANGES

Legislation enacted in 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, 2002, 2004, 2005, 2006 and 2008 authorized the Quick Draw game through May 31, 2010. Legislation enacted on July 1, 2010 made the Quick Draw lottery game permanent and removed the restriction on the number of hours Quick Draw can be operated.

Legislation enacted on October 29, 2001, allowed the Lottery Division to enter into a multi-jurisdictional agreement to conduct a multistate lotto games with a 50 percent prize payout. The State elected to join with the Big Game (subsequently renamed Mega Millions) states. This 2001 legislation also allowed the Lottery Division to license the operation of VLTs at selected New York State racetracks.

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

Legislation enacted on April 7, 2009, allowed the Lottery Division to enter into more than one multi-jurisdictional agreement.

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, Mega Millions and Power Ball

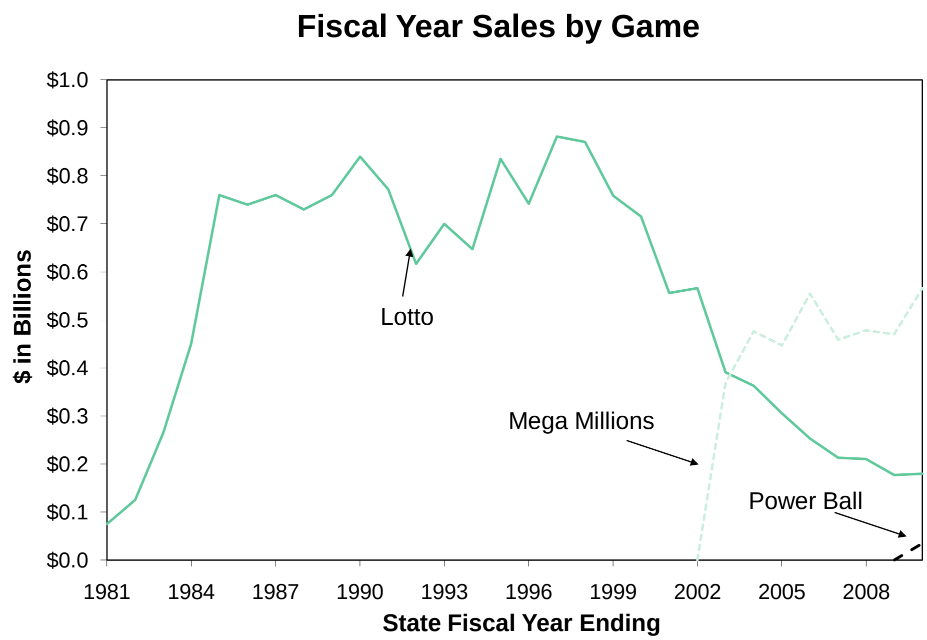
Sales of Lotto, Mega Millions and Power Ball tickets are volatile because the game jackpots can randomly "roll-up" to high amounts. High jackpots produce significant spikes in sales. The forecast of these games uses a simulation model that mimics the actual process and simulates one year of drawings. The model is run for 1,000 iterations (each iteration simulates one year of drawings) to produce output distributions for total sales, total revenue and the seeding necessary to maintain the jackpot levels. Distribution averages are used to predict the most likely receipts outcome.

The jackpot structure is input into the model and then a regression model based on historical sales-to-jackpot relationships is used to obtain an estimate of the average sales at each jackpot level, correcting for seasonal effects and other factors. After the sales for a specific draw are calculated, another model predicts the average 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, a random number generator is used 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 jackpot level and the model repeats the analysis.

The model simulates 104 jackpot draws and thus one full year of results. Since the sales and coverage ratio are not the same every time a given jackpot level is drawn, the average sales and coverage ratio predicted by the regression equations cannot simply be used. Instead, a risk analysis program is used to substitute a probability distribution for sales at each jackpot level and the program randomly selects a value from among the distribution to pick the actual sales at every given jackpot level. The probability distributions are based upon the historical variance in sales at various jackpot levels. To illustrate, sales of Lotto at a $3 million jackpot level may range between $2.5 million and $4.5 million, with an average of $3.5 million. The $3.5 million would be established using the regression equation and it can be postulated that the actual sales will vary according to a normal distribution with a mean of $3.5 million and a variance of $350,000. The risk analysis would randomly select the actual sales level from the distribution. The next time a $3 million jackpot is encountered, a different sales level would be selected which would produce a different coverage ratio. The model employs thousands of such distributions.

Performing the simulation 1,000 times essentially creates 1,000 potential years of results. This allows for the creation of distributions of possible results and evaluation of the probability of achieving a given level of sales. The model also contains features that allow the simulation of potential policy changes or other events that could affect sales, such as the impact of Mega Millions and Power Ball on Lotto, 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 are collected weekly and the model produces weekly estimates for the balance of the fiscal year. There is one exogenous variable: disposable income. In addition, a trend variable and dummy variables to capture the impact of the seasonality of sales and the introduction of 75 percent games are included. The equation is corrected for autocorrelation in the error term.

Dependent Variable

- Current weekly sales of all Instant Games.

New York Disposable Income

- This variable is a quarterly measure of disposable income in New York. It is used as a proxy for changes in the amount of income that lottery customers have available to spend on instant games.

75 Percent Games Dummy

- On October 27, 2001, the Lottery Division launched a 75 percent Instant Game and experienced significant growth in sales. The Lottery Division has offered three 75 percent Instant Games each fiscal year since 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 thereafter.

Seasonal Dummy

- Equal to the average percent of total sales for the year received during that week of the year.

Trend

- This variable is a linear trend and serves as a proxy for unobserved factors that are highly correlated with the dependant variable through time.

Trend2

- This variable is a linear trend and serves as a proxy for unobserved factors that are highly correlated with a change in the trend growth of the dependant variable beginning in 2007.

INSTANT GAME - MULTI VARIANT REGRESSION EQUATION

$$\underset{}{\textit{Instant Game Sales per Week}_t} = \underset{(3.7)}{30.32}* \textit{New York Disposable Income}_t + \underset{(39.4)}{174.7}* \textit{75 Percent Instant Games Dummy}_t +$$

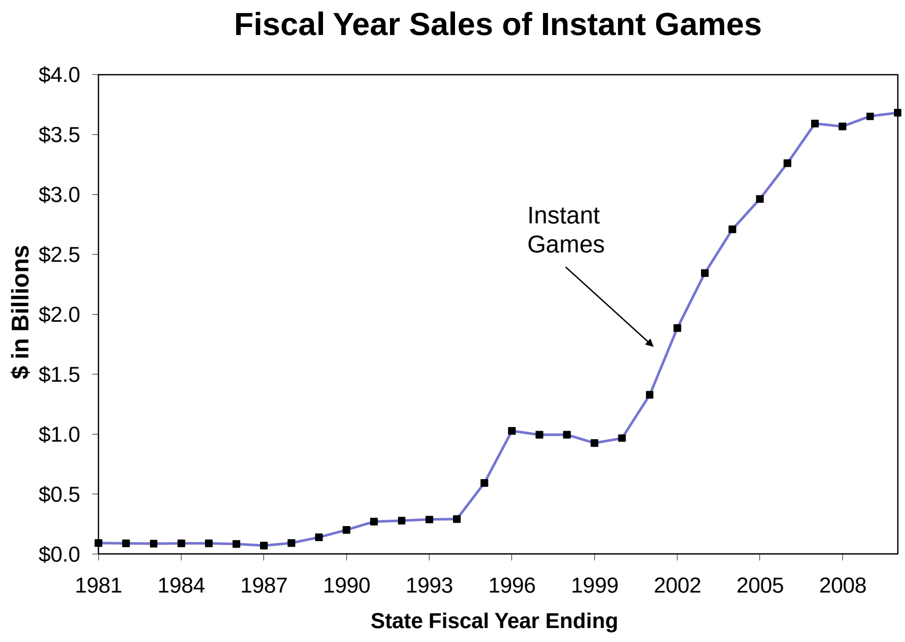
$$\underset{(31.4)}{323.5}* \textit{Seasonal Dummy}_t + \underset{(8.4)}{67.1}* \textit{Trend}_t - \underset{(16.5)}{82.8} * \textit{Trend2}_t$$

Adjusted R Square= .997

Root Mean Squared Error=3,126

Number of Observations=738

Note: Values in parentheses under coefficients represent standard errors.



Quick Draw

Quick Draw sales are estimated using a multi-variant regression equation with three independent variables: a trend variable, a seasonal dummy variable, and a dummy variable for the "Quick Draw Extra" initiative. The equation is corrected for autocorrelation in the error term.

Dependent Variable

- Weekly Quick Draw sales.

Seasonal Dummy

- Equal to the average percent of total sales for the year received during that week of the year.

Trend

- This variable is a linear trend and serves as a proxy for unobserved factors that are highly correlated with the dependant variable through time.

Quick Draw Extra

- This is a dummy variable that represents a game enhancement employing on-premise promotions involving bonus payouts. The dummy variable is zero prior to and including November 10, 2000, and is one thereafter.

QUICK DRAW - MULTI VARIANT REGRESSION EQUATION

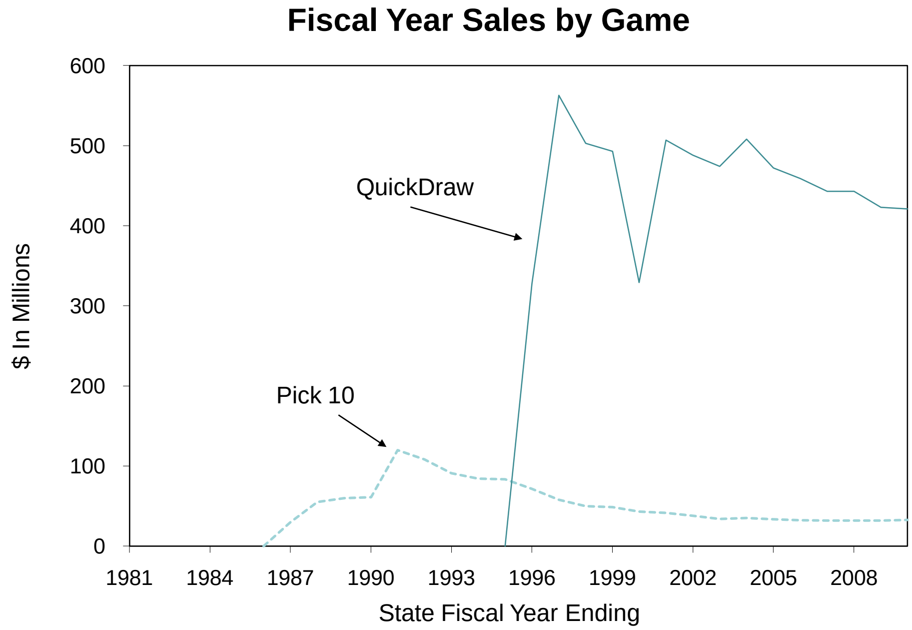
$$\textit{Quick Draw Sales per Week}_t = \underset{(78.7)}{10{,}262} + \underset{(3.9)}{73.6} * \textit{Seasonal}_t - \underset{(0.2)}{4.41} * \textit{Trend}_t \; \underset{(90.6)}{890.8} * \textit{Quick Draw Extra}_t$$

Adjusted R Square=.60

Root Mean Squared Error=614

Number of Observations=567

Note: Values in parentheses under coefficients represent standard errors.



Win 4

A multi-variant regression procedure is used to estimate Win 4 game sales. There are four independent variables: trend, a dummy variable representing the number of draws each day, a dummy variable representing bonus weeks, and a dummy variable representing a seasonal pattern. The equation is corrected for autocorrelation in the error term.

Dependent Variable

- This variable represents current weekly Win 4 sales.

Trend

- This variable is a linear trend and serves as a proxy for unobserved factors that are highly correlated with the dependant variable through time.

Draws Per Day

- A dummy variable reflecting the number of Win 4 draws per day. On December 2, 2001, the Lottery Division launched a second daily draw, a noon draw for the Numbers and the Win 4 games. 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 weeks for this game. The dummy variable is zero in every week before and after scheduled bonus weeks, and is one during the bonus weeks.

Seasonal Dummy

- Equal to the average percent of total sales for the year received during that week of the year.

WIN 4 - MULTI VARIANT REGRESSION EQUATION
$\textit{Win 4 Sales per Week} = \underset{(216.3)}{5{,}190} + \underset{(0.4)}{8.1} * \textit{Trend}_t + \underset{(129.8)}{945.4} * \textit{Draws Per Day}_t + \underset{(62.4)}{253.8} * \textit{Bonus Week}_t + \underset{(4.2)}{79.7} * \textit{Seasonal Dummy}$
Adjusted R Square=.983
Root Mean Squared Error=322
Number of Observations=812

Note: Values in parentheses under coefficients represent standard errors.

Daily Numbers Game

Daily Numbers sales are estimated by employing a multi-variant regression equation. There are four independent variables: the number of draws per day, a trend and a dummy variable representing bonus weeks, and a dummy variable representing a seasonal pattern. The equation is corrected for autocorrelation in the error term.

Dependent Variable

- This variable represents current weekly Daily Numbers sales.

Trend

- This variable serves as a proxy for unobserved factors that are highly correlated with the dependant variable through time.

Draws Per Day

- This dummy variable reflects the number of Daily Number draws per day. On December 2, 2001, the Lottery Division launched a second daily draw, a noon draw, for the Numbers and the Win 4 games. The dummy variable is zero prior to and including November 24, 2001, and one thereafter.

Bonus Week

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

Seasonal Dummy

- Equal to the average percent of total sales for the year received during that week of the year.

DAILY NUMBERS - MULTI VARIANT REGRESSION EQUATION

$$\mathit{Daily\ Numbers\ Sales\ per\ Week}_t = \underset{(308.9)}{11{,}474} + \underset{(0.5)}{3.9} * \mathit{Trend}_t \ \underset{(212.4)}{689.0} * \mathit{Draws\ Per\ Day}_t + \underset{(71.2)}{355.2} * \mathit{Bonus\ Week}_t + \underset{(5.4)}{101.9} * \mathit{Seasonal\ Dummy}_t$$

Adjusted R Square=.920

Root Mean Squared Error=420

Number of Observations=812

Note: Values in parentheses under coefficients represent standard errors.

Take 5

Take 5 sales are estimated using a multi-variant regression equation. There are three independent variables: a variable reflecting the number of draws offered each week, a dummy variable reflecting the additional advertising support for Take 5, and a dummy variable representing competition from the Power Ball game. Essentially, these three special events explain most of the change in Take 5 sales. The equation is corrected for autocorrelation in the error term.

Dependent Variable

- This variable represents current weekly Take 5 sales.

Trend

- This variable serves as proxy for unobserved factors that are highly correlated with the dependant variable through time.

Draws Per Week

- This dummy variable represents the number 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 January 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, changed to two to reflect an additional draw per week until January 6, 1997, when it is changed to four, and has been seven since September 1, 2000, to represent seven draws per week.

Advertising Dummy

- This dummy variable represents the impact of the Division of the Lottery's advertising campaign for Take 5. The dummy variable is zero prior to and including the week of January 30, 2008, and one thereafter.

Power Ball Dummy

- This dummy variable represents the impact of the introduction of the Power Ball game on Take 5. The dummy variable is zero prior to and including the week of January 31, 2009, and one thereafter.
-

TAKE 5 - MULTI VARIANT REGRESSION EQUATION

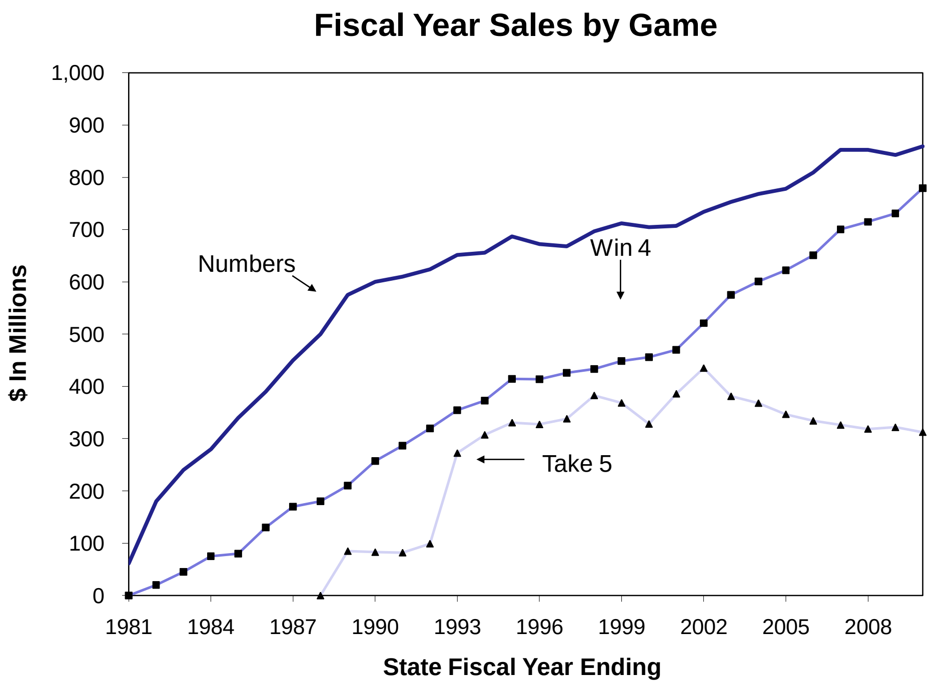
$$\underset{}{\textit{Take 5 Sales per Week}} = \underset{(213.0)}{6{,}478} - \underset{(0.5)}{6.75} * \textit{Trend}_t + \underset{(42.3)}{739.3} * \textit{Draws Per Week}_t + \underset{(145.2)}{833.0} * \textit{Advertising Dummy}_t - \underset{(158.1)}{242.6} * \textit{Power Ball Dummy}_t$$

Adjusted R Square=.89

Root Mean Squared Error=284

Number of Observations=813

Note: Values in parentheses under coefficients represent standard errors.



Receipts History

The following tables provide a history of receipts for education from Lottery and a history of sales of Lottery games.

TRADITIONAL LOTTERY RECEIPTS FOR EDUCATION
STATE FISCAL YEAR ENDING MARCH 31
(millions of dollars)

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011 (est)
Actual Receipts	1,552	1,789	1,884	1,889	2,018	2,039	2,117	2,082	2,152	2,085
Percent Change	8.2	15.3	5.3	0.3	6.8	1.1	3.8	(1.7)	6.5	(3.1)

LOTTERY SALES OF TRADITIONAL GAMES STATE FISCAL YEAR ENDING MARCH 31 (millions of dollars)	2002	2003	2004	2005	2006	2007	2008	2009	2010
Numbers	734	753	754	788	819	848	848	848	860
Win 4	521	577	599	622	655	696	715	736	779
Instant	1,886	2,346	2,801	2,961	3,262	3,592	3,569	3,652	3,683
Lotto	566	391	361	305	253	213	210	177	180
Mega Millions	0	369	420	447	555	459	478	470	566
Power Ball	0	0	0	0	0	0	0	0	34
Quick Draw	488	474	500	472	459	443	443	423	421
Take 5	435	381	368	347	334	326	319	328	312
All Other	37	49	40	46	64	67	58	40	69
Total	4,667	5,340	5,843	5,988	6,401	6,644	6,635	6,674	6,904

Cash Receipts

Cash receipts are generally evenly distributed between quarters, except that fourth quarter receipts are higher due to the transfer of any administrative surplus to the education account at the end of the fiscal year. Irregularities occur due to the random nature of payouts associated with the Lotto and Mega Millions games and the timing of the introduction of new instant games.

