Bureau of Finance

Forecasting Methodologies

Selected Revenues and Expenses

FY2024 Update

Prepared by the Office of the Chief Financial Officer

Contents

Introduction

Each quarter, the Office of the Chief Financial Officer (OCFO) develops a long-term financial forecast to evaluate potential fiscal challenges Cook County may face in the future. The OCFO utilizes a range of methodologies in forecasting county revenue sources as well as expenses. This document aims to provide an overview of the County's forecasting methodologies for several revenue sources in the General Fund as well as expenditure categories. Over time, the OCFO will work towards expanding the number of revenue sources covered in this report, as well as updating the report to reflect new or revised forecasting methods.

In October 2018, the Cook County Board of Commissioners approved an ordinance establishing the Independent Revenue Forecasting Commission (IRFC).[1] The IRFC is intended to help the Board of Commissioners make informed budgetary decisions by evaluating an annual five-year forecast of Cook County revenues. In FY2022, the IRFC recommended that the OCFO publish a document explaining General Fund revenue forecasting methods and data sources for assumptions for several key revenue sources.[2] This report provides this documentation, including explanations of statistical methodologies and qualitative assumptions used in the long-term forecasting.

[1] Ordinance 18-2073, https://cook-county.legistar.com/LegislationDetail.aspx?ID=3336038&GUID=3819EFE7-B095-44FF-B866-A2542871A0ED
[2] Recommendations of the IRFC 2022, https://cook-county.legistar.com/View.ashx?M=AO&ID=122136&GUID=c78f5d65-0cb5-496c-99c7-fc713b232094&N=UmVjb21tZW5kYXRpb25zIG9mIHRoZSBJUkZDIDguMjkuMjAyMi5wZGY%3d

Revenues

For revenue sources administered or collected by county departments, the OCFO collaborates with each department to develop and review revenue projections used in the County's General Fund forecast. This process first involves performing statistical extrapolations and/or regression analyses on all revenue streams within the General Fund. The first stage also entails considering any recent or potential administrative changes and pending or approved legislation which may impact revenues, so they can be properly accounted for in the forecast. Next, the OCFO reviews the analyses conducted and shares selected forecasts on each revenue stream with appropriate departments. Upon receiving feedback from departments on a recommended forecast to utilize in the overall General Fund forecast, the OCFO evaluates each department's recommendation along with all supporting documentation and data provided by the departments reinforcing their recommendation.

The following provides an overview of the specific methodology used for several revenue sources.

Sales tax

The Cook County sales tax accounts for approximately 53.4%, or $1,119.0 million, of the County's total General Fund revenues in FY2024. As of January 1, 2016, the County's sales tax rate is 1.75%.

Sales tax components and methodology

The County's home rule sales tax is forecast using a multiple linear regression that considers several economic indicators as well as other factors.

The overall strength of the sales tax regression model is evaluated by the R-squared value, which represents the percentage of variation in revenue that can be explained by the variables used. For instance, an R-squared value of 0.95 indicates that approximately 95% of sales tax revenue (the dependent variable) is explained by the changes in the explanatory variables considered in the model (the independent variables). In addition to considering the R-squared value, p-values for each independent variable are considered to ensure that each of the coefficients produced in the regression model have a statistically significant relationship to the sales tax. The regression model seeks to include only variables with statistically significant relationships to the sales tax, or p-values less than 0.05.

Seasonality

Retail sales tend to vary by month due to factors including the length of each month, weather, tourism, and holiday consumption. As a result, the sales tax forecast uses monthly observations to capture any seasonality when projecting revenues. Each month of the year, except the month of June, is included as an independent variable.

Time

Each month is considered a time period, in order to account for sales tax revenue trends over time varying from trends in economic factors.

Remote sales

Beginning January 1, 2021, the State of Illinois began requiring that out-of-state retailers charge Illinois consumers for all state and local taxes based on where the purchase is delivered. This policy change has continued to bolster the County's sales tax base. To account for this in the forecast, a dummy variable is used to factor in this change, including a 6-month phase-in period as compliance ramped up. The assumed 6-month period was determined by its impact on the statistical significance of the forecast.

