NY State Tax Worksheets

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1 Explanation of NY state worksheets

1.1 Overview

The worksheets for NY state tax serve two purposes:

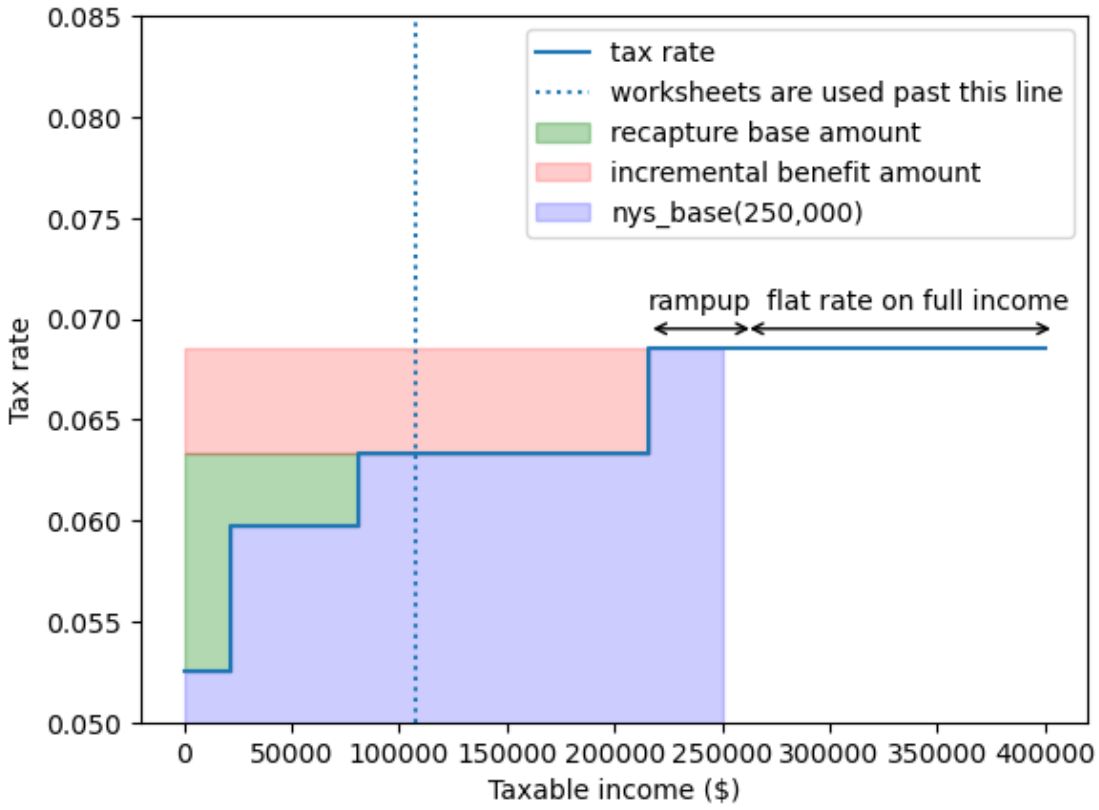
1. *Activate a flat tax*: above $107,650, the state of New York aims to impose a flat rate on the entire income instead of utilizing the progressive tax rates, except at the very beginning of the tax brackets.
2. *Tax cliff mitigation*: implementing a flat rate without adjustments would result in a substantial tax cliff at the onset of each new income bracket. For example, transitioning from 215,399 to 215,400 would incur an additional cost of 1,120 (for Single status). The worksheets addresse this issue by smoothing the cliff over the initial ~$50,000 of each tax bracket, referred to as the "ramp-up" zone.

To illustrate, let's examine a Single status taxpayer in New York for the 2021 tax year with a taxable income exceeding 215,400 but below 1,077,550

- We assume the adjusted gross income equals taxable income for simplicity, denoted as t.
- $nys\_base(t)$ represents the state tax without the worksheets logic.
- $nys(t)$ denotes the tax amount with the inclusion of worksheets logic.

If we were to apply a flat tax rate for a taxable income $t > 215400$ without considering ramp-up zone, it can be expressed as $0.0685 \cdot t$. As seen in the graph below this can be rewritten as $nys\_base(t) + recapture\_base\_amount + incremental\_benefit\_amount$ where:

The worksheets progressively applies the *incremental_benefit_amount* over the initial ~$50k of the bracket to smooth the tax cliff.



Here is the exact computation as done in worksheet 8 tax year 2021. 2022 is similar. (still assuming AGI is eqaul to taxable income):

- during the ramp-up zone $[215400, 215400 + 50,000]$,

$$nys(t) = nys\_base(t) + recapture\_base + \frac{t - 215400}{50000} \cdot incremental\_benefits$$

given that (expression used in 2021):

$$incremental\_benefits = 0.0685 \cdot t - nys\_base(t) - base\_recapture$$

Note that we also have (as done in 2022)

$$incremental\_benefits = (0.0685 - 0.0633) * 215400 = 1120$$

we can rewrite, as done in worksheet 8:

$$nys(t) = nys\_base(t) + base\_recapture + \frac{t - 215400}{50000} \cdot (0.0685 \cdot t - nys\_base(t) - base\_recapture)$$

- after the ramp-up zone, the tax is just

$$nys(t) = t * 0.0685 = nyst\_base(t) + base\_recapture + incremental\_benefits$$

1.2 Computation of recapture baase amounts

The magic numbers in the worksheets 8-11 (line 6) are the base_recapture amounts, and can be computed using only the brackets and tax rates as inputs:

[2]:
```
brackets_21 = [0, 8500, 11700, 13900, 21400, 80650, 215400, 1077550, 5000000,␣
 ↪25000000]
rates_21 = [0.04, 0.045, 0.0525, 0.059, 0.0597, 0.0633, 0.0685, 0.0965, 0.103,␣
 ↪0.109]

brackets_22 = [0, 8500, 11700, 13900, 80650, 215400, 1077550, 5000000, 25000000]
rates_22 = [0.04, 0.045, 0.0525, 0.0585, 0.0625, 0.0685, 0.0965, 0.103, 0.109]

threshold = 107650


def compute_base_recapture(brackets, rates):
    prev_rate = 0
    prev_base = 0
    bases = [0]
    for rate, b0, b1 in zip(rates[:-1], brackets[:-1], brackets[1:]):
        benefit = (rate - prev_rate) * b0
        base = prev_base + benefit
        if threshold < b1:
            bases.append(round(base))
        prev_base = base
        prev_rate = rate

    # benefits done here to match the rounding of the worksheets
    benefits = [b1 - b0 for b0, b1 in zip(bases[:-1], bases[1:])]
    return bases, benefits


print("2021 bases, benefits =", compute_base_recapture(brackets_21, rates_21))
print("2022 bases, benefits =", compute_base_recapture(brackets_22, rates_22))
```

```
2021 bases, benefits = ([0, 526, 1646, 31817, 64317], [526, 1120, 30171, 32500])
2022 bases, benefits = ([0, 536, 1829, 32000, 64500], [536, 1293, 30171, 32500])
```

If we set recapture baase for the worksheet 7 to 0 it would work as the other sheets.