Collection Components (millions of dollars)

PERCENTAGE DISTRIBUTION OF CASH RECEIPTS	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
2001-02	18.8	30.5	18.3	32.4
2002-03	19.4	20.0	19.9	40.7
2003-04	20.7	19.0	19.4	40.9
2004-05	20.2	19.6	19.7	40.5
2005-06	21.3	20.1	20.6	38.1
2006-07	20.6	18.4	19.3	38.1
2007-08	20.6	19.9	19.3	40.2
2008-09	21.3	19.6	22.5	36.7
2009-10	20.8	21.9	19.7	37.6
2010-11 (est)	22.3	19.4	20.4	37.9

Risks to the Forecast

Lower Instant Games sales may occur due to economic constraints experienced by consumers. The Mega Millions and Power Ball games may achieve lower sales than forecasted if the number of large jackpots is less than expected. Competition from other gaming venues may also reduce Lottery sales.

VIDEO LOTTERY

BACKGROUND

Chapter 383, 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

Legislation enacted in 2008 altered the distribution of VLT receipts after payment of prizes. Legislation enacted in 2010 reduced the vendor's commission by one percent at each track. As shown in the table on the following page, the different distributions for racetracks are based on factors that include: size of the facility; population surrounding the facility; and proximity to Native American and out-of-state casinos.

In addition, any amount not spent by the Division of the Lottery for administrative expenses is also earmarked for education. The Comptroller, pursuant to an appropriation, distributes all net receipts from the lottery for the purposes of providing education aid.

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 are 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. Additional 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, vendor racetracks receive 29 percent, and 61 percent is dedicated to education.

- Of the 29 percent commission paid to racetracks, the amount allocated to horse racing purses in years one through three was 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 vendor racetracks, the harness and thoroughbred Breeders' funds received 4.3 percent in years one through five and 5.2 percent in all subsequent years.

CURRENT DISTRIBUTION OF VLT RECEIPTS AFTER PRIZES*
(Percent)

Tracks with 1,100 or more machines (*Saratoga, Finger Lakes*)

Net Machine Income	Education	Lottery Administration	Commission	Marketing	Capital
Up to $62.5 million	45	10	31	10	4
More than $62.5 million up to $100 Million	49	10	31	10	0
Over $100 million	51	10	31	8	0

Tracks with less than 1,100 machines (*Batavia*)

Net Machine Income	Education	Lottery Administration	Commission	Marketing	Capital
Up to $50 million	41	10	35	10	4
More than $50 million to $62.5 million	48	10	28	10	4
More than $62.5 million up to $100 Million	52	10	28	10	0
More than $100 million up to $150 Million	54	10	28	8	0
Over $150 million	57	10	25	8	0

Tracks with a population less than 1 million within 40 mile radius (*Tioga*)

Net Machine Income	Education	Lottery Administration	Commission	Marketing	Capital
Up to $50 million	37	10	39	10	4
More than $50 million to $62.5 million	48	10	28	10	4
More than $62.5 million up to $100 Million	52	10	28	10	0
More than $100 million up to $150 Million	54	10	28	8	0
Over $150 million	57	10	25	8	0

Tracks within 15 miles of a Class III Native American Casino (*Vernon, Buffalo Fairgrounds*)

Net Machine Income	Education	Lottery Administration	Commission	Marketing	Capital
Up to $62.5 million	35	10	41	10	4
More than $62.5 million to $100 million	39	10	41	10	0
Over $100 million	41	10	41	8	0

Tracks Located in Sullivan County within 60 miles of Gaming Facility in a Contiguous State (*Monticello*)

Net Machine Income	Education	Lottery Administration	Commission	Marketing	Capital
Up to $100 million	39	10	41	10	0
Over $100 million	41	10	41	8	0

Tracks with 1,100 or more machines located in Westchester County (*Yonkers*)

Net Machine Income	Education	Lottery Administration	Commission	Marketing	Capital
Up to $62.5 million	48	10	30	8	4
Over $62.5 million	52	10	30	8	0

Aqueduct Racetrack

Net Machine Income	Education	Lottery Administration	Commission	Marketing	Racing Support Payment
All Net Machine Income	44	10	31	8	7

*Not less than 90 percent of sales must be used for prizes.
Net Machine Income is gross receipts minus prize payments. For tracks participating in the subsidized free-play pilot program, free-play is excluded from the calculation of NMI.

- 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. The program expires after ten years.

Legislation enacted on April 12, 2005, revised the distribution of VLT receipts, providing:

- A graduated vendor's fee that allows participating tracks to receive 32 percent of the first $50 million of revenue after prizes, 29 percent of the next $100 million, and 26 percent of net revenue over $150 million.

- A marketing allowance of 8 percent of the first $100 million of net revenue and 5 percent thereafter. The marketing allowance is limited to 4 percent of net revenue for tracks located in Westchester or Queens counties.

- An extension of the program's expiration until December 31, 2017.

- The statutory allocations to purses and breeders funds were eliminated.

Legislation enacted on February 19, 2008, further revised the distribution of VLT receipts to provide different commissions to tracks based on factors including: size of the facility; population surrounding the facility; and proximity to Native American and out-of-state casinos. The legislation also provided tracks with a capital allowance for capital expenditures to enhance the facilities.

Legislation enacted July 7, 2008, provided a commission rate of 75 percent to a facility located in Sullivan County that has made a capital investment of at least one billion dollars and has no fewer than 2,000 full-time, permanent employees. However, the qualifying facility is required to provide a minimum contribution to education of $38 million plus an amount equal to the Lottery's administrative costs, not to exceed 7 percent of net machine income.

Legislation enacted August 11, 2009, reduced the capital investment to $600 million and the employment requirement to 1,000 full-time, permanent employees for a facility located in Sullivan County to receive a higher commission rate.

Legislation enacted August 11, 2010, increased the number of hours per day that VLTs may be operated to 20 hours from 16 hours, and reduced the vendor's commission by one percent.

FORECAST METHODOLOGY

The forecasting methodology used by the Division of the Budget relies on a complex simulation model to forecast potential revenues from all facilities that either are in existence or are expected to begin operation during the forecast period. The methodology is modified after a specific facility has operated long enough to produce a sufficient number of observations. At this point, actual operating experience is used to recalibrate the model.

1. Forecast Methodology for Potential Gaming Facilities

Current simulation estimates are based on an approach flexible enough to respond to a rapidly changing policy environment. The Budget Division has adopted a modeling strategy capable of evaluating the impacts of competition, alternative facility locations, varying numbers of facilities, and alternative plans for program expansion. This effort has required the development of a computer-based simulation model combining demographic, Geographical Information Systems (GIS), and marketing assumptions. The purpose of the model is to simulate gambling behavior at the census tract level, resulting in an assessment of the underlying market for VLTs by facility over a multi-year forecast horizon.

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:

- An average prize payout of 92 percent over the period of analysis.
- All facilities will operate for 365 days per year after they begin operations.
- All facilities will continue their current hours of operation.
- All facilities operate the expected number of machines.
- Marketing, advertising, food and beverage, entertainment, availability of free-play, and the facilities' quality of experience are competitive.
- All facilities complete their currently anticipated expansion plans.
- All facilities qualifying for the VLT program begin operations at an estimated start date 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

Estimating revenues for an existing facility located in New York requires an assessment of the facility's capacity to attract participants, adjusting for the impact of potential competitors. Since most studies assume that a VLT facility's market can range as far as 150 miles, the market area for New York State facilities outside the New York metropolitan area includes any competing facility within either 150 miles or 150 minutes travel time of a State-run facility. This leads to a definition of New York's market area that includes nine northeastern states — Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, Pennsylvania, Rhode Island, Vermont, and New York — and eastern Canada. The latitude and longitude of all current and proposed facilities in this area and of the more than 13,000 census tracts are key inputs of the DOB model. The model assumes U.S. citizens may patronize Canadian facilities, but that Canadians do not patronize U.S. facilities. This last condition is the result of the unavailability of comparable Canadian data.

An evaluation of the market potential for video lottery terminals and slot machines in New York requires an assessment of four critical market characteristics:

1. The number of potential participants living in the New York market area.

2. The frequency with which participants visit a casino or VLT facility.

3. The amount spent per visit to a facility.

4. The selection of several potential facilities that a participant will visit.

Number of Participants

Estimating the potential number of participants begins with a national demographic profile of people who typically patronize casinos. The primary source of this data is gambling industry trade publications. These data indicate the percentage of potential gamblers for four demographic characteristics: age, income, gender, and education. The same data also give an aggregate participation rate for each state. To account for differences among the states' participation rates, national rates for each demographic variable are adjusted to reflect the state-specific participation rate. Using the adjusted data, the number of participants are estimated by applying state-specific participation rates to each of the four demographic characteristics for each census tract in the nine-state study area. This provides an indication by census tract of how many people in the nine-state market area are likely to visit a casino or VLT facility.

To arrive at a multi-year monthly forecast, each of the four demographic characteristics and participation rates are projected by month and census tract to March 2015. The appropriate monthly participation rate is applied 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. An unweighted average of the four estimates is used to arrive at a final estimate. The estimated participation rates of some fully mature states, such as New Jersey and Connecticut, are increased modestly over the projection period. This provides an estimate of the number of gamblers in each census tract by month through March 2015.

The available data contain estimates of participation rates only for people over 21. In New York, persons 18 and older can visit VLT facilities. To adjust for this, Census 2000 population estimates are used, with the participation rate from the next higher age bracket applied to estimate the number of participants in the 18 to 20 age bracket.

Applying this calculation to New York shows New York's population aged 21 years or older to be 13.5 million, with an estimated participation rate of 27 percent in 2004. 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, suggesting that additional participants are encouraged by access to casino venues. Therefore, it is assumed that as more casino facilities become available over time, 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	40
Maine	12
Massachusetts	31
New Hampshire	20
New Jersey	36
New York	27
Pennsylvania	21
Rhode Island	36
Vermont	9

* Source: "Profile of the American Casino Gambler." Harrah's Survey 2004

The Harrah's Survey 2006 Profile of the American Casino Gambler cites New York City as already having a 33 percent participation rate and further notes the New York Metro region as the number 1 "feeder" market for casino trips.

Number of Visits

To estimate the frequency of visits, two approaches are combined. First, several published studies indicate that the closer an individual lives to a casino, the more frequent the visits. 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), three times per year. The American Gaming Association survey found that nationally the average casino player visits a casino 6.1 times per year. In the Northeast region, the average casino player visits 8.5 times per year. Again, the Profile gives the average number of visits by state; it appears that the number of visits increases in states with higher participation rates. The analysis has been calibrated using both studies, and the results from both approaches are relatively close. The number of visits is estimated monthly by census tract as population and participation rates rise over time, and are combined to produce a final forecast.

Amount Gambled

To determine the amount of income spent per visit, two studies were used. Oregon completed a study that indicated that the average person would gamble approximately 1.16 percent of annual income on all forms of gaming. On the other hand, KPMG, in its study of gambling in Michigan, postulated that people in the primary market area would be willing to lose $40 each time they visited a casino, in the secondary market area $50 each time, and in the tertiary market area $65 each time. To derive the amount of gambling dollars using the KPMG methodology, the loss per visit was increased or decreased by indexing these amounts by the ratio of the per capita income of each census tract to the per capita income in Michigan. To grow the amount gambled in each census tract, personal income and population were increased by the growth rate between the

1990 and 2000 census. This allowed for growth in the amount gambled in the primary, secondary, and tertiary market areas by month through 2015. This also allowed calculation of the total amount of gambling dollars in each census tract by multiplying personal income by the Oregon average percentage of income gambled. Somewhat surprisingly, these two methodologies produced similar results. The amount gambled in each census tract is forecast monthly to 2015 as a function of the growth in population, income, and participation rates.

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 the potential venues. There are several existing facilities in New York, the surrounding states and Canada, and over the next five years, new facilities may open, such as the new facility planned at the Aqueduct Racetrack. Each facility will compete for potential VLT players and gaming dollars. While the number of players and the amount of gaming dollars is projected to grow over time, in the short run they are relatively fixed. The introduction of a new facility anywhere in the nine-state-area will reduce the players and gaming dollars to surrounding facilities. The following describes two methods for determining the distribution of potential VLT customers and revenue among all the competing facilities.

Concentric Rings

One method to establish a facility's market area begins with the industry accepted norms. The primary, secondary and tertiary markets are set at 0 to 50 miles, 50 to 100 miles, and 100 to 150 miles, respectively. This produces three concentric rings around each facility. The arc distance is calculated 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 the actual location of the facility is unknown, a geographically logical location within the appropriate municipality or region is assumed. It is then determined whether a given census tract falls within the primary, secondary or tertiary market area of another facility. The attractiveness factor is used to adjust the facility's primary, secondary, and tertiary market area to reflect its relative drawing power.

Most census tracts fall into the market areas of several facilities. To allocate the visits (and the potential revenue from each census tract) to each facility, the probability that the participants in a census tract would visit each casino is calculated. To determine the probability that an individual would visit a casino, a gravity model approach is used, 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 facility's attractiveness. This is a standard approach in location theory and is used widely by those in the gaming industry. For each census tract, the number of visits and gambling dollars for each facility are calculated using probabilities similar to those shown in the following table. The table below indicates how a representative gambler of any given census tract might divide his time under seven possible scenarios. For example, the first scenario indicates that the gambler lives in the primary market area of only a single facility. Therefore, 100 percent of his gambling will take place at that facility. Under scenario four, the gambler lives in the primary market area of one facility, the secondary area of a second facility, and the tertiary market area of a third, and divides his gambling visits according to the probabilities listed in the table. Of course, many other, more complex scenarios are possible. For example, if an individual was within the primary market of one facility and in the secondary market of two facilities, they would allocate their visits 88 percent to the primary facility and 11.8 percent to each of the secondary facilities (see primary secondary in the following table). This would add to 111.8 percent. Obviously this is impossible, so each percentage is divided by 111.8 percent to arrive at 78.9 percent for the primary facility and 10.55 percent to each secondary facility.

SAMPLE PROBABILITIES OF VISITING A CASINO (percent)

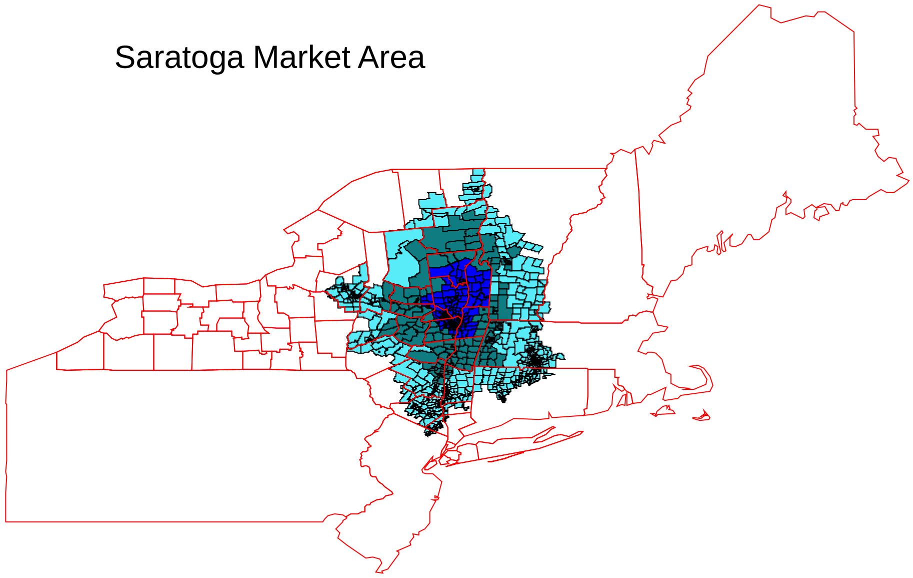
	Primary	Primary Secondary	Primary Tertiary	Primary Secondary Tertiary	Secondary	Secondary Tertiary	Tertiary
Primary	100.0	88.2	96.1	85.2			
Secondary		11.8		11.4	100.0	76.8	
Tertiary			3.9	3.5		23.3	100.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Travel Time

The most accurate method to establish a facility's market area considers travel times. Here the model assumes that people are more responsive to the time it takes to travel to a facility than the straight line distance between their home and the facility. Again, following the norms in other studies, the primary, secondary and tertiary market areas were established using travel times of 0 to 50 minutes, 51 to 100 minutes and 101 to 150 minutes, respectively. Assuming an average speed of 50 miles per hour and allowing 15 minutes to get to a major highway from a home and another 15 minutes to get from a major highway to the facility make these market areas are comparable in size to the concentric ring model. In this case, however, the market areas 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. As already discussed, the size of the primary, secondary, and tertiary market areas is adjusted to reflect the attractiveness of facilities. The process for allocating visits and gambling dollars is identical to the concentric rings analysis (See table above). The preferred DOB model uses market areas defined by travel times in its simulations.

The following map shows an example of the market surrounding the Saratoga facility. The dark region is the primary market area. The medium-gray region represents the secondary area. The light region represents the tertiary market area.

Saratoga Market Area



Facility Limits

The model produces estimates of the number of participants, the number of visits, and total gaming revenue spent at each facility. However, other factors limit usage. The industry standard assumption is that a participant will spend three hours at a VLT per visit. In New York, the hours of operation are limited to 20 hours per day. This implies that each machine can accommodate 6.66 players per day. For example, if a facility operated for the maximum number of hours and had 2,000 machines, the maximum number of average duration visits the facility could accommodate is 13,320 per day. If the model results indicate that a facility market area would only support 6,660 visits per day, half of the machines would stand idle on average. Likewise, if the facility's market area produces 26,640 visits per day, the waiting time to use machines would be significant and the revenue-generating capacity of the facility would be capped by its physical limits regardless of how many visitors the market produces.

Overall, industry experts estimate optimal average facility utilization at 80 percent. Looking at the facility limitations above, these two parameters were combined and a sliding scale was created, which compares the number of visits that the facility's market area will produce and adjusts the facility's utilization factor to account for expected market demand. This allows the identification of areas of market saturation and areas with the greatest potential for expansion. In addition, the maximum revenue generation capacity of each facility is estimated and no facility is allowed to generate more than its maximum regardless of market predictions.

Other Factors

Since the object of the model is to produce estimates of State fiscal year revenues, it is necessary to be sensitive to the actual period of operation during each fiscal year and to the competitive effects of other facilities. For the tracks, the most recent information available from the Lottery Division is used to specify expected start dates and the initial number of machines, expansion of existing facilities, and changes in machine counts. The model also has 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 competitive impact of the recently authorized Native American casinos on the State's VLT facilities and visa versa, start dates and the number of terminals at each anticipated facility are assumed. At this time, however, the start dates, the number of machines and other parameters for the new Native American casinos are highly speculative, but to avoid over-estimating revenues from VLT facilities this factor must be considered.

Simulation Model Aggregate Results

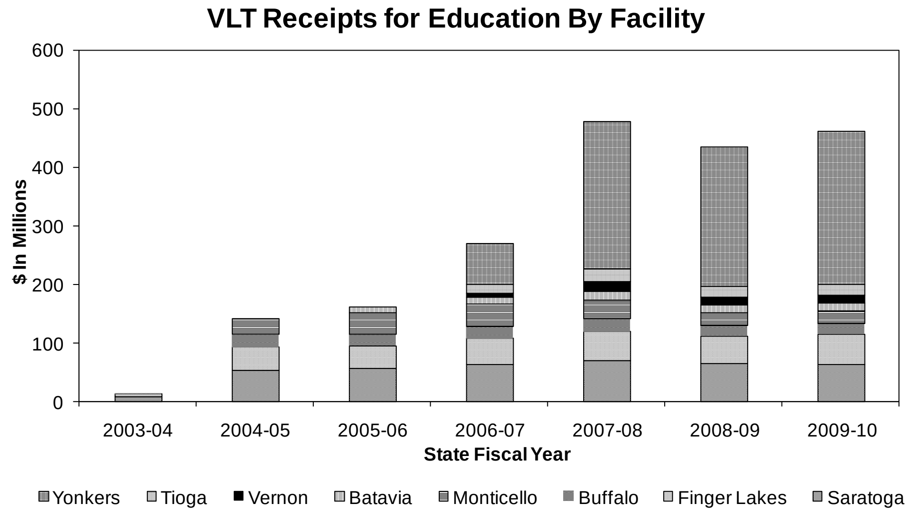
Aggregate results for this model depend upon the combination of gaming facilities open during a particular fiscal year and other factors such as start dates, quantity of VLTs or slots offered, additional amenities, and several other situational gaming factors. Given an almost infinite number of different scenarios, estimated results of the quantity of gamblers, total net machine income, and total visits can be illustrated in a low to high range. The higher numbers in the range assume a more mature gaming market in year 2011, when New York State's gaming participation has attained levels comparable to adjacent states.