Economic factors

The sales tax forecast uses several economic indicators for the Chicago-Naperville-Elgin Metropolitan Statistical Area as projected by Moody's Analytics. Specifically, the model integrates Moody's baseline scenario projections of real Gross Domestic Product and Consumer Price Index for the Chicago-Naperville-Elgin Metropolitan Statistical Area.

Regression coefficients for forecast, August 2023

Variable	Coefficient	*Sig.*
Intercept	-$6,993,661,035	**
Time	-$9,238,011	**
January	-$1,117,357,623	**
February	-$1,148,313,856	**
March	-$442,645,290	**
April	-$570,655,000	**
May	-$170,588,873	*
July	-$317,242,643	**
August	-$318,619,403	**
September	-$317,572,547	**
October	-$397,213,608	**
November	-$438,315,364	**
December	$431,222,687	**
Remote	$862,784,727	**
Gross Metro Product	$19,153,115	**
CPI: Total – All Urban Consumers, (Index 1982-84=100, SA)	$8,740,656	*

Significance: *$p < 0.05$, **$p < 0.01$

Accelerated payments

In addition, the County receives an accelerated payment—if applicable—every March from the Illinois Department of Revenue.[3] The accelerated payments are calculated using the average amount of the lowest 10 months of disbursements for the most recent calendar year (CY), minus the average amount of the lowest 10 months of disbursements for the CY prior to that. Below is an example of this accelerated payment calculation for CY 2024.

$$\text{CY2023 average lowest 10 months} - \text{CY2022 average lowest 10 months} = \text{March 2024 accelerated payment}$$

Based on the example above, if the CY2023 average amount for the 10 lowest months is greater than the CY2022 average amount for the 10 lowest months, the County will receive an accelerated payment in March of CY2024 equaling the difference between these CY2023 and CY2022 averages. The OCFO calculates these parameters using the monthly forecasted revenues to project any accelerated payments the County would receive in future years in addition to the projected sales tax disbursements.

[3] (55 ILCS 5/5-1006) (from Ch. 34, par. 5-1006) Sec. 5-1006. Home Rule County Retailers' Occupation Tax Law. https://www.ilga.gov/legislation/ilcs/ilcs5.asp?ActID=750&ChapterID=12

Property tax

The Cook County total property tax levy is made up of two basic components:

- Base property tax levy
- Revenue attributable to additional property value returning to the tax base

Base property tax levy

The County's base property tax levy is $720.5 million. This base levy amount was approved in 1996 by the County Board of Commissioners and it has remained flat at $720.5 million in subsequent years. The OCFO assumes this base levy will continue to remain flat in its out-year revenue forecast.

Incremental property tax levy increases

Regarding the second component, as TIF districts and incentives expire and new property through construction and economic activity is added, the County recognizes additional property tax revenue in its property tax levy. Increasing the levy in this manner does not increase the property tax burden on other Cook County taxpayers. That said, all else being equal, the burden may be shifted if properties are removed from the tax roll.

Estimating new property

The OCFO estimates the amount of revenue that can be added to the tax levy to account for new property and expiring incentives and TIF districts using data from the County Clerk's Taxing Agency Reports.[4] Unless they are extended, Cook County's incentive classifications phase out after ten years, and TIF districts expire after 23 years.

The *New Property Report* details the equalized assessed valuation (EAV) of all property within the district or agencies boundaries that is considered *new property* and *recovered tax increment value* under the Property Tax Code.[5] To calculate this part of the levy, the OCFO sums up the New Property Equalized Assessed Value, the Recovered Tax Increment Value, and the Expired Incentives amounts, and multiplies this sum by the Final Tax Rate from the *Agency Rate Report*.

Long-term estimates

For the out-year forecasts, the OCFO estimates how much new property can be added to the tax levy. For new EAV and expired incentives, it is assumed these will grow by taking an average of prior fiscal years and factoring in the projected growth rate for real GDP. For recovered TIF value, the OCFO estimates how many TIFs will be expiring each year using publicly available data from the County Clerk and the Illinois Department of Revenue. The OCFO sums up how much value will be recovered from TIFs by totaling the expiring EAVs for each year and then multiplying these sums by the forecasted Final Tax Rates for each corresponding year.

The OCFO also utilizes the projected growth rate for real GDP when estimating out-year tax rates for new property calculations. It is assumed that the overall tax base will grow with the economy, resulting in a proportionately lower property tax rate.