2. Forecast Methodology Subsequent to the Opening of a VLT or Casino Facility

The factors effecting receipts for existing facilities are not unlike that for potential facilities. In addition to the assumptions concerning the market area, number of participants, number of visits and amount gambled, data on marketing and promotions can be included in the analysis.

After a facility has been opened long enough to compile a historic data series, the simulation model is calibrated to approximate the attractiveness factor. Historical data on each facility's net machine income trends can now be incorporated into the forecast. Consideration is also given to expansion and improvements to facilities as well as competition from other gaming venues.

Currently, there are eight VLT facilities in operation: Saratoga Gaming and Raceway, Finger Lakes Gaming and Racetrack, Fairgrounds Gaming and Raceway at Buffalo, Mighty M Gaming at Monticello, Yonkers Raceway, Tioga Downs, Batavia Downs, and Vernon Downs. It is currently anticipated that the Aqueduct facility will open in 2011.



This methodology will continue to evolve as greater experience is gained. As additional information on revenue collections become available, econometric equations are being developed for each VLT facility to assist in the estimations. Possible independent variables that may be used include: trend changes in net machine income; seasonal trends; population trends within the facility's market areas, income forecast for the potential gamblers, and promotional spending.

Revenue History

VIDEO LOTTERY RECEIPTS STATE FISCAL YEAR ENDING MARCH 31 (millions of dollars)								
	2004	2005	2006	2007	2008	2009	2010	2011 (est.)
Actual	12.6	141.2	161.7	269.7	490.8	462.3	492.5	920
Percent Change	100	1,020	14.5	66.8	82	-5.8	6.5	86.8

Cash Receipts

Net machine income at VLT facilities are generally higher during the first and second quarters of the State fiscal year. However, fourth quarter receipts are higher due to the transfer of any administrative surplus to the education account at the end of the year. The distribution for any given year may vary due to the opening of new facilities during the year or from the receipt of one-time payments.

PERCENTAGE DISTRIBUTION OF GENERAL FUND COLLECTIONS				
	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
2003-04	0.0	0.0	0.8	99.2
2004-05	19.6	29.2	24.4	26.8
2005-06	28.4	30.1	14.5	27.0
2006-07	16.6	19.7	27.1	36.6
2007-08	22.3	25.7	23.3	28.6
2000-09	24.4	25.4	21.3	29.9
2009-10	23.6	24.3	21.1	31.0
2010-11 (est.)	13.7	55.8	14.1	16.3

Risks to the Forecast

Clearly, the estimation process is highly dependent on a myriad of assumptions. Casinos compete by increasing the amount paid out in prizes. Payouts of not less than 90 percent are assumed, 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.

Pennsylvania is currently implementing legislation allowing up to 61,000 slot machines to operate in the state, with the first facilities having opened in late 2006, and compete with New York facilities. To date, nine Pennsylvania facilities have opened, with a total of 25,243 machines. New facilities are scheduled to open through the forecast period, and there are expansion plans for existing facilities. In addition, Pennsylvania recently began offering table games at their casinos. The impact of the Pennsylvania competition may end up having a greater impact on New York's facilities than is currently projected.

In addition, the estimate assumes no additional facilities will be built in New York State's market. However, there are discussions about authorizing slot machines and casino gaming in other neighboring states, 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.

MOBILITY TAX

BACKGROUND

TAX BASE AND RATE

Article 23 of the Tax Law imposes the metropolitan commuter transportation mobility tax on certain employers and self-employed individuals engaging in business within the Metropolitan Commuter Transportation District (MCTD). The MCTD consists of New York City and the counties of Dutchess, Nassau, Orange, Putnam, Rockland, Suffolk, and Westchester. Article 23 applies to:

- employers (other than public school districts) beginning on or after March 1, 2009;
- employers that are public school districts within the MCTD beginning on or after September 1, 2009; and
- self-employed individuals for tax years beginning on or after January 1, 2009.

The mobility tax is imposed at a rate of 0.34 percent of an employer's payroll expense for all covered employees for each calendar quarter. For individuals with net earnings from self-employment, the tax is 0.34 percent of the net earnings from self-employment allocated to the MCTD for the tax year. For the 2009 tax year, the individual's mobility tax liability was computed using ten-twelfths of the total net earnings from self-employment allocated to the MCTD.

Exemptions: an employer that is an agency or instrumentality of the United States, the United Nations, or an interstate agency or public corporation created under an agreement or compact with another state or Canada is not subject to the mobility tax. (For example, the Port Authority of New York and New Jersey is exempt.)

Credits: no tax credit may be used to reduce the amount of mobility tax due.

No mobility tax is due from: employers with a quarterly payroll of $2,500 or less; individuals with net earnings from self-employment allocated to the MCTD of $10,000 or less for a tax year; and the non-wage portion of S corporation member income.

ADMINISTRATION

Employers who are required to enroll in the PrompTax program for New York State withholding tax purposes are required to make payments of the mobility tax on the same dates the withholding tax payments are made under the PrompTax program. A special rule applied for 2009, with the first mobility tax payment due on the same date that the first PrompTax withholding tax payment was due on or after October 31, 2009.

Other employers are required to report and pay mobility tax due for each calendar quarter by the last day of the month following the end of the quarter. Thus, payments are due on April 30, July 31, October 31 and January 31, with a delay to the following business day if the normal due date falls on a Saturday, Sunday or legal holiday. A special rule applied for 2009, with the first payment due on November 2, 2009, covering the period March 1, 2009, through September 30, 2009.

For individuals with net earnings from self-employment, estimated tax payments must be made and are due 30 to 31 days after the end of the calendar quarter, on April 30, July 31, and October 31 of the current year and January 31 of the following calendar year. If an individual was subject to the mobility tax for 2009, the initial estimated tax payment was due by November 2, 2009, for the period ending September 30, 2009. Individuals with net earnings from self-employment must file a reconciliation return on or before the 30th day of the fourth month following the close of the tax year. The mobility tax reconciliation return must indicate the actual amount of the mobility tax due for the tax year and the estimated payments made during the year. Any additional mobility tax due must be remitted with the reconciliation return. Overpayment of the mobility tax will be refunded or may be applied to estimated mobility tax for the next tax year.

DATA SOURCES

Mobility tax estimates are derived using a variety of data sources from both public and private sources, including the following:

- AP043 Department of Taxation and Finance Metropolitan Commuter Transportation Mobility Tax - Monthly Financial Report. 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 mobility tax receipts by filing periods.
- Quarterly Census of Wage and Employment, made available by the New York State Department of Labor.
- U.S. Bureau of Economic Analysis (via Moody's Economy.com) proprietors' income, a component of State personal income (at the county level).

STATUTORY CHANGES

Chapter 25, Laws of 2009, created the metropolitan commuter transportation mobility tax, with proceeds from the tax to be distributed to the Metropolitan Transportation Authority.

FORECAST METHODOLOGY

Since mobility tax liability results from the application of a flat tax rate (0.34 percent) to payrolls of covered employees and proprietorship income allocable to the MCTD, accuracy in estimating mobility tax receipts depends most critically on the forecasting accuracy of the relevant payroll and self-employment earnings levels.

The current methodology for receipts estimates consists of two separate methods depending upon the availability of year-ago collections data for the time period:

- For months before December 2010 (which is one year after the first regular monthly payments were made), the following steps are used:
  - Generate latest forecasts of quarterly MTA area wages and annual self-employment income for the MCTD.
  - Subtract exemption estimates (e.g. Federal and Port Authority payrolls) from the wage base.
  - Apply 0.34 percent tax rate to the tax base.
  - Allocate liabilities to appropriate time periods based on due dates.
- Starting for December 2010, the following steps are used:
  - Generate latest forecasts of quarterly MTA area wages (adjusted for estimated adjustments) and annual self-employment income for the MCTD.
  - Calculate quarterly wage growth rates and annual self-employment growth rates.
  - Apply respective growth rates to year-ago tax receipts from payroll and self-employment income.

CASH RECEIPTS

Initial cash receipts were due in November 2009. In 2009-10, approximately 65 percent of receipts were received during the October through December quarter, with the remaining 35 percent received during the last quarter of the fiscal year. In 2010-11, it is estimated that the shares received will be 24.6 percent, 21 percent, 22.1 percent and 32.3 percent, respectively, in the first, second, third and fourth quarters for the fiscal year.

Risks to the Forecast

The mobility tax forecast involves managing uncertainties such as the following:

- Mobility tax receipts depend on future levels and growth rates of payrolls and self-employment income, which may diverge from forecasts made during the current period of economic uncertainty in the State and nation.

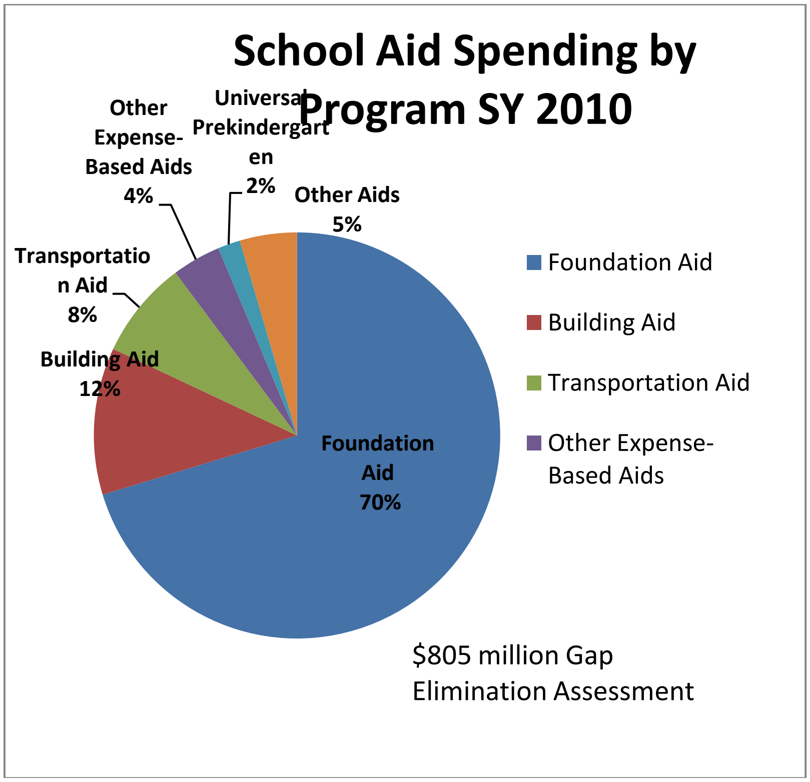
- The lack of a full year’s collections experience with this new tax contributes to the uncertainty in estimating the tax base, especially since determining the base depends on factors such as whether an employee is considered to be a “covered employee” and whether net earnings are “allocable to the MCTD.” These factors cannot be readily determined with certainty from available tax return data or other economic data.

Part III
Spending Methodologies

SCHOOL AID FORECAST METHODOLOGY

I. PROGRAM OVERVIEW

School Aid provides funding to help finance elementary and secondary education for pupils enrolled in nearly 680 public school districts throughout the State. Funding is provided based on statutory aid formulas and through reimbursement for various categorical programs.



The 2010-11 Enacted Budget provides $21.2 billion in funding for elementary and secondary education on a school year basis. The State pays approximately 70 percent of the annual school year commitment during the fiscal year it was enacted, with most of the remaining 30 percent spent in the first three months of the next fiscal year. Some programs deviate from this spending pattern. For example, the State pays 25 percent of the school year commitment for BOCES programs during the fiscal year it was enacted and 75 percent in the following year. Based on these spending patterns, School Aid spending for State fiscal year 2010-11 is $19.8 billion.

II. Key Forecasting Data and Assumptions

Education Law requires the State Education Department (SED) to release school district specific data three times a year for the purposes of calculating School Aid: February 15, May 15, and November 15. Traditionally, the November 15 database forms the basis for Executive Budget forecasts. February and May database updates are used to revise forecasts of School Aid to individual districts.

Factors from the School Aid Databases that drive School Aid include the following:

District wealth and fiscal capacity based on income per pupil and actual valuation of taxable property per pupil.

Pupil needs such as measures of student poverty, student special education needs, counts of students with limited English proficiency and geographic sparsity.

Approved Spending for instructional materials, transportation, school construction and other needs. School district expenditures for such purposes are reviewed and approved by SED.

Pupil counts such as public school enrollment, counts of students eligible for free and reduced price lunch programs, as well as pupils with limited English proficiency, among others.

In addition to these school district specific variables, the Foundation Aid formula provides for an adjustment of the standard cost of education based on changes in the consumer price index (CPI). DOB’s U.S. Macroeconomic model forecasts CPI and this forecast is incorporated in the Executive’s School Aid projections.

Below are examples of three of the largest School Aid formulas/programs, providing details of the data elements and detail regarding the formula models and assumptions. For the 2010-11 school year, the aid calculations detailed below (Foundation Aid, Transportation Aid and Building Aid) amount to $19.0 billion, or nearly 90 percent, of total State School Aid funding. For the remaining expense-based categorical programs, DOB performs multi-year growth trend analyses to develop a forecast.

Foundation Aid ($14.90 billion)

In the 2010-11 school year, Foundation Aid allocates $14.9 billion in State funds, the same level provided in the 2008-09 and 2009-10 school years.

The per pupil Foundation Aid calculation is based on the standard cost of education developed by the Regents and adjusted by CPI as well as regional cost. This is the cost of educating an "average" student in schools that are performing well as measured by statewide test results. Additional adjustments are made to take into account pupil needs.

A Pupil Needs Index, which ranges from 1.0 to 2.0, adjusts the standard cost of education amount for students in poverty (those eligible for free and reduced price lunch and as measured by census poverty data), limited English proficient pupils, and students educated in the State's rural districts.

Regional cost adjustments are based on an SED analysis of median salaries for 59 professional occupations other than teaching. Indices are established for nine labor market regions and range from 1.000 for counties in the North Country and Mohawk Valley to 1.425 for Long Island and New York City.

Under existing statute, the Foundation Aid per pupil amount will be the greater of the standard cost of education per pupil multiplied by the pupil needs index and regional cost index minus (a) an expected local tax-based contribution, or (b) multiplied by a wealth adjusted State aid ratio. The resulting per pupil amount will be multiplied by a district's TAFPU (Total Aidable Foundation Pupil Units). The TAFPU count is based on a district's average daily membership (average school year enrollment), with an additional adjustment for special education pupils.

To determine the amount of Foundation Aid a district receives each year, a phase-in factor is applied to the calculated fully phased-in amount, based on data updates submitted by school districts. For example, in the 2010-11 school year, a district will receive the sum of its 2006-07 base year aids, plus 37.5 percent of its projected fully implemented Foundation Aid increase. Pursuant to statute enacted with the 2010-11 State Budget, the table below provides a summary of the planned phase-in scheduling of Foundation Aid.

Current Foundation Aid Phase-In

	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14
Phase-in %	0.0%	20.0%	37.5%	37.5%	37.5%	53.1%	75.0%	100.0%
Total Aid	$12.5	$13.6	$14.9	$14.9	$14.9	$16.1	$17.7	$19.7
Annual Increase	$0	$1.1	$1.3	$0	$0	$1.2	$1.6	$2.0
Cumulative Increase	$0	$1.1	$2.4	$2.4	$2.4	$3.6	$5.2	$7.2

Building Aid ($2.50 billion)

Building Aid provides reimbursement for capital projects authorized by local voters. A district's aid is determined using an SED-approved cost allowance multiplied by the district's aid ratio, which is based on a district's property wealth per pupil. Building Aid to school districts is determined using assumed amortization for individual projects. The State provides reimbursement for a building project over a period ranging from fifteen to thirty years, depending on the type of project, and a statewide average interest rate that is reflective of actual bonding at the time that the project is initiated. For the Big Five City school districts (New York City, Buffalo, Rochester, Syracuse, and Yonkers) and any district using the Dormitory Authority of the State of New York (DASNY) as the borrowing vehicle the actual interest rate is used to determine State reimbursement.

Current statute provides for several Building Aid tiers -- a variety of reimbursement rates depending on the time period when a building project was initiated and the type of school district. The State's 207 "high need" school districts (which are determined by SED and include the Big Five City school districts) are provided with an additional aid enhancement, so that a maximum of 98 percent of their approved costs may be reimbursed as Building Aid. In order to project annual and future Building Aid, a number of different factors are taken into account. Current project costs and aid in each of the several tiers are calculated. Pertinent factors include the trends in "aidable costs" (how much of district costs are falling within the cost allowances), projections for the additional school construction projects in the State using trends in past growth, the current Statewide average interest rate, and any changes in statute that may have a impact on overall Building Aid (such as the incentives for high needs districts noted above and EXCEL discussed below).

In 2006, Building Aid was supplemented by EXCEL (Expanding our Children's Education and Learning), a $2.6 billion construction program (with $1.8 billion allocated for New York City). EXCEL-related monies can be used to fund the local share of building projects (including costs that would otherwise exceed maximum cost allowances established by SED). This has resulted in additional building projects, which are reimbursable through regular Building Aid. This expected continued increase in building projects due to the availability of EXCEL funding for the local share is built into the current forecast.

Transportation Aid ($1.65 billion)

School districts receive Transportation Aid based on approved operating and capital expenses for the transportation of more than two million students statewide. The State reimburses districts for transportation-related expenses already incurred, and reimbursement is adjusted to reflect school district property wealth, enrollment and geographic sparsity factors. Depending on these factors, districts may receive between 6.5 percent to 90 percent reimbursement for their transportation-related expenses. In the 2010-11 school year school districts statewide will receive $1.7 billion in Transportation Aid, an increase of $99 million over the 2009-10 school year or 6.4 percent. Over the last 5 years, Transportation Aid has grown on average by 7 percent annually.

Several factors may affect how much districts spend for transportation purposes in any given year including inflation, fuel costs, staff salaries, and the unexpected breakdown or scheduled replacement of vehicles. In general, transportation-related expenses are reimbursed on a one-year lag. Expenses generated in the 2009-10 school year are eligible for reimbursement in the 2010-11 school year. Since contracts and capital purchases must be approved by the Commissioner of Education in order to be considered for State aid reimbursement, this provides districts with the necessary time to report data to SED and for SED staff to review submitted expenses and to calculate eligible aid. Reimbursement is based on claims filed by school districts and approved by SED.

Aid on all types of transportation capital expenses, including garage rentals, leases and vehicle and equipment purchases is paid based on assumed amortization schedules using a statewide average interest rate. DOB forecasts Transportation Aid growth by looking at multi-year trends in claims and projecting forward these growth patterns. In addition, adjustments may be made to current-year forecasts based on anticipated changes in fuel costs or approved capital expenses.

III. Current Four-Year School Aid Spending Projections

Within School Aid, the major programs expected to have the largest increase are Foundation Aid/Academic Achievement Grant ($5.5 billion), expense-based aids such as Building, Transportation, and Special Education Aids ($1.9 billion), and Universal Prekindergarten ($271 million).

Four Year School Aid Projection -- School Year Basis
(millions of dollars)

	2010-11*	2011-12	Annual $ Change	2012-13	Annual $ Change	2013-14	Annual $ Change	2014-15	Annual $ Change
Foundation Aid/Academic Achievement Grant	$14,894	$16,063	$1,169	$17,649	$1,586	$19,679	$2,030	$20,443	$764
Universal Prekindergarten	$378	$462	$84	$564	$102	$630	$66	$649	$19
Expense-Based Aids (Building, Transportation, High Cost and Private Special Education, BOCES)	$5,914	$6,340	$426	$6,800	$460	$7,300	$500	$7,840	$540
Other Aid Categories/Initiatives	$807	$845	$38	$907	$62	$971	$64	$1,038	$67
Gap Elimination Adjustment	($1,412)	$0	$1,412	$0	$0	$0	$0	$0	$0
Federal Education Jobs Fund	$607	$0	($607)	$0	$0	$0	$0	$0	$0
Total School Aid	**$21,188**	**$23,710**	**$2,522**	**$25,920**	**$2,210**	**$28,580**	**$2,660**	**$29,970**	**$1,390**

* To close a current-year budget shortfall, State aid amounts for the 2010-11 school year (excluding Federal funds) are to be reduced by approximately one percent as provided for by Part A of Chapter 313 of the Laws of 2010. The amounts will be witheld from payments due to school districts in the 2010-11 state fiscal year.

Risks and Variations to Forecasting Model

The key variable that impacts the School Aid forecasts are periodic database updates. As discussed, existing statute requires individual school districts to provide data for School Aid calculation purposes to SED. The data from the November 15th database is used for the annual Executive Budget School Aid proposal for the succeeding school year. School districts have additional opportunities to update their data in February and May. Typically, it is the revised data that is used for School Aid calculations for the Enacted Budget and for future adjustments to monies due to individual districts.

In recent years, statute has provided that, for a particular school year, individual districts may not receive an apportionment greater than that provided for in the Enacted Budget. Any excess aid due to new or revised claims for State aid will be paid in September of the following school year, thereby limiting the fiscal year liability in any given year. A statute of limitations provision provides prior year adjustments, subject to funding appropriated for this purpose, for district claims that are not submitted in a timely manner.

MEDICAID FORECAST

I. PROGRAM OVERVIEW

Medicaid, which is jointly financed by the Federal government, the State, and local governments (e.g., counties and New York City) provides health care services, including long term care, for low income, mentally-ill, disabled and elderly individuals. Prior to 2006, for most services the non-Federal share of Medicaid costs was shared equally between the State and local governments. Since that time, local contributions have been capped at the 2005 level, with a statutorily specified annual increase. The Department of Health (DOH) is the single State agency responsible for administering the Medicaid program. A number of other State agencies, including the Office of Mental Health (OMH), the Office for People with Developmental Disabilities (OPWDD), the Office of Alcoholism and Substance Abuse Services (OASAS), the Office of Children and Family Services (OCFS) and the State Education Department (SED) use Medicaid to finance health care services provided to their clients.

New York provides nearly all services allowed by the Federal Government and other services as authorized through Federal waivers. Services are provided to an average of just over 4 million clients each month (approximately 4.7 million individuals are enrolled in Medicaid and Family Health Plus) by a network of over 60,000 eligible health care providers or through managed care contracts with specific health plans. Roughly two-thirds of the State's Medicaid recipients are enrolled in managed care plans, while the balance access services on a fee-for-service basis**.** Currently, 37 counties plus NYC participate in mandatory enrollment of Medicaid recipients in managed care plans, except for populations that cannot be enrolled in managed care (e.g., children in foster care) and those that can only be enrolled on a voluntary basis (e.g., individuals with HIV/AIDS).

The Medicaid program uses various methods to determine provider reimbursement levels. On a fee-for-service basis, these methods are tailored to the service provided and include service-based fees and provider specific rates. Managed care plans receive capitated (e.g., fixed) payments per enrolled patient on a monthly basis. Various control mechanisms (e.g., utilization thresholds, prior authorization) are also employed to ensure that services are medically necessary and consistent with Federal guidelines.

Providers submit claims for fee-for-service reimbursement that are processed through a computerized claims payment system or Medicaid Management Information System (MMIS) – called eMedNY, which is operated by a private contractor under the oversight of the Department of Health. Medicaid Managed Care premiums are also paid though MMIS. Each year more than 300 million claims are processed through MMIS. This system generates a payment only after verifying that the claim does not deviate from established control mechanisms, including recipient eligibility, provider standing and service authorization. Providers are paid on a weekly basis, and generally on a two week lag after the claim is approved.

II. KEY FORECASTING DATA AND ASSUMPTIONS

FACTORS IMPACTING THE MEDICAID FORECAST

Medicaid spending in any State fiscal year is determined by the price of the services provided through the program (e.g., nursing homes, hospitals, prescription drugs) and the utilization of those services (reflects both the number of individuals enrolled in Medicaid and the amount of services they use). Medicaid price and utilization, in turn, are influenced by a multitude of factors including economic conditions, litigation, changes in the health care market place, prescription drug pricing and product development by manufacturers, complex reimbursement formulas which themselves are affected by another set of factors (e.g., length of hospital stays), total enrollment in Medicaid and the behavior of recipients accessing services. The State share of Medicaid spending is also dependent on the local government contribution towards Medicaid costs – which is now determined pursuant to the 2005 Medicaid Cap legislation – and Federal funding, which can be affected by both statutory and administrative changes at the Federal level.

FORECASTING METHODOLOGY/DATA

State Medicaid disbursements are forecast on a cash basis and updated on a quarterly basis, consistent with the schedule for revising the State Financial Plan. Disbursements are evaluated both on a weekly basis using data on aggregate weekly cycle payments and based upon a detailed review of monthly service category claims data, generated by MMIS. The forecast is used to evaluate current year spending and project spending for the next budget year. Spending estimates in the out-years are developed based upon these estimates and compared for consistency with the Medicaid growth factors estimated by the Federal Congressional Budget Office.

The Medicaid forecast involves an evaluation of all major service categories using a standard approach. The forecast uses category-specific MMIS data provided by the Department of Health (DOH) on a monthly basis. This includes detail on total paid claims and premiums, retroactive spending adjustments, caseload and service utilization. This data is incorporated into mathematical models that are used to predict future expenditure patterns based upon historical expenditure patterns and seasonal trends. The models also consider non-MMIS data (e.g., managed care enrollment, Federal Medicare premiums, trends in the pharmaceutical industry) in certain areas to generate program specific expenditure projections. The forecast only applies to Medicaid spending in DOH's budget and does not reflect additional spending in OPWDD, OMH, OASAS, OCFS or SED.

In general, the monthly actual data for the current year is annualized with consideration of price (e.g., the cost of services) and utilization (which reflects caseload, or the number of recipients, and the level of services used by those recipients) trends and seasonal patterns. These estimates are then adjusted to incorporate planned changes that are not yet reflected in the actual claims data (e.g., pending reimbursement changes, State or Federal policy changes). This process develops a revised estimate of annual spending. The revised estimate is then compared to the previous disbursement estimates and variances are identified. Variances are evaluated and quantified as impacting the price or utilization of the services. Significant variances form the basis for updating overall Medicaid disbursement estimates in the next State Financial Plan Update.

In addition to a detailed claims based analysis, aggregate weekly cash disbursements are regularly evaluated against expected values to monitor variances and predict future spending levels. This provides another check of spending patterns, as different models may be more or less sensitive to seasonal variations or longer-term trends.

III. FORECAST PROJECTION MODELS

The following describes the specific forecasting methodologies used for estimating Medicaid State funds spending for services provided on a fee-for-service basis (costs are incurred based on the specific services provided); for services provided through managed care or Family Health Plus health plans (costs are based on monthly plan premiums) and for the costs of the statutory cap on local government contributions towards their Medicaid costs. The same basic methodology is used to project fee-for-service across all service categories (e.g., hospitals, nursing homes, physicians) while managed care spending is projected using a different enrollment and premium based methodology. A sample forecast is provided for the hospital inpatient category and the specific methodology used for managed care/Family Health Plus is also described. A number of cash adjustments (e.g., nursing home assessments, HCRA revenues, fraud recoveries) are netted against the State funds spending estimate to calculate the Medicaid General Fund appropriations.

FEE-FOR-SERVICE – (SAMPLE FORECAST FOR HOSPITAL INPATIENT)

Fee-for-service hospital inpatient Medicaid spending is based upon a complex reimbursement rate which is predicated primarily on the number of patient discharges and the costs associated with those discharges. There are also a number of other factors which are used in determining the specific reimbursement rates for over 200 hospitals in New York State (e.g., length of hospital stay, hospital patient volume, case mix, volume, capital costs). The Department of Health (DOH) updates the hospital rates annually.

DOB projects inpatient spending – for both current and future years – by using actual claims (e.g., spending) data, generated by MMIS, and adjusting that data to produce an annual DOH hospital inpatient spending estimate for the current year.

Specifically, the claims data is adjusted for:

- Spending in State-operated Mental Health and substance abuse facilities (which is budgeted in other State agencies);
- Seasonal spending modifications based upon prior year patterns for price and utilization (e.g., more hospital spending may occur in winter months);
- Policy changes not yet implemented (from Enacted Budget or Federal actions);
- Utilization changes based on a comparison of prior year to current year actual spending;

- The timing of rate actions/Federal State Plan Amendment approvals; and
- "Off-line" payments not reflected in the claims data (generally one-time lump sum payments and other cash adjustments, e.g., hospital disproportionate share payments).

This current year estimate becomes the new base for projecting spending in the Budget Year and out-years. Further adjustments to the Budget Year projection include year-to-year price and utilization growth; incremental changes to policy initiatives; consideration of actions that will occur in that year; and an annual projection of savings from the continuation of shifting individuals from FFS to managed care. Annual growth projections in price and utilization are determined by historical experience of year-to-year changes in discharges and price per discharge. DOB regularly reviews current claims data compared to historical data to detect trends. These trends, as well as Congressional Budget Office forecasts, are identified and incorporated into the recast.

FEE-FOR-SERVICE PROJECTION MODEL (HOSPITAL INPATIENT SERVICES)

Current Year Projection

$CY = S_{ytd} + R_{ytd} + ((S_{ytd}/AC)*(1+SEs)*C_{yr})) + M_{1,2,\ etc}$

Budget Year Projection

$BY = (CY - S_{nr}) + (CY- S_{nr} * P) + (CY- S_{nr} * U) + M_{1,\ 2,\ etc}$

Current Year

CY = Current Year Projection
S_{ytd} = Year to Date Spending
R_{ytd} = Retroactive Spending (e.g., payments made for prior periods) Year to Date
AC = Actual # of Cycles to date
SEs = Seasonal Factor based on prior year MARS 72 spending patterns

C_{yr} = # of Cycles Remaining in Year
M = Manual Adjustments (e.g., lump sum and offline payments, managed care shift, Federal actions, timing adjustments, anticipated retroactive payments, etc.)

Budget Year

BY = Budget Year Projection
CY = Current Year Projection
S_{nr}= Non-recurring Spending
P = Price Rate (based on historical trends)
U = Utilization Rate (based on historical trends)
M = Manual Adjustments (e.g., lump sum and offline payments, managed care shift, Federal actions, timing adjustments, anticipated retroactive payments, etc.)

MANAGED CARE/FAMILY HEALTH PLUS

Medicaid managed care and Family Health Plus (FHP) expenditures result from set monthly premiums paid for clients enrolled in prepaid health insurance plans, generally referred to as Health Maintenance Organizations (HMOs). Currently, 18 plans participate in Medicaid managed care and 19 in Family Health Plus (a number of plans participate in both programs). State fiscal year 2010-11 represents the third year of a four-year phase in of a risk adjusted rate methodology. The premiums are a blended rate of each plan's current premium trended forward and a risk-adjusted rate. Managed care/Family Health Plus spending is a function of enrollment, the number and type of plans that participate and changes in premium rates.

Forecasting expenditures for the current year involves utilizing monthly MMIS data for the plans, including claims (expenditure) data, service units and beneficiary data. For price, the current year estimate uses annual premium costs submitted by DOH and approved by DOB. For utilization, monthly actuals create the basis for a per-member-per-month (PMPM) average premium price. An average premium price, based upon actual data, is used because premium rates vary widely by region, by plan, and by Medicaid eligibility group. For example, premium rates for Temporary Assistance for Needy Families (TANF) individuals – low income recipients who qualify for public assistance benefits – are generally lower than those for elderly, blind or disabled individuals who qualify for Supplemental Security Income (SSI).

Managed care and FHP enrollment projections, estimated by DOH, are used in the estimation process for both current and out-year projections. Projections are based on current enrollment of plans, as well as anticipated new enrollment. Out-year adjustments are then made to reflect any pending administrative or statutory actions.

Managed Care/Family Health Plus Projection Model

Current Year Projection

$$CY = S_{ytd} + R_{ytd} + \Sigma(R_{MCMM} * A_{PMPM}) + M_{1,2,\text{ etc.}}$$

Out-Year Projection

$$OY = CY - S_{nr} + P + U + M_{1,2,\text{ etc.}}$$

Current Year

CY = Current Year Projection
S_{ytd} = Year to Date Spending
R_{ytd} = Retroactive Spending (e.g., payments made for prior periods) Year to Date
R_{MCMM} = Remaining Monthly Combined Member Months
A_{PMPM} = Average Per-Member-Per-Month Premium Rate
M = Manual Adjustments (e.g., timing, overlap payments from Fee-for-Service to Managed Care, cost containment implementation, anticipated recurring payments)

Budget Year

OY = Out Year Projection
S_{nr}= Non-recurring Spending
P = Price Rate (Sum of the projected annual combined member months times the Budget Year average premium cost)
U = Utilization Rate (e.g., Estimated Number of New Member Months Multiplied by Cost of Premiums)
M = Manual Adjustments (e.g., timing, overlap payments from Fee-for-Service to Managed Care, cost containment implementation, anticipated recurring payments)

STATE SPENDING FOR LOCAL MEDICAID CAP

Since implementation of the Local Medicaid Cap in January 2006, the State has assumed all local government costs above statutorily established local cap payments. Local cap payments are determined on a county-specific basis using actual calendar year 2005 costs increased by 3.5 percent in 2006, another 3.25 percent in 2007, and an additional 3.0 percent annually starting in 2008. This calculation generates the county's local cap payments within a given State fiscal year.

The State is responsible for all local costs above the maximum local payment level. These State costs are initially determined based upon historical trends in local expenditures and then subsequently adjusted to reflect the impact of enacted budget initiatives, changes in Medicaid claiming (in line with our projection of State share costs) and the results of a statutory reconciliation of local cap payments, that is typically released by DOH each September.

Effective January 1, 2008, a one-time adjustment is made associated with Monroe County's decision to have a percentage of its local sales tax intercepted by the State (equivalent to its current local cap payment) to support the county's share of Medicaid expenses rather than continue with the local cap payment. Monroe County was the only county to elect this option. Under current statute, Monroe County will no longer pay local share payments to DOH. The sales tax revenue intercepted will be now be counted as a revenue receipt to the State.

Medicaid Spending Projections

Price and utilization projections are based on DOB's analysis of MMIS data reflected in Medical Assistance Reporting System (MARS) reports provided by DOH on a monthly basis, as detailed below. Specifically, the MARS 72 that provides total Medicaid expenditures, the MARS 73 that details retroactive Medicaid payments and MARS 50 that supplies information on total Medicaid beneficiaries and service units.

Category of Service	Price	Utilization
Inpatient	Total Expenditures (MARS 72) divided by Total Beneficiaries (MARS 50); Retroactive Payments (MARS 73) considered separately because they do not occur uniformly in a year	Total Beneficiaries (MARS 50)
Clinics	Total Expenditures (MARS 72) divided by Total Visits (MARS 50 Service Units); Retroactive Payments (MARS 73) considered separately because they do not occur uniformly in a year	Total Visits (MARS 50)
Nursing Home	Total Expenditures (MARS 72) divided by Total Bed Days (MARS 50 Service Units); Retroactive Payments (MARS 73) considered separately because they do not occur uniformly in a year	Total Bed Days (MARS 50)
Home Care	Total Expenditures (MARS 72) divided by Total Hours (MARS 50 Service Units); Retroactive Payments (MARS 73) considered separately because they do not occur uniformly in a year	Total Hours (MARS 50)
Managed Care/ Family Health Plus	Total Premium Payments based on DOH Rate Appeal	Projected SFY annual combined member months minus prior SFY annual combined member months times anticipated average monthly premium cost times anticipated State share percentage
Pharmacy/Part D (budget includes State share rebates and Medicare Part D clawback payments)	Total Expenditures (MARS 72) divided by Total Prescriptions (MARS 50 Service Units)	Total Prescriptions (MARS 50)
Other Non-Institutional (e.g., physician, dental, eyeglasses, medical equipment, x-rays, laboratory services)	Total Expenditures (MARS 72) divided by Total Service Units (MARS 50 Service Units); If necessary, retroactive payments (MARS 73) considered separately because they do not occur uniformly in a year	Total Service Units – Beneficiaries, Visits, Items (MARS 50)

RISKS AND VARIATIONS TO FORECASTING MODELS

Forecasting Risk

The Medicaid disbursement forecast provides a point-in-time estimate for program spending based on an analysis of current and historical claims and a number of other known factors (e.g., caseload trends, Federal Congressional Budget Office Medicaid growth estimates and other factors for the out-years). These estimates can be subject to considerable variance and are highly sensitive to economic conditions (although the impact of economic changes are usually lagged and do not immediately affect Medicaid spending); changes in State and Federal guidelines, policies, and statutes; litigation by providers or advocacy groups and developments in the health care marketplace.

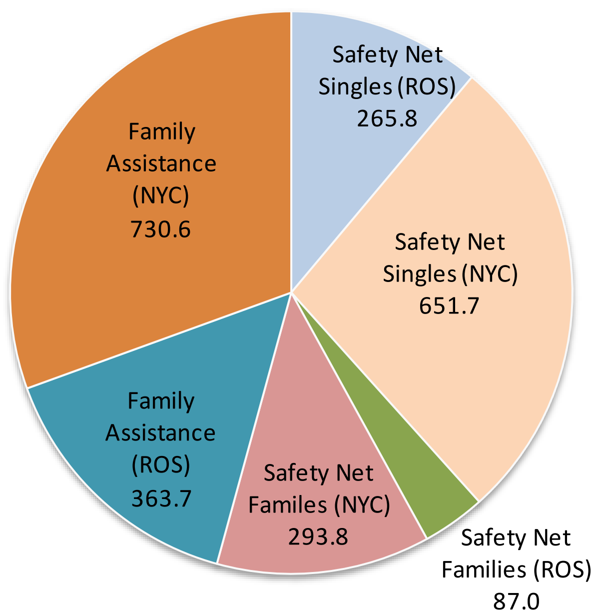
For example, the advent of a Federal Medicare drug benefit (Part D) in 2006 drastically impacted Medicaid pharmacy projections and created a dramatic nonrecurring decline in pharmacy claims data. At the same time Medicaid continues to fund these dually eligible (Medicare and Medicaid) recipients through a statutorily prescribed monthly Medicare contribution (the clawback payment). Evaluating changes in drug mix, transition coverage and the Federal Medicare calculations were critical factors in adjusting the State's Medicaid projection for prescription drugs.

WELFARE PROGRAM FORECAST METHODOLOGY

I. PROGRAM OVERVIEW

The Office of Temporary and Disability Assistance (OTDA) local assistance programs provide cash benefits and supportive services to low-income families, children and adults living in New York State. OTDA's main cash assistance programs are Temporary Assistance for Needy Families (TANF) and Safety Net Assistance. The TANF program, which is financed jointly by the State, the Federal government and counties (including New York City), provides employment assessments, support services and time-limited cash assistance to eligible families and children. The Safety Net Assistance program, financed jointly by the State and counties, provides cash assistance to single adults, childless couples, and families who have exhausted their five-year Federal time-limit on TANF. The projected SFY 2010-11 public assistance expenditures are summarized below:

Gross SFY 2010-11 Public Assistance Expenditures
Projected Total $2.4 Billion
(millions of dollars)



II. KEY FORECASTING DATA AND ASSUMPTIONS

The most significant driver of New York State's welfare spending is its public assistance caseload. Although the caseload is volatile and thus difficult to predict, there is a strong relationship between the number of welfare recipients and economic factors such as the unemployment rate and the number of individuals employed in low-wage work. The costs associated with this caseload are dependent on factors such as the recipients' housing arrangements (homeless shelters and substance abuse residential programs are more expensive than regular housing) and shifting demographics (larger family sizes equal larger benefit payments).