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[4] Cook County Clerk, Tax Agency Reports, https://www.cookcountyclerkil.gov/property-taxes/tax-agency-reports

[5] (35 ILCS 200/18-185) Property Tax Code. (n.d.). Retrieved February 14, 2023, from https://www.ilga.gov/legislation/ilcs/ilcs5.asp?ActID=596&ChapterID=8

Forecasting assumptions

The OCFO considers a range of gross domestic product (GDP) projections from financial organizations and institutions to project out-year Final Tax Rates, an input to the estimate of new property.

The OCFO also forecasts for loss in collections relating to property tax collections. A rate of 3%, which is based on historic amounts, is used in the calculation to project loss in collections. The loss in collections is eventually deducted from the gross tax levy, and the amount remaining is the net tax levy for the fiscal year.

Distribution

Property tax revenue is first allocated to:

- General Obligation Bond Debt Service
- the County's Statutory Pension Contribution, less Personal Property Replacement Tax revenue
- Election-related contributions
- Capital funds

Then, the forecast assumes that the County will continue allocating property tax revenues to the Health Enterprise Fund for the purposes of supporting the cost of the Department of Public Health as well as correctional health care. After these distributions are made, the remaining net tax levy is disbursed to the Public Safety Fund. Below is an overview of how property tax revenue was forecasted for FY2024:

Property tax overview – FY2024	Amount
Base property tax levy	$720,483,542
Estimated new property (current year)	
New TIF	$13,609,986
New Incentives	$347,539
New Property	$4,081,172
Total estimated new property (current year)	$18,038,698
Estimated new property (prior years)	$77,037,719
Total Gross Tax Levy	**$815,559,958**
Allowance for uncollected (3%)	$11,722,730
Distributions	
General Obligation Bond Debt Service	$259,630,924
Statutory Pension Contributions (less PPRT revenue)	$165,171,383
Election-related Contributions	$64,303,928
Capital Equipment funds	$0
Health Enterprise Fund	$157,704,920
Public Safety Fund	$157,026,073

Tax increment financing district surplus

Tax increment financing (TIF) is a financial tool that is used by governments to advance economic development that would not have occurred had incentives not been offered. If there are unused TIF funds in a district at the end of the year, a surplus can be declared by the municipality collecting tax revenue for the TIF district. This surplus is distributed back to the taxing agencies overlapping the TIF district, based on each agency's share of the property tax bill distribution within the TIF district.

The OCFO forecasts TIF surpluses accruing to the County's General Fund. The OCFO develops the forecast for TIF surplus based on the total estimated TIF surplus that will be declared by the City of Chicago. While the County also receives TIF surplus from other municipalities, the OCFO does not forecast these other surpluses as they are less predictable and comprised of a minimal portion of the revenues. The City of Chicago outlines how much TIF surplus it plans to declare in their annual *Budget Overview* report, which is a summary of the annual budget recommendation and is usually released in the fall.

The OCFO takes the total estimated TIF surplus that the City of Chicago expects to declare and multiplies that amount by the County's estimated distribution proportion based on tax extensions from the most recent tax year. The County Clerk issues an annual tax rate report outlining the distribution of tax dollars to taxing districts in the City of Chicago. The OCFO refers to the Clerk's report to confirm Cook County's updated portion of the distribution of taxes.[6] The following table outlines Cook County's portion of the tax distribution from previous tax years:

Tax Year	Cook County Portion	Date Release of Tax Report
2021	6.66%	Dec 05, 2022
2020	6.55%	Aug 19, 2021
2019	6.59%	Jun 29, 2020
2018	7.21%	Jun 20, 2019
2017	6.83%	Jun 20, 2018

The FY2024 TIF surplus was based on an estimated total surplus of $202 million, received prior to the release of the City of Chicago's 2024 *Budget Overview* document. Of the $202 million TIF surplus, Cook County's distribution would be approximately 6.66%, or $13,453,200.

$$\$202{,}000{,}000 \times 6.66\% = \$13{,}453{,}200$$

Note that while Cook County receives TIF surplus distributions from the City of Chicago each year, annual declared TIF surpluses are not guaranteed. For out-year TIF surpluses, the County uses a flat forecast of the average TIF surpluses from the prior five fiscal years. For example, the TIF surpluses forecasted for FY2025 and beyond are an average of the TIF surpluses from FY2020 through FY2024.