The welfare model provides forecasts for TANF families and Safety Net recipients separately for New York City (NYC) and for the rest of the State (ROS). ROS includes rural upstate and western New York as well as the wealthier, more densely populated suburban counties of the Hudson Valley and Long Island. The forecast for TANF families includes those families that have exhausted their five-year Federal time-limit (Safety Net families).

Current Population Survey data indicate that welfare recipients who work tend to be concentrated in industries that have large numbers of relatively low-wage entry level jobs. For convenience, we refer to employment aggregated across these industries as "entry-level employment." Additional factors believed to be relevant to labor market entry include unemployment rates.

DOB uses econometric models to forecast entry-level employment and unemployment rates separately for NYC and for ROS. Many of the input variables used in these models, such as statewide unemployment rates, statewide employment in entry-level industries, and real wages in the finance and insurance sector, are derived from DOB's macroeconomic model for the New York State economy. In a second set of econometric models, welfare caseloads are estimated conditional on the forecasts for entry-level employment levels, unemployment rates, and other relevant variables. Thus, the caseload forecasts are fully consistent with DOB's overall economic outlook.

Forecasting Regional Employment and Unemployment Rates

Entry-level employment is defined here as employment aggregated over the following sectors: manufacturing; retail trade; administrative and support and waste management and remediation services; arts, entertainment, and recreation; accommodation and food services; and other services. Regional entry-level employment is assumed to be driven by the same factors that drive statewide employment growth in those same industries. Statewide entry-level employment growth is used as a proxy for those factors.

Estimation results using quarterly data suggest that a one-percent year-over-year increase in statewide entry-level employment increases NYC entry-level employment by about 1.2 percent and ROS entry-level employment by 1.0 percent. Year-over-year growth in ROS entry-level employment is also lifted by wage growth in the finance and insurance sector. Finance and insurance sector wages have a large spillover effect onto the rest of the State economy as commuters spend their incomes in their counties of residence.

Estimation results also indicate that a one-percentage point year-over-year increase in the statewide unemployment rate is predicted to increase the NYC unemployment rate by about 1.3 percentage points, while a one-percentage point rise in the State's unemployment rate is estimated to increase the ROS unemployment rate by about 0.8 percentage points.

Forecasting Welfare Caseloads

Table 1 shows the specifications for the welfare caseload equations.[1] Caseloads are estimated to vary with entry-level employment levels and unemployment rates, as well as with various measures related to compensation deemed particularly relevant for entry-level workers such as the statewide average nonfarm wage. The models also contain measures that attempt to capture the impact of administrative and programmatic efforts at the national, State, and local levels to reduce welfare dependency, including changes in eligibility criteria such as the added work requirements and term limits introduced with the passage of the Federal Personal Responsibility and Work Opportunity Reconciliation Act of 1996 (PRWORA) - which replaced the old welfare program.

Growth in the New York City TANF population is a function of the prior quarter's TANF population and the impact of local and State administrative efforts lasting from the first quarter of 1995 through the third quarter of 2001.[2] A higher NYC unemployment rate is estimated to increase the New York City TANF caseloads a quarter later. The TANF caseload growth for the rest of the state depends on its growth in the previous quarter, and administrative efforts, as well as current and past values of ROS entry-level employment growth.

Growth in New York City's Safety Net caseload depends on its own past value and declines significantly with administrative efforts. Higher year-over-year NYC entry-level employment growth is estimated to reduce Safety Net cases in NYC. A change to Federal regulations affected the number of NYC Safety Net cases between the third quarter of 1987 and the fourth quarter of 1989 – this affect is captured by dummy variables.

Higher growth in ROS entry-level employment in the current quarter as well as in the previous quarter is associated with lower ROS Safety Net caseloads, while a higher ROS unemployment rate increases the caseload. State administrative efforts also lowered Safety Net caseloads significantly. A seasonal dummy variables accounts for the uptick in Safety Net caseloads during the fourth quarter of the calendar year.

[1] In this report, the "caseload" is defined as the number of recipients.
[2] The estimated endpoint for these efforts is presumed to coincide with the terrorist attacks of September 11.

TABLE 1
TANF AND SAFETY NET CASELOAD MODELS

$$\Delta \ln TANF_{NYC,t} = \underset{(0.060)}{0.733}\ \Delta \ln TANF_{NYC,t-1} + \underset{(0.002)}{0.004}\ \Delta UR_{t-1} - \underset{(0.003)}{0.009}\ ADMIN_t + \underset{(0.008)}{0.062}\ D2007{:}3_t + e_t \qquad \text{Adjusted } R^2 = 0.70$$

$$\Delta \ln TANF_{ROS,t} = \underset{(0.055)}{0.754}\ \Delta \ln TANF_{ROS,t-1} - \underset{(0.036)}{0.151}\ \Delta \ln WE_{ROS,t} - \underset{(0.035)}{0.093}\ \Delta \ln WE_{ROS,t-3} - \underset{(0.002)}{0.008}\ ADMIN2_t - \underset{(0.093)}{0.288}\ AR2_t + e_t \qquad \text{Adjusted } R^2 = 0.76$$

$$\Delta \ln SN_{NYC,t} = \underset{(0.074)}{0.431}\ \Delta \ln SN_{NYC,t-1} - \underset{(0.089)}{0.267}\ \Delta_4 \ln WE_{NYC,t} - \underset{(0.006)}{0.024}\ ADMIN_t - \underset{(0.024)}{0.088}\ D1987{:}3_t + \underset{(0.025)}{0.075}\ D1989{:}4_t - \underset{(0.019)}{0.143}\ D2007{:}3_t + e_t \qquad \text{Adjusted } R^2 = 0.68$$

$$\Delta \ln SN_{ROS,t} = -\underset{(0.003)}{0.010} + \underset{(0.078)}{0.484}\ \Delta \ln SN_{ROS,t-1} - \underset{(0.100)}{0.326}\ \Delta \ln WE_{ROS,t} - \underset{(0.080)}{0.443}\ \Delta \ln WE_{ROS,t-1} + \underset{(0.004)}{0.011}\ \Delta UR_{ROS,t} - \underset{(0.005)}{0.018}\ ADMIN2_t + \underset{(0.022)}{0.067}\ D2002{:}1_t + \underset{(0.008)}{0.037}\ Q4_t - \underset{(0.100)}{0.281}\ AR2_t + e_t \qquad \text{Adjusted } R^2 = 0.68$$

$TANF_{NYC}$	TANF caseload in New York City
$TANF_{ROS}$	TANF caseload in Rest of State
SN_{NYC}	Safety net caseload in New York City
SN_{ROS}	Safety net caseload in Rest of State
WE_{NYC}	New York City entry-level employment
WE_{ROS}	Rest-of-State entry-level employment
WG	Total State wages
UR_{NYC}	New York City unemployment rate
ADMIN	New York City administrative effort dummy, 1 between 1995Q1 and 2001Q3, 0 otherwise
ADMIN2	Rest of State administrative effort dummy, 1 between 1994Q3 and 2001Q3, 0 otherwise
Q*i*	Indicator variable for quarter *i*, *i*=1,2,3,4
Dyr:q	Dummy for quarter q in year yr
AR2	Autocorrelation correction term

Forecasting Monthly Average Payments

The individual caseload number for each category of public assistance is multiplied by the monthly average payment (MAP) for each category to determine overall welfare related expenditures. The MAP is generated by dividing the total expenditure for the given category (from the latest available annual data) by the actual caseload for that year.

III. SPENDING PROJECTIONS (MID-YEAR UPDATE)

The table below details 2009-10 actual through 2014-15 projections.

WELFARE SPENDING PROJECTIONS

	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
TANF FAMILIES - NYC						
Recipients/month	153,655	146,053	140,701	138,323	137,134	136,138
Monthly Average Payment	$416.85	$416.85	$416.85	$416.85	$416.85	$416.85
Gross Expenditures	$768,613,041	$730,586,317	$703,814,542	$691,919,311	$685,971,695	$680,989,504
TANF FAMILIES - ROS						
Recipients/month	102,333	109,510	111,652	111,145	109,974	108,771
Monthly Average Payment	$276.73	$276.73	$276.73	$276.73	$276.73	$276.73
Gross Expenditures	$339,823,333	$363,656,428	$370,769,496	$369,085,870	$365,197,260	$361,202,386
SAFETY NET FAMILIES - NYC						
Recipients/month	88,905	85,446	82,349	80,973	80,285	79,709
Monthly Average Payment	$286.53	$286.53	$286.53	$286.53	$286.53	$286.53
Gross Expenditures	$305,687,396	$293,794,109	$283,145,508	$278,414,324	$276,048,733	$274,068,237
SAFETY NET FAMILIES - ROS						
Recipients/month	30,326	33,329	33,964	33,814	33,467	33,110
Monthly Average Payment	$217.54	$217.54	$217.54	$217.54	$217.54	$217.54
Gross Expenditures	$79,165,416	$87,004,688	$88,662,343	$88,270,771	$87,364,934	$86,432,993
SAFETY NET SINGLES - NYC						
Recipients/month	105,128	104,466	103,378	102,410	101,685	101,242
Monthly Average Payment	$519.88	$519.88	$519.88	$519.88	$519.88	$519.88
Gross Expenditures	$655,847,336	$651,717,409	$644,929,856	$638,890,930	$634,367,974	$631,604,292
SAFETY NET SINGLES - ROS						
Recipients/month	56,686	60,366	59,679	58,282	57,181	56,196
Monthly Average Payment	$366.91	$366.91	$366.91	$366.91	$366.91	$366.91
Gross Expenditures	$249,583,923	$265,786,669	$262,761,863	$256,610,983	$251,763,369	$247,426,492
TOTAL GROSS COSTS	$2,398,720,445	$2,392,545,618	$2,354,083,606	$2,323,192,189	$2,300,713,964	$2,281,723,903
TOTAL RECIPIENTS	537,033	539,170	531,723	524,947	519,726	515,166

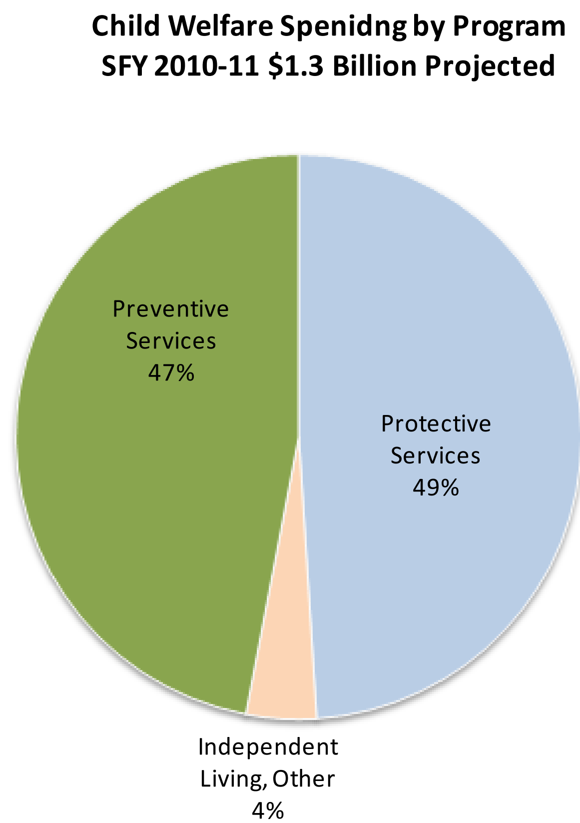
IV. RISKS AND VARIATIONS TO FORECASTING MODEL

A major risk factor in the welfare caseload forecast entails using monthly average payments that are one year old in the projection of future costs – the alternative would be to trend MAP for each category of public assistance. However, due to the variances in the growth patterns of these different groups, trending would most likely result in inflated projections. In addition to the MAP issue, there are numerous other factors that can impact costs, from a sudden downturn in the economy to policy and/or administrative changes that make it easier to become eligible for or remain on public assistance.

CHILD WELFARE SERVICES FORECAST METHODOLOGY

I. PROGRAM OVERVIEW

The Office of Children and Family Services (OCFS) child welfare local assistance funding supports services delivered by local social services districts to at-risk youth and families. Services funded include district investigation of alleged child abuse (child protective services or CPS), initiatives intended to keep vulnerable children in the home rather than in foster care (preventive), independent living services for older children aging out of foster care, aftercare, and adoption administration. Child welfare services are financed jointly by the State, the Federal government, and local social services districts. Services are provided as an "entitlement" and are financed with an open-ended General Fund commitment of 62 percent State reimbursement of local social services districts' expenses net of available Federal funds. Gross spending is projected to total $1.3 billion in SFY 2010-11. Spending by program is summarized in the following chart:



Child welfare spending is determined by the demand for services (e.g. the number of reports of child abuse and the number of families requiring intervention) and the cost of services provided by local social services districts, including the number of district workers and their salaries. Many districts contract out for preventive services and these costs are driven by similar factors. Local district costs vary depending upon CPS and preventive caseloads, the level of community awareness, and local discretion in child welfare services programming.

II. KEY FORECASTING DATA AND ASSUMPTIONS

Local district claims serve as a proxy for child welfare caseload. Caseload shifts can be caused by any number and combination of factors, including increased public awareness of child abuse and neglect and decisions made at the local level regarding the range and duration of services. Since the program's inception in SFY 2002-03, historical claiming has been the basis for trending program growth in the budget year and outyears, as annual increases in claims can range from double-digit growth to nearly no growth. Continuing this approach in SFY 2011-12, DOB's forecast includes five years of historical claiming to determine a trend factor for the budget year and outyears.

The trend factor is applied to three quarters of actual claims and the projected final quarter in the current year to project budget year and outyear gross claims, as the final quarter of claims is not available at the time of the October update. (For example, SFY 2010-11 claims run from October 2009 to September 2010, so the final quarter of claims is not available given a three-month lag in claims.) The final quarter is projected using the historical share of 4th quarter claims in prior years.

Finally, Federal funding is applied to gross claims to generate the State's 62 percent share net of Federal.

III. OVERALL CHILD WELFARE SERVICES SPENDING PROJECTIONS

DOB currently forecasts child welfare services spending from 2010-11 through 2014-15. The following chart depicts projected State cash for child welfare services.

CHILD WELFARE SERVICES SPENDING PROJECTIONS
(millions of dollars)

	2010-11	2011-12	2012-13	2013-14	2014-15
State General Fund	468.6	551.6	687.2	880.3	1000.3

IV. RISKS IN CHILD WELFARE SERVICES FORECAST

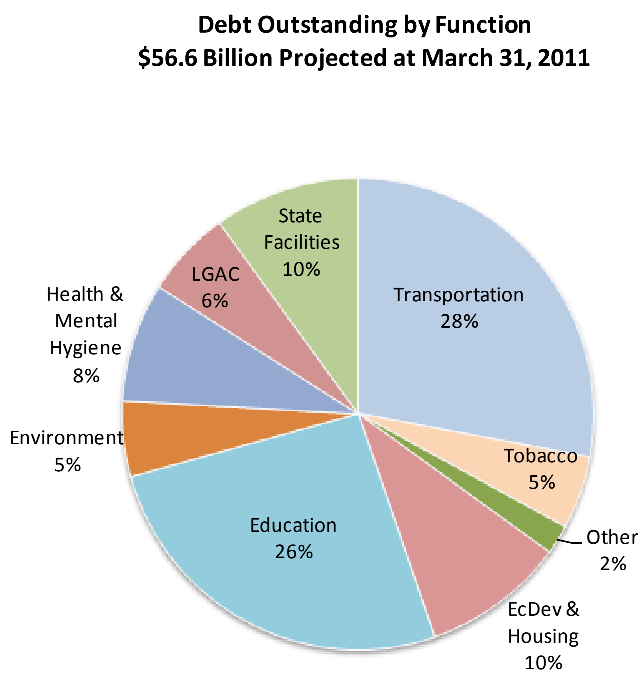
Local district claiming is generally difficult to predict. Claiming patterns are affected by: the lack of predictability in service utilization as districts vary in their responses to child welfare service needs; varying individual service needs and costs; and variances in the financial capacity of districts to invest in child welfare services as districts must first invest in programs and then receive reimbursement.

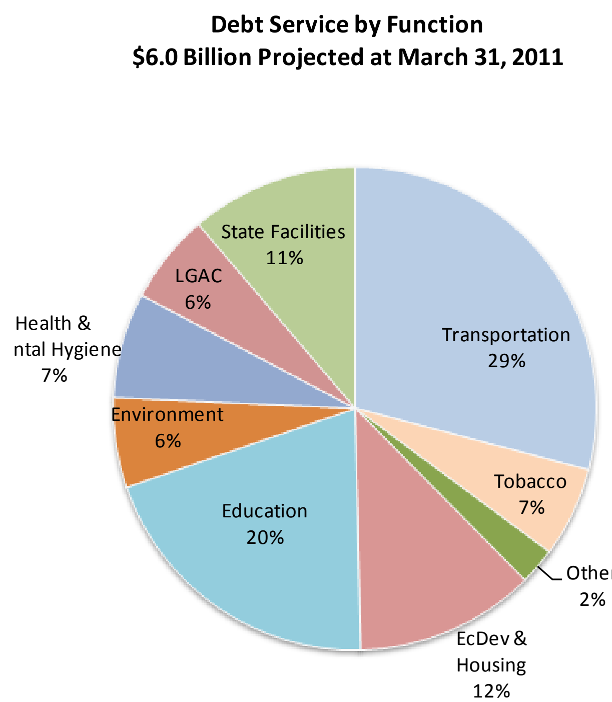
While program volatility is mitigated by the use of historical trends to project future expenditures, large swings in claims and sudden environmental changes (e.g. a high profile child abuse case that prompts additional reporting and the impact of the current economic climate on local district spending patterns) are difficult to anticipate.

DEBT SERVICE FORECAST METHODOLOGY

PROGRAM OVERVIEW

The State issues new debt to fund short and long-term capital projects. The State currently expects to have $56.6 billion in outstanding debt at the end of 2010-11, with the largest amounts issued to finance construction and reconstruction of roads and bridges and for higher educational facilities for SUNY and CUNY. The debt service on this debt is projected at $6.0 billion in 2010-11. Debt service is comprised of principal, interest and related costs on bonds issued by the State and its public authorities. The costs include underwriter fees, rating agency costs, counsel fees, insurance costs, expenses of State debt issuers and bond issuance charges. Roughly 4.4 percent of the State's budget is spent on debt service costs. The major programmatic areas/purposes for State debt and debt service costs are summarized in the following pie charts:





DOB prepares a detailed five-year projection of State debt levels and related costs twice annually, including all the major areas of existing and planned debt levels. This information (the "Capital Program and Financing Plan") is available on the DOB website (www.budget.state.ny.us) and is provided with the Executive and Enacted Budgets and major data is updated quarterly with each Financial Plan Update.

OVERVIEW OF DEBT SERVICE FORECAST

The DOB uses a multi-faceted approach to forecast debt service costs as described in detail below. This includes forecasts for both fixed and variable interest rate costs and projections for the amount of new fixed and variable rate debt that is planned to be issued to finance capital projects over the next five year period.

The State makes annual payments of roughly equal amounts over the life of a bond-financing ("level debt service"), similar to the repayment terms of a typical home mortgage. Therefore, the State's annual costs for an individual bond financing generally remain the same each year until the debt is retired, with greater interest payments occurring in the earlier years and greater principal payments in the later years.

Many consider debt service to be a "fixed" cost. In reality, debt service costs can change relatively quickly, and are affected by legislation that determines both the size of capital projects and whether the capital projects will be debt-financed (which drives future debt service costs) or "pay-as-you-go" where current resources are used to finance capital spending and no debt service costs result. For example, in the current fiscal year, virtually the entire amount of State-related debt service is for the payment of bonds issued in prior years. By 2014-15, based on the current forecast, that share will drop to 78 percent of the projected State debt service in that year. To a lesser extent, debt service costs fluctuate due to the impact of refundings (which lower existing debt service costs), movements in interest rates for variable rate debt, changes in the demand for State debt, and other market dynamics. In current market conditions, variable rates in particular have significant volatility.

The debt service forecast is comprised of two distinct, but related, components (1) the costs for debt obligations that have already been issued and (2) the projected new debt service costs for bonds that have yet to be issued to finance capital projects authorized by legislation. The debt service forecast is less likely to vary significantly for debt that has already been issued, and more subject to change for debt that has not yet been issued. The different factors affecting each category are summarized below.

OVERALL DEBT SERVICE FORECAST

DOB currently forecasts total debt service costs from 2010-11 through 2014-15 as summarized in the following table.

PROJECTED DEBT SERVICE COSTS* (millions of dollars)	Actual 2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
Grand Total Debt Service	**$5,626**	**$6,006**	**$6,631**	**$6,946**	**$7,106**	**$7,103**
State-Supported	**$4,962**	**$5,471**	**$6,039**	**$6,354**	**$6,515**	**$6,515**
Debt Service on Existing Debt	**$4,962**	**$5,460**	**$5,632**	**$5,476**	**$5,243**	**$4,956**
Fixed (Incl. Fixed Swaps)	$4,912	$5,411	$5,590	$5,443	$5,210	$4,925
Variable Rate Obligations	$50	$48	$42	$33	$33	$31
Projected New Debt Service	**$0**	**$11**	**$407**	**$878**	**$1,271**	**$1,560**
State Related	**$665**	**$535**	**$591**	**$592**	**$591**	**$587**
Tobacco Bonds	$518	$395	$451	$453	$455	$457
Secured Hospitals	$78	$82	$82	$82	$82	$82
All Other	$69	$58	$58	$56	$54	$49

Reflects State-supported debt service estimates in the 2010-11 Mid-Year Update

Debt Service Forecast – Existing Debt

For debt that has already been issued, there are only a few factors that can cause the debt service costs to vary from projections, and such variations are relatively modest:

Fixed Rate Debt. Fixed rate debt represents the largest category of debt service costs. It accounts for $5.6 billion of the State's $6.0 billion of State-supported debt service costs in 2011-12.

Variable Rate Obligations. Another potential variance from the forecast for existing debt is that actual interest rates will vary on the net variable rate obligations of the State. Such variable rate costs include the basis risk on interest rate swaps. The variable rate debt service costs are projected to total $42 million in 2011-12 based primarily on a projected 3.25 percent tax exempt interest rate.

Debt Service Forecast – New Debt

Some aspects for projecting new debt service costs are relatively clear, including the amount of debt that is statutorily authorized to be issued and the total amount of bond-financed capital spending that is statutorily authorized to be spent.

But some aspects are less clear until more specific information becomes available about the authorized capital projects, including:

- Whether certain types of capital projects are eligible for lower cost tax-exempt financing or require more expensive taxable financing.

- The length of time the debt will be outstanding (e.g., 10 years or 30 years), which is primarily determined by the useful life of the projects being financed.

- The timing of annual spending for each of the approved capital projects which typically “ramp up” over a multi-year period (e.g., the State is still spending for general obligation capital projects approved by the voters in the 1980s).

New debt service for bonds sold after October 31, 2010 is projected to total $11 million in 2010-11 growing to $407 million in 2011-12. The specific projections are based upon the amount of new capital spending and the timing of bond sales as summarized in the following table.

NEW DEBT SERVICE COSTS
(millions of dollars)

	2010-11	2011-12
Transportation	0	110
State Buildings/Facilities	11	108
SUNY/CUNY/Education	0	98
Economic Development	0	41
All Other	0	50
Total	**11**	**407**

The following provides a “real world” example of the debt service forecast for one enacted bond-financed capital spending program. Over the next three fiscal years, the State’s Capital Plan assumes the issuance of $802 million for prison facilities. After consultation among the staffs of DOB, the Department of Correctional Services and the Empire State Development Corporation, a forecast for the timing of the capital spending was developed. The annual debt service costs were based on the State’s interest rate forecast (see details below), as summarized in the following chart. Since this program was for a government purpose, it could all be financed with tax exempt bonds. Because of the long-term useful life of prison facilities, the debt could be issued for a 30-year term. The forecast projects that the 2010-11 bond sale will take place in December, 2010 and that the first debt service payment will begin in March, 2011.

	Timing of Spending/ Debt Issuance ($ in millions)	Average Interest Forecast	DEBT SERVICE COSTS (PRISONS EXAMPLE) (millions of dollars) 2010-11	2011-12	2012-13	Total (over life)
2010-11	$261	5.30%	$5	$18	$18	$527
2011-12	$266	6.25%	N/A	$6	$20	$586
2012-13	$275	6.30%	N/A	N/A	$6	$586
Total	$802*		$5	$24	$44	$1,699

**Includes $786 million of capital project spending and $16 million estimated costs of issuance.*

This same model is used for all of the hundreds of capital projects that are included in the State's Five-Year Capital Program and Debt Financing Plan and are compiled in the reports contained in that plan.

Interest Rate Forecast

DOB forecasts interest rates for all State bond issues throughout the five-year Capital Program and Financing Plan. These rates are based upon – and consistent with – DOB's economic forecast of the Federal funds rate and other interest rates, including tax-exempt municipal long term rates, Treasury rates at various maturities, and short-term rates. DOB forecasts both State tax-exempt and taxable borrowing rates - both fixed rate and variable – across a variety of maturity terms. These rate forecasts are based upon various rate indexes from DOB's economic forecast. The following chart details DOB's interest rate assumptions through the current five-year capital plan period.

PROJECTED INTEREST RATES (SELECTED)
MID-YEAR UDPATE

	Maturity	2010-11	2011-12	2012-13	2013-14	2014-15
AAA-rated	**3**	2.00%	3.00%	3.50%	3.50%	3.50%
Revenue Bonds	**5**	2.50%	3.50%	3.90%	3.90%	3.90%
	7	3.35%	4.40%	4.75%	4.75%	4.75%
	10	4.10%	5.10%	5.50%	5.50%	5.50%
	15	4.40%	5.40%	5.75%	5.75%	5.75%
	20	4.70%	5.70%	5.90%	5.90%	5.90%
	25	5.00%	6.00%	6.05%	6.05%	6.05%
	30	5.30%	6.25%	6.30%	6.30%	6.30%
	10 TX	5.70%	6.80%	7.00%	7.00%	7.00%
	Variable Rate TE	2.30%	3.25%	3.40%	3.70%	3.70%
	Variable Rate TX	1.55%	3.80%	4.70%	5.15%	5.20%
	LIBOR (one month)	1.45%	3.70%	4.60%	5.05%	5.10%

Timing of Capital Spending and Bond Sales

DOB's bond issuance projections are based upon the capital spending estimates for bond-financed programs. These capital spending amounts, as also detailed in the Capital Program and Financing Plan, are undertaken in a variety of programmatic areas, including transportation, education, and economic development. The capital spending estimates are based upon the expected timing of projects based on input from the associated State agencies, public authorities, legislative fiscal staff and program sponsors.

Taxable vs. Tax Exempt Financing

Since tax-exempt financings and/or Federally-subsidized taxable Build America Bonds (BABs) result in the lowest costs of borrowing, the State always seeks to maximize the amount of debt that can achieve this consistent with IRS guidelines. Investors require less interest on tax exempt bonds, since the interest income paid to them is exempt from Federal, State and/or local taxes. BABs are taxable bonds, whereby the State receives a 35 percent Federal interest subsidy. Since traditional taxable bonds are subject to taxes and do not enjoy a subsidy, investors demand - and the State pays - commensurately higher interest rates.

Consistent with IRS regulations, debt issued for a public benefit and use (e.g., roads, parks) can be issued either as tax exempt or as a BAB. In contrast, debt financings that provide a benefit to a private company (e.g., private use) are traditional taxable bonds. For example, loans or grants made to businesses for economic development purposes may benefit a private corporation, thereby requiring taxable financings.

Bond Maturities

State-related debt is issued with maturities based upon the useful life of the capital project being financed, with a maximum term of 30 years for tax exempt debt and 10 years for traditional taxable borrowings. The maturities vary for each bond sale depending on the specific component programs and projects that are being financed. Generally, debt maturities for ongoing projects are as follows:

- Transportation – 20 years
- Higher Education (SUNY and CUNY) - 30 years
- Mental Health – various up to 30 years
- Environment – 20 years
- Correctional Facilities – 30 years
- State office buildings and other facilities – primarily 20 years
- Housing programs - 30 years
- Economic development – various up to 20 years
- Equipment purposes – generally 3 to 5 years
- Taxable debt (non-BAB) - maximum term – 10 years

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VARIATION IN FORECAST

As discussed previously, only a relatively small portion of the State's debt service spending forecast is subject to change since most of the costs are based on debt that has already been issued in a fixed rate mode. However, over time, bonds that are projected to be issued comprise a growing portion of the State's debt service spending.

The two key elements that have the greatest potential to result in variances from the projected annual level of debt service costs are (1) the timing of new capital spending in each fiscal year, and the resultant timing and amount of new bond sales and (2) the interest rate forecast, including whether rates are above or below projected levels, with the most immediate impact felt on variable rate bonds.

In terms of the interest rate forecast:

- An increase or decrease of one percent in variable interest rates from DOB's current forecast (from 3.25 percent to either 2.25 percent or 4.25 percent for tax exempt debt) would result in a $30 million variance from 2011-12 projections.

- The impact of a consistent one percent change from DOB's projected fixed interest rate forecast (for example, from 6.25 percent to either 5.25 percent or 7.25 percent for 30-year tax exempt debt in 2011-12) has a cumulatively larger impact with each subsequent fiscal year – from $26 million in 2011-12 to $117 million by 2014-15.

PERSONAL SERVICE FORECAST DISCUSSION

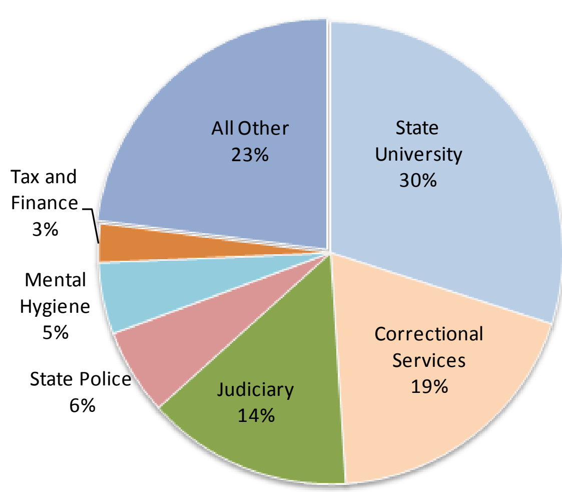
OVERVIEW

Personal service costs primarily include salaries of permanent State employees of the Executive, Legislature, and Judiciary, as well as overtime payments and costs of temporary and hourly paid employees. The costs also include uniform allowances for correctional and police officers, accrued vacation payments made upon separation from State service, and stipends.

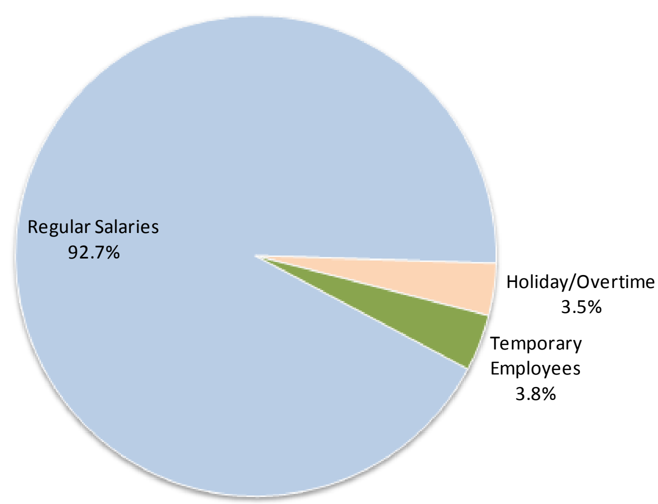
In 2010-2011, 12.6 percent of the State Operating Funds Budget is projected to be spent on personal service costs and supports roughly 79,100 full-time equivalent (FTE) employees under direct Executive control and another 17,000 employees of the Legislature and Judiciary.[1] Over the past decade, personal service spending has increased at an average annual rate of 4.9 percent on a State Operating Funds basis. Roughly three-quarters of all personal service spending occurs in five agencies: the State University of New York, the Department of Correctional Services, Judiciary, Division of State Police, and the Mental Hygiene agencies.

The following charts provide summary data on the shares of the actual 2009-10 State Operating Funds personal service spending totaling $10.9 billion by agency and category of spending.

2009-10 Personal Service Spending by Agency



2009-10 Personal Service Spending by Category



[1]. All State Operating Funds employees total roughly 126,600 FTEs.

PERSONAL SERVICE

The State's workforce is paid on a bi-weekly basis, weekly pay cycles that alternate between Administrative and Institutional payrolls. Employees of State-run Correctional, Health, Mental Hygiene and Education Department facilities comprise the Institutional payroll, while all other employees are included in the Administrative payroll. The vast majority of the State workforce is represented by one of the nine unions representing employees in 14 bargaining units ranging from university professors to State Police officers. Salary increases pursuant to collective bargaining contracts are the single largest factor influencing changes in the personal service forecast. Other factors that impact the personal service forecast are salary adjustments (i.e., performance advances, longevity payments and promotions), changes in workforce levels, and overtime requirements. Each of these areas is described in more depth below.

The personal service forecast also includes consideration of the number of positions to be filled or vacated in a given year and the timing of those changes (i.e., whether a position is filled in May or January). In addition, consideration is given to the grade level changes associated with these workforce changes (i.e., a vacant position may be filled by an employee at a lower/higher salary grade).

The following tables provide summary data on actual 2009-10 State Operating Funds personal service spending by agency and category of spending for State Operating Funds, as well as total FTEs by agency.

STATE OPERATING FUNDS
2009-10 PERSONAL SERVICE SPENDING BY AGENCY
(millions of dollars)

	Dollars	FTEs
State University	3,243	41,893
Correctional Services	2,111	29,714
Judiciary	1,537	16,821
State Police	647	5,704
Mental Hygiene	588	13,187
Tax and Finance	306	5,263
Public Health	241	4,505
Children and Family Service	172	3,118
All Other	2,029	27,255
Total PS Spending	**10,874**	**147,460**

STATE OPERATING FUNDS
2009-10 PERSONAL SERVICE SPENDING BY CATEGORY
(millions of dollars)

Regular Salaries	10,083
Holiday/Overtime	382
Temporary Employees	409
Total PS Spending	**10,874**

FACTORS AFFECTING THE PERSONAL SERVICE FORECAST

The main factors affecting the personal service forecast include negotiated salary increases, other salary adjustments (including longevity pay, performance advances and promotions), overtime pay, and changes in the size of the workforce, as described below.

STATE OPERATING FUNDS PROJECTED PERSONAL SERVICE SPENDING (millions of dollars)					
	2009-10	**2010-11**	**2011-12**	**2012-13**	**2013-14**
State Operating Funds	10,874	10,270	11,260	11,123	11,273
Annual Dollar Change		(604)	990	(137)	150
Annual Percent Change		-5.6%	9.6%	-1.2%	1.3%
Factors Impacting Forecast		**(604)**	**990**	**(137)**	**150**
Salary Adjustments (1.0 percent of base salary)		109	103	113	111
Retroactive Component of Labor Settlements		(248)	(22)	0	0
Reserve for Future Labor Settlements		12	334	(204)	0
Corrections		(37)	23	2	3
SUNY		(127)	55	(126)	(5)
State Police		(16)	(3)	(2)	(3)
Mental Hygiene		(55)	443	63	4
Judiciary		(15)	99	26	39
Other State Funds Reduction for Spending Trends		(160)	0	0	0
All Other		(66)	(41)	(9)	1

Negotiated Salary Increases/Reserve for Future Labor Settlements

Approximately 94 percent of the State workforce is unionized. The largest unions include the Civil Service Employees Association (CSEA), which primarily represents office support staff and administrative personnel, machine operators, skilled trade workers, and therapeutic and custodial care staff; the Public Employees Federation (PEF) which primarily represents professional and technical personnel (e.g. attorneys, engineers, nurses, accountants, social workers, and institution teachers); United University Professions (UUP) which represents faculty and non-teaching professional staff within the State University system; and the New York State Correctional Officers and Police Benevolent Association (NYSCOPBA) which represents security personnel (correction officers, safety and security officers).

The most recent contract settlements with the State's major unions (CSEA, PEF and UUP) cover the period April 2, 2007 through April 1, 2011 (July 1, 2011 for UUP). The contracts include general salary increases of 3 percent annually through 2009-10 and 4 percent in 2010-11. The State will negotiate in good faith for new labor settlements with the remaining unsettled unions or those that have not had labor contracts through 2010-11. The Enacted Budget Financial Plan included estimated spending in 2010-11 to finance potential agreements with labor unions that have not yet reached settlements for the period from 2007-08 through 2010-11. Based on the status of negotiations and the timetable for ratification, it no longer appears likely than any spending for potential agreements will occur in the current year.

Salary Adjustments

Salary adjustments include performance advances which systematically raise an employees' salary annually from the initial "hiring rate" until the "job rate" is reached, which typically occurs over a 6 or 7 year period; longevity payments which increase the salary for employees who are at their job rate for more than 5 years and 10 years; and promotions. Based on an analysis of the future longevity and advance eligibility of all State employees on the payroll as of a point in time, the annual salary adjustments are forecast at an average annual growth rate of one percent of current payroll.

Workforce Savings Plan

DOB has begun implementation of legislative and administrative savings measures to reduce State agency operation spending. Actions to reduce spending include an early retirement incentive plan, hiring freezes, layoffs, eliminating positions through attrition, delaying planned hiring of staff, encouraging participation in the voluntary reduction in work schedule program, and enhancing controls for reducing overtime costs.

Change in Size of Workforce

Workforce growth is forecasted by utilizing projected authorized FTE fill levels. The current FTE forecast projects a stable workforce, with the exception of limited, planned growth in three agencies, as detailed in the table below:

STATE OPERATING FUNDS WORKFORCE*
ANNUAL GROWTH TRENDS

	2010-11	2011-12	Annual Change	2012-13	Annual Change	2013-14
SUNY	41,809	41,809	0	41,809	0	41,809
Correctional Services	28,874	28,974	100	28,974	0	28,974
Mental Hygiene	12,844	13,122	278	13,122	0	13,122
Tax and Finance	4,992	4,992	0	4,992	0	4,992
State Police	5,398	5,398	0	5,398	0	5,398
Public Health	4,227	4,227	0	4,227	0	4,227
Children and Family Services	2,914	2,914	0	2,914	0	2,914
Environmental Conservation	2,301	2,301	0	2,301	0	2,301
Parole	1,893	1,893	0	1,893	0	1,893
All Other	21,325	21,325	0	21,325	0	21,325
Total FTEs	**126,577**	**126,955**	**378**	**126,955**	**0**	**126,955**

** Excludes Legislature and Judiciary*

Projections for authorized fill levels are based on an agency by agency analysis that includes whether State-run facilities are planned to expand or contract through either the addition of a new facility to serve a growing population or consolidation of existing facilities to optimize service delivery, whether program commitments will require a greater or lesser degree of staffing to meet service delivery needs, and whether it is more cost effective to hire State staff instead of consulting services which would lower NPS costs but increase State payroll and fringe benefit costs.