FY2020	FY2021	FY2022	FY2023	FY2024	FY2025 & Out-years
$21,756,338	$19,213,092	$13,538,232	$25,872,500	$13,453,200	$18,766,672

[6] Cook County Clerk, Tax Extension and Rates, https://www.cookcountyclerkil.gov/property-taxes/tax-extension-and-rates

Personal property replacement tax

The Personal Property Replacement Tax (PPRT) is a business income tax imposed by the State of Illinois and disbursed to local taxing districts. PPRT includes taxes on corporations, partnerships, trusts, S corporations, and on the invested capital of public utilities. Cook County's portion of the revenue disbursed statewide is 3.89%, and funds are distributed in January, March, April, May, July, August, October, and December.

To forecast revenue from these disbursements, the estimate provided by the State of Illinois for their fiscal year is used as a starting point.[7] The State's estimate incorporates their forecast for total PPRT revenues accruing to the state PPRT Fund, the State's appropriations of the PPRT Fund for specific purposes, deposits to the State's refund fund, and changes in annual reallocations. To integrate this estimate into the forecast, the County uses historical average proportions to estimate how the funds will be distributed across the 8 months that the state disburses PPRT . Because the State of Illinois fiscal year runs from July 1 through June 30, their FY2024 estimate only covers a portion of the County's December 1 through November 30 fiscal year. Therefore, this starting point needs to be adjusted to account for this difference. For example, the State includes a disbursement from their Refund Fund in fall 2023 in their FY2024 estimate. This amount excluded to ensure that the County is not forecasting it to come during the County's FY2024.

To forecast, the County increased this base PPRT disbursement annually assuming that it will follow trends in increases in national corporate profits, which have shown to be correlated with the county's PPRT disbursements over the past decade ($r^2 = .82$). Historical data from the U.S. Bureau of Economic Analysis' *National income: Corporate profits before tax (without inventory valuation and capital consumption adjustments)* was used to create a linear forecast for growth in PPRT revenues in the out-years. It is assumed that these revenues will grow between 2.6 % and 2.8% annually.

The County's PPRT forecast is also adjusted to account for the State's annual true-up adjustments of overall business income tax revenues that can result in funds moving between the PPRT Fund and other funds holding revenues associated with state income taxes. Historically, these adjustments have been minimal. However, in FY2024, approximately $818.4 million will be shifted from the PPRT Fund during the State's FY2024, resulting in a $31.9 million impact on the County's disbursement. The forecast assumes that the true-up adjustment would increase in the following state fiscal year 2025 and then decrease in the state fiscal year 2026. The forecast assumes minimal true-up adjustments in subsequent fiscal years.

PPRT revenues accrue to the Annuity and Benefit Fund and the General Fund. The County contributes PPRT disbursements to the Annuity and Benefit Fund in arrears, meaning that the disbursements received from the State of Illinois are being applied against the amount budgeted for the A & B Fund contribution in the County's previous fiscal year budget. Starting in FY2024, this contribution to the Annuity and Benefit Fund will be $40 million annually. The remainder of the revenues are deposited into the General Fund into the Non-Property Taxes account.

[7] Illinois Department of Revenue, Fiscal Year 2024 Estimate for Replacement Taxes, https://tax.illinois.gov/localgovernments/replacementtaxestimate/replacement24.html.

Tax Levy year/Fiscal year budget	2019	2020	2021	2022	2023
Year PPRT applied	2020	2021	2022	2023	2024
Budgeted PPRT	$44.5	$53.4	$50.9	$66.6	$40.0
PPRT disbursement	$54.2	$91.1	$183.9	$164.0	$113.2
Non-Property Taxes	$9.7	$37.5	$133.0	$97.4	$73.2

*in millions

Investment income

The County receives returns and interest on its financial investments. To calculate investment income, investible assets were multiplied by Moody's Analytics forecasted 2024 treasury rate of 3.90%.

To estimate income from investments, the forecast starts with the County's total investible assets. For the FY2024 forecast, it is assumed that investible assets will be equal to the projected General Fund balance, less a buffer equal to expected expenses for each month. The buffer includes salary, withholdings, debt service, pension contributions from the General Fund, as well as half of expected Health Plan Services revenues.