In 2011-12, the workforce is expected to increase modestly by year-end and is primarily due to actions impacting institutional programs. Specifically, increasing census for the SOMTA program, which results in more individuals being civilly confined in OMH-operated facilities, is expected add 224 positions; the multi-year closure plan to convert all of the State's OPWDD Developmental Centers to community-based settings by 2014 will add 46 positions; and the planned opening of a second Residential Mental Health Unit in July 2011, expanding mental health programs associated with a private settlement agreement and staffing the new central pharmacy located in Oneida county, will add 100 positions for DOCS.

Overtime Costs

In addition, overtime costs are also taken into consideration based on prior agency specific experience. Overtime costs comprised 3.3 percent of the State Operating Funds personal service spending in 2009-10. Over three-quarters of overtime costs were generated by the Department of Correctional Services, SUNY and mental hygiene agencies as detailed in the table below. Statewide, overtime costs were up by 6 percent from 2008-09 to 2009-10, primarily in the Department of Correctional Services.

STATE OPERATING FUNDS
OVERTIME
(millions of dollars)

	2008-09	2009-10
Correctional Services	128	152
SUNY	48	50
Mental Hygiene	52	48
Judiciary	39	36
State Police	25	27
All Other	46	45
Total Overtime	**338**	**358**
Annual Change		**5.92%**

OVERVIEW OF THE WORKFORCE COST PROJECTION TOOL (WCPT)

To support the analysis of the above factors that influence annual payroll projections, DOB uses an automated system, the WCPT. The WCPT projects future salary requirements for existing State employees for use by agency fiscal officers in the development of their personal service budget requests and by budget examiners in the development of their personal service budget recommendations.

The WCPT projects future salary costs for existing State employees from a payroll file that is produced by the Office of the State Comptroller's (OSC's) payroll system. The projection methodology related to the various salary cost components is discussed in more detail below.

Annual-Salaried Employee Salary Projections

The WCPT projects annual-salaried employee costs by calculating the future salaries of each annual-salaried employee listed in the base payroll and aggregating the results. The system does this by using the full time annual salary that appears in the base payroll file as its starting point, and adding planned salary increases, performance advances, longevity payments and lump-sum payments where applicable. The addition of salary increases, including performance advances and longevity payments, is dependent upon union contract provisions. No new salary increases are projected in 2011-12 and beyond.

"Additional" or "Other" Compensation

"Additional" or "other" compensation includes annual payments such as location pay, geographic differentials, and shift differentials, which are paid to employees in addition to their base salaries. Eligibility for various types of additional compensation depends upon a variety of factors including the bargaining unit to which the employee's position is assigned, the employee's work location, the employee's designated work hours and the nature of the employee's work responsibilities.

"Episodic" and "Non-Annual" Salaried Employee Costs

DOB began projecting "episodic" and "non-annual" salaried employee costs through the WCPT in 2009 for the 2010-2011 fiscal year. Episodic earnings are those earnings, such as overtime and standby pay that are not as predictable as other contract terms. These earnings are summarized into earnings categories, such as non-annual salaried employee costs, overtime and lump-sum payments, and then aggregated by agency, fund, account, program, bargaining unit and union over 26 pay periods.

Adjustments for Changes in Workforce Composition

DOB methodologies for projecting outyear annual salaries, additional compensation, episodic earnings, and non-annual salaried employee costs assume that there will be no change in the composition of the State workforce, such as new hires, separations, promotions, transfers, or position reclassifications or reallocations. Therefore, for a given budget year, adjustments must be made to the WCPT's projections for these changes as well as for suballocations to other agencies and planned increases to non-statutory salaries. These adjustments are typically made by agency fiscal officers and DOB examiners during budget development.

VOLATILITIES AND RISK

Volatilities inherent in the personal service forecasts include potential changes resulting from the contract negotiation process, the timing of fills/attritions and the related grade level changes, and overtime requirements.

SPENDING PROJECTIONS

The agencies experiencing the most significant growth in personal service are depicted in the chart below.

STATE OPERATING FUNDS PERSONAL SERVICE SPENDING (millions of dollars)	2010-11	2011-12	Annual $ Change	2012-13	Annual $ Change	2013-14	Annual $ Change
	10,270	**11,260**	**990**	**11,123**	**(137)**	**11,273**	**150**
State University	3,148	3,235	87	3,141	(94)	3,167	26
Correctional Services	1,898	1,940	42	1,961	21	1,984	23
Judiciary	1,537	1,651	114	1,694	43	1,750	56
Mental Hygiene	542	989	447	1,062	73	1,078	16
State Police	586	590	4	593	3	596	3
Tax and Finance	331	314	(17)	314	0	317	3
Public Health	251	258	7	264	6	270	6
Children and Family Services	175	170	(5)	174	4	169	(5)
Environmental Conservation	189	168	(21)	169	1	169	0
Legislature	165	168	3	172	4	175	3
Timing of Outstanding Labor Agreements	12	346	334	142	(204)	142	0
All Other	1,436	1,431	(5)	1,437	6	1,456	19

Personal service spending includes wages and compensation for overtime, holiday and temporary services. It does not include fringe benefits, which are accounted for under General State Charges. Personal service spending increases reflect the impact of settled labor contracts, salary adjustments for performance advances, longevity payments and promotions. Growth in personal service is affected by the expiration of enhanced FMAP, which temporarily reduced the State-share costs of operating the mental hygiene system; increased spending in SUNY hospitals due to SUNY Downstate Medical Center's acquisition of Long Island College Hospital; the costs of improved care and treatment for inmates with mental illness; and anticipated needs for Office of Court Administration.

NON-PERSONAL SERVICE FORECAST DISCUSSION

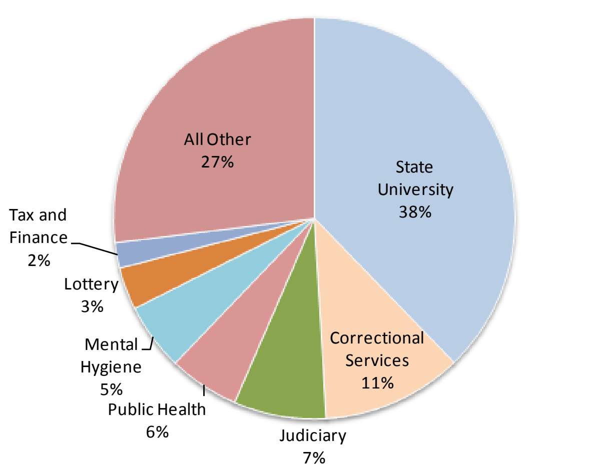
PROGRAM OVERVIEW

Non-personal service costs (NPS) represent certain operating costs of State agencies, including real estate rental, utilities, supplies and materials, equipment, telephone service, employee travel and contractual payments (e.g. consultants, information technology, and professional business services). Non-personal service spending in State Operating Funds is projected to be $4.6 billion in 2010-11.

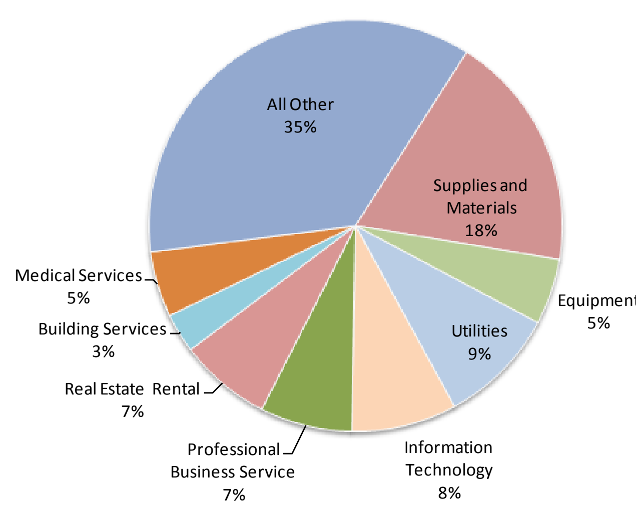
Roughly 5.7 percent of the State Operating Funds Budget is spent on non-personal service costs in 2010-11, a 2.1 percent increase over 2009-10. The agencies that run facilities typically have the highest NPS costs. Over the past decade, non-personal service spending has increased at an average annual rate of 2.7 percent. Roughly 70 percent of all NPS spending occurs in six agencies: the State University System, the Department of Correctional Services, Judiciary, the Department of Health, the Office of Mental Health, and the Division of the Lottery.

The following charts provide summary data on the shares of 2009-10 SOF NPS spending totaling $4.5 billion by agency and category of spending.

2009-10 Non-Personal Service Spending by Agency



2009-10 Non-Personal Service Spending by Category



The largest components of non-personal service spending vary by individual agency. For instance, NPS spending by the Department of Corrections is weighted heavily towards costs for health care (16 percent), utilities (15 percent) and supplies and materials (42 percent), including food provided to inmates at correctional facilities. In contrast, the Department of Tax and Finance is more heavily weighted towards information technology (23 percent) and mailings (17 percent).

The largest factors influencing the non-personal service forecast are inflation and changes in program activity. The Division of Budget forecasts 34 detailed price series specifically for the purpose of forecasting the non-personal service expenditure component of the State Budget. The inflation factors are discussed in more detail later.

The following tables provide summary data on 2009-10 NPS spending by agency and category of spending for SOF.

2009-10 NON-PERSONAL SERVICE SPENDING BY AGENCY
(millions of dollars)

	State Operating Funds	Share of Total
State University	1,706	38%
Correctional Services	509	11%
Judiciary	336	7%
Public Health	256	6%
Mental Hygiene	245	5%
Lottery	155	3%
Tax and Finance	92	2%
Children and Family Services	85	2%
State Police	81	2%
All Other	1,051	23%
Total	**4,516**	**100%**

ACTUAL NON-PERSONAL SERVICE SPENDING BY CATEGORY (millions of dollars)	2008-09	2009-10
Contractual Services	3,423	3,256
Utilities	461	355
Information Technology	342	338
Professional Business Service	310	312
Real Estate Rental/Leases	329	340
Building Services	200	184
Medical Services	212	224
Shipping and Printing Services	107	100
Centralized Services	87	84
Advertising Services	86	70
Communications	85	63
Conference/Training	40	77
All Other	1,164	1,109
Supplies and materials	914	816
Equipment	319	237
Indirect Costs/Special Department Charges	160	118
Travel	109	88
Total	**4,925**	**4,516**

SPENDING PROJECTIONS

The agencies that are projected to experience the most significant non-personal service growth over the next three years are depicted in the chart below.

STATE OPERATING FUNDS NON-PERSONAL SERVICE SPNDING (millions of dollars)	2010-11	2011-12	Annual $ Change	2012-13	Annual $ Change	2013-14	Annual $ Change
	4,613	**4,790**	**177**	**4,889**	**99**	**5,075**	**186**
State University	1,764	1,821	57	1,742	(79)	1,798	56
Correctional Services	515	528	13	560	32	602	42
Judiciary	364	390	26	413	23	439	26
Public Health	237	240	3	246	6	256	10
Mental Hygiene	211	224	13	271	47	279	8
Lottery	144	148	4	147	(1)	150	3
Children and Family Services	102	109	7	113	4	117	4
Tax and Finance	95	94	(1)	94	0	96	2
Debt Service	92	92	0	92	0	92	0
Insurance	72	77	5	78	1	79	1
All Other	1,017	1,067	50	1,133	66	1,167	34

Spending is expected to grow by an average of 3 percent annually through 2013-14, and is concentrated in agencies with large operational facility-based budgets. Significant cost increases are expected for food, prescription drugs, and energy costs in State facilities (including prisons, youth facilities, and mental hygiene facilities); increased spending in SUNY hospitals due to SUNY Downstate Medical Center's acquisition of Long Island College Hospital; costs for developing the new Statewide Financial System; and targeted initiatives including increasing staff-to-youth ratios and improving mental health services for youth residing in State-operated juvenile justice facilities.

FORECASTING METHODOLOGIES

DOB provides forecasts for 34 detailed price series specifically for the purpose of forecasting the NPS expenditure component of the state budget. This set of forecast variables includes price deflators for medical equipment, office equipment, office supplies, energy-related products, business services and real estate rentals. In most cases, detailed producer price indexes (PPI) or consumer price indexes (CPI) are used to represent the price deflators of these variables. For example, for the home heating oil price deflator, the home heating oil component of the PPI is used.

The primary data source for CPI and PPI data is the U.S. Department of Labor Bureau of Labor Statistics (BLS), which releases updated data each month. When there is no CPI or PPI component that closely matches the required price concept, an appropriately chosen price deflator from the National Income and Product Accounts (NIPA) data is used. For example, the personal consumption expenditure price index for telephone and telegraph from NIPA data is used for the price deflator of telephone. The NIPA data are provided by the U.S. Department of Commerce Bureau of Economic Analysis (BEA) and is updated on a quarterly schedule. However, BEA's quarterly estimates are based on data compiled generally monthly by BLS, the U.S. Department of Commerce Census Bureau, and BEA itself. For two variables -- government purchase of computers, and information processing equipment and software -- nominal spending growth is projected rather than price growth alone, since the available price series are adjusted for changes in quality. When product quality is changing rapidly due to technological advances, the use of a quality-adjusted price series to project spending growth can be very misleading.

DOB converts the monthly and quarterly variables referred to above to fiscal year frequencies, and then regression models are used to forecast them. Forecast variables from DOB's U.S. macroeconomic model are used as explanatory variables.

MODEL EXAMPLES

The details of model construction vary with type of model and its application, but a common process can be identified: generating a model and then checking the model for accuracy (sometimes referred to as diagnostics). The diagnostic step is important because a model is only useful to the extent that it accurately mirrors the relationships that it purports to describe. We have provided two examples of model construction and diagnostics below.

PRICE DEFLATOR FOR MEDICAL EQUIPMENT	
$\Delta \ln CPIUEMB = -0.0088 + 8.0222\Delta \ln CPIMED - 6.2649\Delta \ln CPISVMED - 0.8066\Delta \ln CPIUEMA$	
(0.0060) (1.7382) (1.5267) (0.2432)	
$Adjusted\ R^2 = 0.8922$	
XCPIUEMB	Medical Equipment
CPIMED	CPI - Medical care
CPISVMED	CPI - Medical services
CPIUEMA	CPI - Drugs and medical supplies

The model for the medical equipment price deflator assumes changes in the price level of medical equipment are a function of the change in three related price indices. These price indices, or explanatory variables in this context, are the changes in price level in medical care (CPIMED), medical services (CPISVMED) and a measure of drugs and medical supplies (CPIUEMA). Changes seen in the log of medical equipment prices are positively related with changes in the log price of medical care and negatively related to changes in the log price of medical services as well as the log price index of both drugs and medical services. This model is able to explain nearly 90 percent of the variation in the change in medical equipment prices over the period in question.

PRICE DEFLATOR FOR COMMERCIAL ELECTRIC POWER	
$\Delta LnWPI0542NS = -0.0035 + 1.1921\Delta LnWPI054NS + U$	
(0.0008) (0.0208)	
$U_t = 0.1938U_{t-1} + \varepsilon_t$	
(0.0840)	
$Adjusted\ R^2 = 0.9568$	
WPI0542NS	PPI – Commercial Electrical Power
WPI054NS	PPI – Electrical Power

Changes in the price level of consumer electrical power are assumed to be a function of the change in the price index of the broad measure of electric power (WPI0542NS) and a lagged residual. This model is able to explain more than 95 percent of the variation seen in the price index of commercial power and is consistent with principle of parsimony, or a preference for as simple a model as feasibly possible.

The following tables provide the multi-year calculated NPS inflation factors that are used for the purpose of forecasting the NPS expenditure component of the state budget.

NPS INFLATION FACTORS BY STATE FISCAL YEAR
September 22, 2010

Object Code Description	Economic Description	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
Supplies & Materials								
Medical/Dental Lab	Medical equipment and supplies	0.35	0.96	1.09	0.75	0.99	1.02	1.07
Drugs/Prescriptions	Drugs and medical supplies	2.01	4.12	4.58	4.13	3.90	3.73	3.64
Other Supplies	State & Local GDP Intermediate Durable goods	2.66	0.66	0.48	0.94	1.16	1.46	1.64
Unleaded Regular Gasoline	Unleaded Regular Gasoline	-3.04	-15.00	11.40	3.37	2.30	1.76	1.69
Food & Beverage	Food	6.60	-0.65	1.28	1.69	1.91	2.03	2.07
Maintenance/Repair	Maintenance and repair construction	7.55	-2.59	6.20	2.24	2.15	2.35	2.26
Home Heating Oil	Fuel Oil #2 Home Heating Oil	9.98	-35.16	20.17	3.69	1.82	1.74	1.71
Office Supplies	Office supplies and accessories	4.61	-0.56	1.22	0.75	0.35	0.54	0.62
Books	Educational books and supplies	7.04	6.98	5.62	5.09	4.99	5.05	5.15
Facility Household Sup	Housekeeping supplies	5.33	2.23	0.22	1.12	1.58	1.82	1.93
Clothing	Clothing and Shoes	-0.43	0.99	-0.61	0.47	0.36	0.51	0.61
Motor Equipment	Motor vehicle parts	1.93	0.24	0.57	0.68	0.79	0.93	1.02
All Other Sup & Matls	State & Local GDP Intermediate Durable goods	2.66	0.66	0.48	0.94	1.16	1.46	1.64
Travel Services								
Travel	Lodging away from home (hotel)	-2.41	-6.69	2.73	2.34	2.89	3.19	3.41
Travel	Public transportation	6.73	-4.11	7.27	2.78	1.73	2.33	2.74
Contractual Services								
Real Estate Rental	Real estate rental	3.55	1.53	0.17	2.38	3.10	3.34	3.41
Electricity	Commercial Electric Power	5.65	1.59	3.20	2.39	2.07	2.02	2.01
Natural Gas	Commercial Natural Gas	13.83	-23.60	0.01	6.51	4.14	4.11	3.82
Equipment Maintenance	Other Service	4.05	1.96	2.81	3.42	3.58	3.63	3.64
Telephone	Telecommunication Services	1.94	0.91	-0.21	0.35	0.39	0.34	0.41
Leases	Real estate rental	3.55	1.53	0.17	2.38	3.10	3.34	3.41
Leases	Automotive equip. leasing	7.94	5.25	1.15	2.28	2.21	2.07	1.97
Other Utilities	Household Utilities	5.43	-2.08	3.68	3.08	3.59	4.06	4.42
Water	Water Supply and Sanitation	6.04	6.37	6.35	4.92	4.41	4.28	4.30
Building Repair	Maintenance and repair construction	7.55	-2.59	6.20	2.24	2.15	2.35	2.26
Sewage	Water Supply and Sanitation	6.04	6.37	6.35	4.92	4.41	4.28	4.30
EDP Telecomm	Telecommunication Services	1.94	0.91	-0.21	0.35	0.39	0.34	0.41
All Other Contract Svc	Other Service	4.05	1.96	2.81	3.42	3.58	3.63	3.64
Postage & Shipping	State & Local GDP Intermediate Services	5.07	0.32	1.61	2.16	2.57	2.80	2.97
Printing Services	General job printing	1.75	-1.17	0.79	1.45	1.32	1.44	1.39
Equipment								
Personal Computer*								
IT Equipment - Other	Fixed investment in equipment excluding comp	2.25	0.33	-0.67	0.96	1.79	2.18	2.29
Vehicles	Average Price of New light vehicle	-4.29	4.60	4.95	2.84	3.07	3.28	3.40
Furniture	Commercial Furniture	6.04	1.30	2.25	2.53	2.67	2.88	2.99
Heavy Equipment	Construction machinery mfg	3.89	2.36	-0.83	1.24	1.82	2.02	2.04
Office Equipment	Office and store machines and equipment	8.50	-2.90	0.22	0.43	0.53	0.67	0.76
Medical/Health Equipment	Medical equipment and supplies	0.35	0.96	1.09	0.75	0.99	1.02	1.07
Comm. Network Equipment*								
All Other Equipment	Fixed investment in equipment excluding comp	2.25	0.33	-0.67	0.96	1.79	2.18	2.29
OGS Telecommunication	Telecommunication Services	1.94	0.91	-0.21	0.35	0.39	0.34	0.41
OGS Computer*								
PASNY Electric	Commercial electric power	5.65	1.59	3.20	2.39	2.07	2.02	2.01
Interagency Mail	CPI	2.72	0.31	1.13	1.76	2.13	2.31	2.39
Record Management Svcs	CPI	2.72	0.31	1.13	1.76	2.13	2.31	2.39
* See the Information Technology Section Below (blue shaded)								
Professional & Business Services								
Prof Business Svcs	Miscellaneous services	3.80	1.80	2.77	3.00	3.71	4.17	4.47
Legal Services	Miscellaneous services	3.80	1.80	2.77	3.00	3.71	4.17	4.47
Client Services	Miscellaneous services	3.80	1.80	2.77	3.00	3.71	4.17	4.47
Clerical Services	Miscellaneous services	3.80	1.80	2.77	3.00	3.71	4.17	4.47
Jury Services	Miscellaneous services	3.80	1.80	2.77	3.00	3.71	4.17	4.47
Subscription Services	Miscellaneous services	3.80	1.80	2.77	3.00	3.71	4.17	4.47
Memberships	Miscellaneous services	3.80	1.80	2.77	3.00	3.71	4.17	4.47
Accounting/Auditing	Miscellaneous services	3.80	1.80	2.77	3.00	3.71	4.17	4.47
Total Prof Bus Svcs	Miscellaneous services							