Start with the General Fund balance	$1,513.4 M
Remove a buffer	- $275.6 M
Starting balance less the buffer (investible assets)	$1,237.9 M

To ensure the forecast is consistent with past results, a factor is applied that reduces the investment income to a level, relative to the actual treasury yield, that was experienced during the first half of FY2023. The table below provides an example of how the factor is calculated for a historical month.

$\text{Factor} = \dfrac{\text{Actual investment income}}{\text{Investible assets } \times \text{Yield} \div 12}$	$\dfrac{\$2.2 \text{ million}}{\$1{,}237.9 \text{ million } \times 3.5\% \div 12} = 62.3\%$
Where:	
Actual 10-year Treasury Yield for the month	3.5%
Actual investment income revenue for the month	$2.2 million

The average of the monthly factors during the first half of FY23 is used to calculate revenue for each projected month. The following table shows the calculation for revenue for a future month.

$\dfrac{\text{Projected investible assets } \times \text{Projected yield} \times \text{Average factor}}{12} = \text{Projected revenue}$	
$\dfrac{\$1{,}525.8 \text{ million } \times 3.9\% \times 70.9\%}{12} = \$3.5 \text{ million}$	
Assumptions:	
Projected 10-yr Treasury Yield for the month	3.9%
Projected investible assets	$1,525.8 million
Average factor	70.9%

For FY2024, this results in a forecast of $43 million in revenue. When this revenue is compared to total investible assets, the result is an estimated effective yield of 2.8%.

For the long-term forecast, the data and methodology were broadened. In the long-term forecast, the starting point was the total cash balance for all funds, less the buffer. Then, the investment income for all county funds was estimated using Moody's projections for the treasury yield. This results in yields of 4.5% for the first half of 2024; 4.4% for the second half of 2024; 4.3% for 2025; and 4.5% for 2026-28. Then, a portion of this investment income was assumed to be directed to the General Fund, based on the proportion of total investment income for all funds to the investment income assigned to the General Fund in the first part of FY2023.

Expenditures

The County's expenditures were analyzed as falling into five primary categories. These categories are:

- Expenses that grow at or around the rate of inflation
- CountyCare medical claims estimated based on membership and claim costs
- Salary and Wages costs that are projected to grow in accordance with the rate negotiated in our Collective Bargaining Agreements
- Anticipated increases in health benefits

The OCFO considers the CPI projections published by Moody's Analytics, the Federal Open Market Committee, the Congressional Budget Office, the Federal Reserve Bank of Philadelphia, and The Wall Street Journal when developing a preferred CPI growth rate. The OCFO also reviews historical CPI data for the Chicago metropolitan statistical area and U.S. city averages for the categories of energy and medical care.

In the latest County forecast, the OCFO utilized an estimate provided by the Congressional Budget Office of the CPI to develop the estimated out-year growth in the following categories: contractual services and communication & IS maintenance within the General Fund; supplies and materials, operations and maintenance, energy, operating capital, and rental and leasing categories in both the General Fund and Health Enterprise Fund. These costs are expected to grow at an average rate of 2.3% annually. While contingencies in FY2024 are increasing significantly from FY2023 because of a change in how the County will contribute to the Annuity and Benefit Fund, this category is otherwise expected to grow at or around the rate of inflation.

The category of CountyCare medical claims is based on Managed Care claims and, more specifically, the anticipated reimbursements to our third-party care providers for services provided to foreign and domestic health care providers. Managed Care Claims expenses are anticipated to initially drop due to lower membership levels, but the losses in membership are eventually expected to be offset by anticipated increases in average claim costs, resulting in an overall annualized growth rate of 3.6%.

The OCFO utilized negotiated rates as outlined in the County's CBAs to project salaries and other personnel costs, which is estimated to increase at an average of 3.1% through FY2028. Health benefits in both the General Fund and Health Enterprise Funds grow in accordance with rates consistent with an analysis provided by the County's actuarial service provider in FY2024. After FY2024, health benefits rates are expected to grow with the average annual change in the Medical Care CPI, increasing at a CAGR of 3.4%. Pension Reimbursements were expected to remain flat.