NPS INFLATION FACTORS BY STATE FISCAL YEAR
September 22, 2010

Object Code Description	Economic Description	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
Building Services								
Building Services	CPI all items	2.72	0.31	1.13	1.76	2.13	2.31	2.39
Building/Property Services	CPI all items	2.72	0.31	1.13	1.76	2.13	2.31	2.39
Security Services	CPI all items	2.72	0.31	1.13	1.76	2.13	2.31	2.39
Laundry/Linen Services	CPI all items	2.72	0.31	1.13	1.76	2.13	2.31	2.39
Total Bldg Services	CPI all items	2.72	0.31	1.13	1.76	2.13	2.31	2.39
Conf/Training Svcs	Tuition, other school fees	5.63	4.95	4.57	4.41	4.55	4.82	5.04
Advertising Services	Advertising agencies	0.82	-0.99	-0.53	0.03	0.66	0.92	1.09
Medical Services	CPI Medical service	3.71	3.35	3.24	3.44	3.84	3.95	4.03
All Other Services								
Other Services	Other Services	4.05	1.96	2.81	3.42	3.58	3.63	3.64
Interest Leases	Other Services	4.05	1.96	2.81	3.42	3.58	3.63	3.64
Interest Late Payment	Other Services	4.05	2.79	2.81	3.42	3.58	3.63	3.64
Highway Maintenance	Other Services	4.05	2.79	2.81	3.42	3.58	3.63	3.64
Interest Late Contracts	Other Services	4.05	2.79	2.81	3.42	3.58	3.63	3.64
Total All Other Svcs	Other Services							
Information Technology								
(forecasts represent total nominal spending growth rather than price growth)								
Personal Computer	Govt. Purchases of computers	-0.99	-2.00	8.69	5.51	2.75	0.94	0.22
Comm Network Eq	Information processing equip. investment	-0.81	1.16	12.50	9.78	8.33	7.09	6.30
OGS Computer	Govt. Purchases of computers	-0.99	-2.00	8.69	5.51	2.75	0.94	0.22
Info Technology Svcs	Information processing equip. investment	-0.81	1.16	12.50	9.78	8.33	7.09	6.30
IT Consultant Design	Information processing equip. investment	-0.81	1.16	12.50	9.78	8.33	7.09	6.30
IT Software License	Information processing equip. investment	-0.81	1.16	12.50	9.78	8.33	7.09	6.30
IT Software Install/Mtce	Information processing equip. investment	-0.81	1.16	12.50	9.78	8.33	7.09	6.30
IT Hardware Maintenance	Information processing equip. investment	-0.81	1.16	12.50	9.78	8.33	7.09	6.30
IT Other	Information processing equip. investment	-0.81	1.16	12.50	9.78	8.33	7.09	6.30
State wide NPS inflation**				2.37	2.39	2.58	2.71	2.78

**Spending weights are held fixed at their values for SFY 2009-10 to calculate the overall NPS inflation for SFY 2010-11 to 2014-15.

Price Deflators for School Years*		2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
	CPI all items	1.40	1.00	1.05	1.92	2.18	2.34	2.40
	Unleaded regular gasoline	-22.83	5.93	7.50	2.56	1.09	0.67	0.82
	Fuel oil #2 home heating oil	-22.29	-12.90	16.18	2.87	1.31	0.87	1.03
Long-term Real Estate Rental Growth Rate								
	10 years	41.35	39.14	34.27	31.43	30.87	31.57	32.34
	15 years	62.14	60.73	57.11	56.61	56.76	56.80	57.21
	20 years	90.14	85.65	78.45	76.88	78.24	79.86	81.60

* School year is defined as last 2 quarters of prior and first two quarters of current year.

Program Changes

The inflation factors are utilized in conjunction with program trends to determine overall NPS projections. These trends include whether State facilities plan to expand or contract to best deliver services, and whether it is more cost effective to provide services through competitive bidding, which drives NPS costs, or hire in-house staff that instead result in personal service and fringe benefit costs.

Volatilities and Risk

While actual results are available at a very detailed level of spending, based on current accounting system data roughly $1.1 billion (24 percent of total NPS spending) is reflected as “other services”. The State University System and Department of Health comprise 62 percent of other contractual spending as detailed below. As a result, the current Financial Plan projections are typically generated at a broader level of detail (e.g. NPS in total by agency versus detailed projections for equipment maintenance, utilities, business services, etc.). Inherent in this broader level of projection is the risk that generalized inflation factors may not be as accurate as the specific inflation factors applied to specific cost groups creating a risk of potential overstatement or understatement of non-personal service projections. In addition, non-personal service projections may be affected by timing, as the contract approval process may occur either faster or slower than assumed.

"OTHER CONTRACTUAL" SPENDING BY AGENCY
(millions of dollars)

	2008-09	2009-10
State University	541	550
Public Health	111	121
Environmental Conservation	51	41
Judiciary	36	35
Correctional Services	25	15
Higher Education Services Corp.	22	44
Education	19	20
Transportation	19	15
All Other	262	240
Total	**1,086**	**1,081**

EMPLOYEE HEALTH INSURANCE

PROGRAM OVERVIEW

Program Overview

Approximately 659,000 employees, retirees and their dependents are enrolled in the State's health insurance program. The number increases to over a million people if local government enrollees are included.

The State's share of health insurance premiums for employees and current retirees is 90 percent for individual coverage and 75 percent for dependent coverage. Employees and retirees contribute 10 percent and 25 percent for individual coverage and dependent coverage, respectively. However, the weighted average or "blended" contribution shares for the Empire Plan for both individual and dependent coverage result in **an 86 percent employer share and 14 percent employee/retiree share** -- after including all retirees and factoring in the value of the sick leave credit, where a retiree can use his/her unused sick leave credits to pay for part or all of his/her share of the health insurance premium. For retirees only, the employer share grows to more than 91 percent due to the sick leave credit described above and the fact that for pre-1982 retirees the State taxpayers pay 100 percent of the health insurance premium cost for individual coverage and 75 percent for dependent coverage.

The total 2010 annual cost to the State for health insurance is $5,100 for individual coverage and $10,800 for family coverage. For the 2011-12 fiscal year the State is expected to spend an estimated $3.4 billion for employee/retiree health insurance (including the health insurance costs of the Legislature and the Judiciary.)

Spending Trend

Since 1995, the State's cost of employee health insurance has grown dramatically, more than doubling in a ten year period with an average of 6 percent year-to-year growth over the past 5 years. These cost increases are attributed primarily to:

- The increased cost of health care generally, including prescription drugs;
- The extent of utilization by employees, retirees and dependents; and
- The type and level of benefits provided under the State’s health insurance plan, which for the most part are determined in collective bargaining with the State’s employee unions.

Current Challenges

The State will soon begin to negotiate new collective bargaining contracts with many of the state employee unions on health insurance and other benefits, as well as compensation. The outcome of these negotiations will shape the health insurance program and the fiscal impacts to the State.

A second major challenge involves implementation of a new accounting rule promulgated by the Governmental Accounting Standards Board (GASB). "GASB 45" requires the State and other public employers to report their post-employment health insurance liabilities for current employees and retirees starting in 2008. An actuarial analysis completed by Buck Consultants earlier this year estimated the State's liability at approximately $60.2 billion.

Although GASB 45 requires public employers to report their post-employment health insurance liabilities, it does not require pre-funding of those benefits. The State Health Insurance Council, consisting of the Director of Employee Relations, the President of the Civil Service Commission, and DOB, is continuing to evaluate long-term funding strategies for this liability.

Key Forecasting Data and Assumptions

The first step in forecasting employee health insurance costs for the Executive Budget begins in late summer/early fall with the establishment of Health Insurance premium rates for the coming year. The Department of Civil Service, in consultation with the Governor's Office of Employee Relations and DOB, negotiates the premium rates with various health insurance carriers. Negotiations are based on a review of current experience and trends, leading to a projection of increases in such factors as utilization, the cost of claims, administrative costs and the impact of regulatory costs. When negotiations with the carriers are complete, the rates are sent to DOB for final approval. New premiums typically take effect at the beginning of the calendar year.

Data on current and projected enrollments (employee and retiree) are provided by the Department of Civil Service, as the ongoing administrator of the Plan.

Another factor in projecting the costs is the impact of any changes to health benefit provisions that result from collective bargaining.

Spending Projections

Once the premium rates are approved, the employee health insurance costs for the new fiscal year can be estimated. The State's health insurance premium cost is calculated by multiplying the enrollment figures for active State employees and retirees, by the respective new premium rates for individual and family coverage. The active State employee enrollment is based on both the current workforce and any expected growth in the workforce. The retiree enrollment is based on current enrollment, adjusted for mortality rates and expected growth in the retiree population.

As part of the 2010-11 Enacted Budget, the cost of reimbursing retirees' Medicare Part B premiums are now included in the total premium cost for active employees and retirees. Formerly, the State paid 100 percent of the cost of reimbursing this premium. Under the current statute, although retirees continue to receive full reimbursement on a monthly basis, these charges are included in the premium cost and spread to all active and retired enrollees, consistent with the formulas described earlier in this document (retirees are reimbursed in full for their Medicare B premiums because Medicare is the first payer for retirees' medical costs, and thereby reduces the State's costs). Now employees and retirees contribute 10 percent for individual coverage and 25 percent for dependent coverage for the cost of these premiums. The costs of the State payment obligations under the sick leave credit program and the productivity enhancement program are added to the other components to generate the State's Employee Health Insurance estimate for the upcoming fiscal year. The sick leave credit and productivity enhancement programs allow retirees and active employees, respectively, to forfeit sick leave or vacation credit in exchange for reduced health insurance premiums.

The outyear forecasts are based on expected health insurance cost trends, utilization, and any expected enrollment changes that would result from anticipated fluctuations in the size of the State workforce. Every three or four years there may be additional increases or decreases to account for changes resulting from collective bargaining. The State and employee unions often agree upon changes to the design of the health insurance benefit that result in cost increases/decreases.

Risks and Variations to Forecasting Model

The risks and variations to the forecasting model are unforeseen changes in the workforce; changes in program costs as a result of collective bargaining agreements; changes in the healthcare industry as a result of new technology or medical protocols that may drive up costs; and health care utilization.

PENSIONS

PROGRAM OVERVIEW

Most State employees are members of the New York State and Local Retirement System, which consists of the Employees' Retirement System (ERS) and the Police and Fire Retirement System (PFRS). Depending on the System and the benefit "tier" to which an individual employee belongs, employee contributions may or may not be required. In all cases, however, the State must make annual payments to the System to fund the pension benefits that are promised to State employees. Although most State employees are members of ERS or PFRS, certain employees of the State University of New York, the State Education Department, and other agencies are enrolled in one of two other retirement systems: the New York State Teachers' Retirement System (TRS) or the Optional Retirement Program (ORP). Unless specifically stated, the process and dollar amounts stated in this document apply only to State employees enrolled in ERS and PFRS.

The State's payments (as well as payments by local government employers for their employees, and employee contributions) go into the Common Retirement Fund (CRF), which, as of June 30, 2010, was valued at approximately $124.8 billion. The CRF holds the assets of both ERS, the system for civilian State and local government employees, and PFRS, the system for State and local government police officers and firefighters. The State Comptroller is the sole trustee of both of these systems.

The dramatic stock market downturn that occurred during State fiscal year 2008-09 resulted in a precipitous drop in the value of the CRF from $158.8 billion to $110.9 billion. Though the CRF has partially rebounded since then, the substantial 2008-09 loss will still cause a significant increase in the employer contribution for 2011-12 and the projected employer contribution rates for 2012-13 and beyond. Previous market shifts have caused commensurate upward and downward shifts in the employer contribution rate. In the late 1990's, for example, the need for the State's annual pension payment was obviated by the extraordinary market returns of the Common Retirement Fund. Conversely, the stock market decline at the beginning of the current decade caused a dramatic increase in the State's annual pension payment. Significant benefit enhancements (including the "tier equity" enhancements, the elimination of the required three percent employee contribution by Tier 3 and Tier 4 employees after ten years of service and the implementation of cost of living adjustments) which were approved in 2000 also contributed to such increases. Chapter 504 of the Laws of 2010 enacted Tier 5 for employees hired after January 1, 2010 and will result in long-term savings for public employers.

KEY FORECASTING DATA AND ASSUMPTIONS

Pension estimates result from the interplay of the two factors that determine the State's pension contribution, namely:

- The employer contribution rates determined by the Office of the State Comptroller (OSC), which are based on factors such as life expectancies, estimates of when employees typically retire, and the performance of the Common Retirement Fund, which holds the assets of the New York State and

Local Retirement System. Employer contribution rates are set at the higher of an actuarially-determined rate based on the above factors, or a minimum contribution rate of 4.5 percent prescribed by law, as required by Chapter 49 of the Laws of 2003.

- Estimates of the State's salary base. These estimates begin with the current salary base and factor in known trends and planned changes, such as contractual salary increases resulting from collective bargaining and staffing changes associated with statutory or other mandates.

The employer contribution rates set by OSC are multiplied by the State's salary base to determine the State's annual pension contribution. This calculation is adjusted for other pension costs such as administrative costs, prior year reconciliations, any unique amortization costs and the Group Life Insurance Program.

Calculating the pension cost estimate begins in earnest when OSC releases the employer contribution rates for the upcoming fiscal year, typically in early September. At this point, the rates are multiplied by DOB estimates of the State salary base to project the budget year pension payment. This amount is later refined when the State receives the "October Estimate" from OSC. This estimate, which OSC is statutorily required to provide on October 15 each year, gives an in-depth analysis of the State's pension payment for the budget year and breaks down the various components of the payment, including normal costs, administrative costs, charges stemming from amortization of a portion of the State's 2004-05 and 2005-06 obligations, reconciliation charges, group life insurance charges, and other charges associated with enacted legislation. OSC is also statutorily required to provide an updated budget year estimate in December and February, although these estimates are usually unchanged from the October Estimate.

Although outyear pension payments are ultimately dictated by OSC, DOB staff work to anticipate changes by regularly monitoring the State's salary base and tracking the performance of the Common Retirement Fund. Tracking and forecasting the State's salary base is done by using information both from OSC and DOB and by keeping in mind any anticipated changes to the State's salary base, such as raises negotiated through the collective bargaining process or planned changes in the size of the State workforce. The Common Retirement Fund's annual performance is usually announced by OSC sometime after the end of each fiscal year.

Another factor that affects employer pension contribution rates is the use of the actuarial technique known as smoothing. Used to reduce the year-to-year fluctuations in employer contribution rates from volatile investment returns, this process measures assets by averaging the gains and losses of equity investments over a five-year period. The smoothing process used by OSC recognizes unexpected equity investment gains and losses at the rate of 20 percent per year for five years. As a result, the market performance in prior years can also affect employer contribution rates for an upcoming fiscal year.

Earlier this decade, a lag was built into the rate-setting process to increase the level of certainty when forecasting the budget year pension estimate. This lag calls for the employer contribution rates to be used when creating the State's annual pension bill to be based on the value of the Common Retirement Fund at the beginning of the previous fiscal year. For example, the employer contribution rates used to create the State's 2011-12 pension bill are based on the value of the Common Retirement Fund as of March 31, 2010. Prior to this change, each year's employer contribution rates were based on the value of the Common Retirement Fund at the beginning of the new fiscal year. (Had the change not been implemented, for example, the employer contribution rates for 2011-12 would have been based on the value of the Common Retirement Fund as of March 31, 2011.) Prior to this change, the exact amount of each year's pension payment was not finalized until sometime during that fiscal year, which added a significant amount of uncertainty into the forecasting process.

The 2010-11 Enacted Budget permits local governments and the State to amortize a portion of their pension costs beginning in 2010-11. Specifically, pension contribution costs in excess of the amortization thresholds, which are 9.5 percent for ERS and 17.5 percent for PFRS, may be amortized. The authorizing legislation also permits amortization in all future years if the actuarial contribution rate is greater than the amortization threshold, which may increase or decrease by no more than one percentage point for each year. Repayment of the amortized amounts will be made over a ten-year period at an interest rate to be determined by the State Comptroller. The assumed interest rate is 5 percent.

SPENDING PROJECTIONS

2009-10. The actual payment for 2009 was $989 million, an $87 million increase from the prior year.

2010-11. The Enacted Budget included legislation that allows the State to amortize a portion of its pension contribution costs. If the State chooses to exercise this option the actual payment for the current fiscal year is estimated to be $1,304 million. Without amortization, the payment is estimated to be $1,553 million.

2011-12. The October Estimate published by the State Comptroller effectively mandates the amount to be budgeted for the pension payment in the 2011-12 Executive Budget. It was received on October 15 and projects a 2011-12 State ERS and PFRS payment of $1,499 million, based on an amortized contribution rate and an estimated 3/31/12 salary base of $11.2 billion. If the State chooses not to amortize a portion of its contribution, the projected payment is $2,142 million. The increases in pension payments in both 2010-11 and 2011-12 are the result of substantial losses incurred by the Common Retirement Fund in 2008-09.

PENSION ESTIMATES (millions of dollars)	2009-10	2010-11	2011-12	2012-13	2013-14
ERS and PFRS	988.6	1,303.7	1,498.5	1,737.9	1,959.9

RISKS AND VARIATIONS FROM FORECASTING MODEL

A key feature of the State's defined benefit pension plan is the potentially volatile nature of the employer contribution rates that drive the amounts that the State and local governments are required to pay every year. Because these rates are largely affected by the performance of the stock market, a significant downturn in the market, such as the one that occurred during State fiscal year 2008-09, can lead to a large increase in the State's annual pension contribution. Although steps, such as the built-in lag described earlier, have been taken to give the State and local governments more advance notice of what their pension contribution will be, a downturn in the stock market can force the State and local governments to be responsible for large additional pension contributions.

Changes in the size and composition of the workforce, which work together to determine the salary base to which the rates are applied, also affect the pension obligation for a given year. Such changes may reflect modifications to programs and staffing patterns in response to new statutory mandates, outside certification requirements, recruitment and retention tools, or agency re-organizations.